MAYNOOTH STUDIES IN
CELTIC LINGUISTICS
I

TOWARDS A RELATIVE CHRONOLOGY OF ANCIENT AND MEDIEVAL CELTIC SOUND CHANGE

KIM McCONE

DEPARTMENT OF OLD AND MIDDLE IRISH
ST. PATRICK'S COLLEGE, MAYNOOTH
1996

MAYNOOTH STUDIES IN CELTIC LINGUISTICS I
Series Editor: Kim McCone

TOWARDS A RELATIVE CHRONOLOGY OF ANCIENT AND MEDIEVAL CELTIC SOUND CHANGE

by
Kim McCone

The Department of Old Irish
St. Patrick's College, Maynooth
1996

ISBN 0 901519 40 5
ISSN 1393 3395

Printed by
THE CARDINAL PRESS, MAYNOOTH

Foreword

The primary aim of the present book is to establish a relative chronology of the main sound changes that occurred on the way from Proto-Indo-European via Proto- and Insular Celtic to Old and Middle Irish. This inevitably entails examination of the relationships between the various members of the Celtic family, chapter three being chiefly devoted to this question. The role of the first chapter is the essentially introductory one of describing the idiosyncratic orthographical systems of the those Celtic languages that figure most prominently in the following five chapters. Chapters two to five follow a line some four millennia long from PIE to Early Medieval Irish. Since our knowledge of Continental Celtic remains rather inadequate despite dramatic and continuing improvements during the last four decades or so, a comprehensive relative chronology of Gaulish and Celtiberian does not yet seem practical. Instead various topics relevant to their phonological development are dealt with at suitable points in chapter three especially. Chapters four and five are mostly concerned with the relative chronology of the multitude of changes that affected Irish from about the beginning of the fourth to the end of the seventh century A.D. Chapter six offers a structurally motivated modification of Jackson's account of the evolution of the British Celtic vowel system in his seminal *Language and History in Early Britain* (*LHEB*). The very existence of that monumental chronologically oriented work obviates the need for a general relative chrono-logy of the British branch here. Aspects of Jackson's dating have come in for some revision from Patriek Sims-Williams (1990) and others of late, but this further advance would scarcely have been possible if *LHEB*'s treatment had not been there in the first place. Notwithstanding significant partial discussions such as those by David Greene (1973) and Frederik Kortlandt (1979 and 1982), nothing comparable has hitherto been on offer for Irish. Chapters four and five of this book are a modest attempt to fill that gap in the hope that they too will provide a basis for further progress in this notoriously tricky area.

Much of chapters two to five is a somewhat altered and considerably expanded English version of pages 66-92 of my contribution on Old Irish and its prehistory ('An tSean-Ghaeilge agus a Réamhstair', pp. 61-219) to the recently published *Stair na Gaeilge* (*SnaG*). The discussion of the Celtic reflexes of the PIE syllabic nasals in chapter three is derived from an article in *Studia Celtica Japonica* (McCone, 1991) and chapter six represents the reworking of an unpublished lecture given to the Philological Society in London a couple of years ago. Citations from works in German, French or Spanish have been silently translated into English.

My thanks are due to Seán Ua Súilleabháin for kindly supplying a full reference I did not have access to. Drafts of this book have been read with

typical acuity by my graduate students David Stifter and Karin Stüber and by my friends and colleagues in the field Liam Breatnach, Damian McManus and Peter Schrijver, each of whom made a number of helpful corrections and suggestions. It is a pleasure to record my gratitude to them for the improvements they introduced. Needless to say, this generous assistance should not be taken to imply their agreement with all of the views contained in this book and remaining blemishes are my responsibility alone.

Kim McCone
Department of Old Irish
St. Patrick's College
Maynooth
June, 1996

TABLE OF CONTENTS

CHAPTER ONE

The Phonology and Orthography of the Attested Celtic Languages

1. INTRODUCTION. Documentation of the Celtic languages extends more or less continuously from about the middle of the first millennium B.C. right down to the present. The first part of this long period is primarily represented by the meagre but growing corpus of Continental Celtic epigraphic material down to the third or fourth century A.D. and then by short fifth- and sixth-century Irish Ogam inscriptions. The emergence of the manuscript record in the seventh and eighth centuries A.D. marks the beginning of the by and large adequate attestation of Irish and British Celtic thereafter.

These chronologically and geographically diverse sources naturally mirror the different circumstances in which various Celtic peoples acquired writing. Lepontic/Cisalpine Gaulish inscriptions were written between about the sixth and the second century B.C. in the so-called 'Lugano' alphabet derived from that of the neighbouring Etruscans. Beyond the Alps in the Narbonese the proximity of the Greek colony of Massilia (Marseille) provided the impetus for the production of short Gaulish texts in the Greek alphabet during the first three centuries B.C. Thereafter a number of stone inscriptions in the monumental Latin alphabet and more numerous texts of a humbler nature in Roman cursive script dotted over a larger area of Gaul reflect the intensification of Roman influence in the imperial period. In Spain the Celtiberians have left us inscriptions written in their language on bronze etc. during the second and first centuries B.C. in the northeastern version of the Iberian alphabet adopted from the non-Indo-European neighbours on their eastern flank. There are also a few rock inscriptions in the Latin alphabet in the wake of increasing Romanisation from the second century B.C. onwards.

In Ireland and Britain Latin literacy associated with the Church provided the obvious model for the development of vernacular writing systems. Whatever the precise details of its genesis, the Ogam system of letters represented by one to five notches or strokes over or adjoining a central line was almost certainly based upon the Roman alphabet and 'there is nothing inherently improbable in the hypothesis that the Ogam and Latin alphabets could have coexisted side by side in complementary capacities, the one serving like Roman capitals as a monument script, the other essentially a book script used exclusively for Latin writing in the early period but gradually extending to Irish with the development of literacy in the vernacular' (McManus, 1991, 59). Due allowance being made

for discrepancies resulting from significant differences between their respective sound systems, the basic spelling conventions of Irish and British vernacular manuscript sources from the seventh or eighth to the twelfth centuries had much in common. Essentially these reflected Latin as pronounced in Britain - *lingua latina in bocca britannica*, so to speak. This, of course, is hardly surprising in view of the decisive role played by British missionaries such as Saint Patrick in the establishment of Christianity and Latin learning in fifth- and sixth-century Ireland. The period from the twelfth century onwards was one of experimentation, transition and increasing divergence as far as the orthographies of Irish and the ever more clearly differentiated Welsh, Cornish and Breton were concerned.

Since the present phonological study deals with languages or phases thereof only accessible in written form, it is important to be clear from the outset about the orthographical conventions underlying the diverse material under consideration. Where, as is often the case, a writing system passes from one language to another with a somewhat different system of sounds, a perfect fit can hardly be expected. Shortcomings in the representation of the sounds of the borrowing language may then either be tolerated or else at least partially overcome by modifications liable to be introduced on a gradual and piecemeal basis. Since such factors conspire to make the spelling rules of most attested Celtic languages peculiar to a greater or lesser extent, the remainder of this chapter will be devoted to the relationship between the phonological and orthographical systems of Gaulish, Celtiberian, Old and Middle Welsh, and Old and Middle Irish.

2.1. GAULISH. On the whole, Gaulish was probably the most phonetically conservative of the attested Celtic languages and appears to have had the following basic phonemic inventory.

voiceless stops:	p	t	k		
voiced stops:	b	d	g		
sibilant:	s				
affricate:	ʦ				
nasals:	m	n			
liquids:	r	l			
semivowels:	w	y			
short vowels:	i	e	a	o	u
long vowels:	ī	ē	ā	(ō)	ū
diphthongs:			ai	oi	ui
			au	ou	

A more detailed treatment of aspects of this system as well as of certain

developments within the recorded history of Gaulish will be found in chapter three, the possibility of very limited occurrence of /ō/ (whence the brackets above) being discussed in II.5.4. It is worth noting here that there was a tendency for vowels to have raised and/or fronted allophones such as [ɪ] for /e/ or [æ] for /a/ before a nasal in certain environments (II.5.1), notably when it was followed by an obstruent, and that the difference between the voiceless and voiced guttural stop phonemes /k/ and /g/ was neutralised as a voiceless velar fricative allophone [x] of both before /t/ or /s/.

2.2. Although they had probably been preceded by expansion westwards and northwards into Transalpine Gaul, it was the migrations into the Cisalpine province that first thrust the Gauls into the light of history. According to Polybius (II 17) and Diodorus (XIV 113) the invasions that drove the Etruscans out of the Po Valley took place around the beginning of the fourth century B.C. However, de Simone (1980) has adduced onomastic evidence from Etruscan inscriptions for a Gaulish presence south of the Alps in the early fifth or even the sixth century B.C. that would tie in with Livy's (V 33-5) claim that the earliest penetration of Gauls into the area occurred some two centuries earlier. In similar vein Prosdocimi (1986, 232-3) would date the Prestino inscription on palaeographic grounds to the first half of the fifth century at latest.

Lejeune (*Lej.*) distinguished the 'para-Gaulish' Lepontic of the earlier inscriptions in the immediate vicinity of the North Italian lakes from the Cisalpine Gaulish proper of the later Todi bilingual (*RIG* E-5, *Lam.* 74) found rather mysteriously in Umbria and a handful of other inscriptions, notably that of (San Bernardino de) Briona (E-1, *Lam.* 72) and the subsequently discovered Vercelli bilingual (E-2, *Lam.* 76), both hailing from just south of the Lepontic area. Hence the exclusion of Lepontic material from *RIG* and the main part of Lambert's (*Lam.*) recent book on the Gaulish language, whereas it will be argued in chapter two below that Lepontic is best viewed as a variety of Gaulish rather than a separate branch of the Celtic family. However, the matter is of no consequence here since the same 'Lugano' alphabet is used in all of this Cisalpine epigraphic material, due allowance being made for the shift from an original leftwards orientation inherited from Etruscan to a later rightwards one in conformity with by then current Roman practice. In what follows a standard transcription is used (see *Lam.* 79 for the letter shapes as they actually occur in the Lugano script).

The most striking effect of its Etruscan derivation upon the Lugano alphabet is the absence of a distinction between voiced and voiceless stops, with the result that P = /p/ or /b/, T = /t/ or /d/ and K = /k/ or /g/, and failure to write /n/ before another consonant. Both features are indisputably present in the rendering of the Roman name and title *Quintus legatus* as KUITOS LEKATOS on the Briona inscription and probably also occur in LOKAN = /longan/ at Todi (McCone, 1993, 245-8). Whereas the Etruscans' lack of use for the signs B, D

and (at least in its original voiced value /g/) C adopted from the Greek alphabet was doubtless due to the absence of a straightforward phonemic opposition between voiced and voiceless stops in their language, a comparison of TRUTIKNOS and ARKATO- in the Lugano alphabet with their equivalents DRUTEI F(ilius) and ARGANTO- in the Roman alphabet on the Todi and Vercelli bilinguals leaves no doubt about the purely graphic status of the non-observance of this distinction in Cisalpine Gaulish. On the other hand, although O, like B and D, was a 'dead' letter confined to early versions of the Etruscan alphabet and not in practical use, it was taken over into the Lugano alphabet with the value /o/ alongside A, E repesenting /a/, /e/ or /ā/, /ē/ and I, U representing /i/, /u/, /ī/, /ū/ or /y/, /w/. Of the remaining six signs in regular use in the Lugano alphabet L, M, N and R have the same values as in its Roman counterpart but it is not clear precisely what difference, if any, there was between the two separate signs for the sibilant(s) inherited from an early Greek alphabet via Etruscan and normally transcribed Ś and S (but here both as S). Of the remaining Etruscan derivatives used sporadically in the Lugano alphabet Z (= /ʦ/?), V (= /w/) and Θ (probably = /t/) are found on the orthographically eccentric and probably early (see above) Prestino inscription, while X at Vercelli and Gropello (E-3) apparently has the value /g/.

2.3. The East Greek alphabet adopted in the later third century B.C. by the Narbonese Gauls, presumably from the nearby colony of Massilia, would seem to have had typical *koinē* values of the time. Thus π, τ, κ represented voiceless /p/, /t/, /k/ and β, δ, γ voiced /b/, /d/, /g/ in the usual way and similarly ρ, λ, μ, ν, σ = /r/, /l/, /m/, /n/, /s/. Although the change of the sounds represented by ϕ, θ, χ from voiceless aspirate stop /p^h/, /t^h/, /k^h/ to voiceless fricative /f/, /θ/, /x/ had not yet taken place in Greek (Lejeune, 1972, 59-61), the latter two letters were pressed into service to denote a dental and a velar sound respectively occurring in Gaulish but not (yet) in Greek. Hence θ = /ʦ/, optionally at least (see II.2.2), and χ = [x] before /t/.

The Gaulish short vowels /a/, /e/, /i/, /o/ and *i*-diphthongs could be represented quite straightforwardly by Greek α, ϵ, ι, o and $\alpha\iota$, $o\iota$. However, the *koinē* value of υ was /ü/ rather than /u/ as a result of an early fronting in the Attic-Ionic dialects upon which it was based (Lejeune, 1972, 237) and the sound denoted by the digraph *ου* had progressed from an original diphthong /ou/ to mid-high back /ō/ by the fourth century B.C. in Attic Greek and then to high back /ū/ in the third-century B.C. *koinē* (Lejeune, 1972, 230). Accordingly this was the spelling chosen to represent both short and long high back /u/, /ū/ as well as consonantal /w/ and /u/ as the second element of a diphthong in Gaulish (cf. Hellenistic Greek transcriptions of Roman names such as Λούκουλλος = *Lūcŭllus*, Οὐαλέριος = *Valerius*): e.g., *μεδου-* /medu/ (G-71), *βρατου* /bratū/ (G-64 etc., *Lam.* 86-8), *ουενιτοουτα* /wenitoutā/ (G-106), *ταουνικν*[ος] /tauniknos/. Not surprisingly α could stand for short /a/ or long /ā/ in Gaulish

as in Greek, e.g. *λιτουμαρεος* /litumāreos/, and unambiguously diphthongal *αυ* was an alternative to *αου* as in *βαλαυδουι* /balaudui/ (G-121).

Although the spellings *κορνηλια* (G-65) and *πραιτωρ* (G-108) suggest η, ω = ē, ō in Roman names or words on these Gaulish inscriptions, their general status there as infrequent variants of ϵ and *o* is clear from spellings such as *νεμητον* /nemeton/ (G-153), *ουεβρο*[υ-..] (G-61) or *ουηβρου-* (G-27) /webru/, and *τουυτι-* (G-153) or *τωυτι-* (G-257) /touti/ (*ωυ* locally = /ou/ as opposed to *ου* = /u/ or /ū/). This interchangeability might be connected with the incipient loss of phonemic distinctions of length in Greek from the later 3rd. century B.C. onwards (Browning, 1969, 33) but the virtual lack of a long /ō/ phoneme in the Gaulish of this period would anyway have left *ω* free for other uses, *ου* was the only spelling corresponding to back /u/, long or short, and the basic mid-low value /ē/ of Greek η may have militated against a regular connection with mid-high Gaulish /ē/, which happens not to be attested so far on inscriptions in the Greek alphabet.

The sound underlying *ει* had developed in tandem with that of *ου* above from an original diphthong /ei/ through mid-high /ē/ in fourth-century Attic to high front /ī/ in the third-century *koinē* (Lejeune, 1972, 229-30) and it is worth noting that there is evidence for an /ī/ pronunciation about a century earlier than this in the East Ionic area (Stüber, 1996, 31) from which the Phocaean colonists of Massilia hailed. Consequently *ι* and *ει* tend to denote Gaulish /i/ or /y/ and /ī/ respectively as in *ιουγιλλιακος* /yugilliākos/ (G-28), *ουριττακος* /writtākos/ (G-68) and *μεδουρειξ* /medurīxs/ (G-71). Nevertheless, here as elsewhere there is some graphic confusion of the long with the short vowel, e.g. *-ουι* (G-120 etc.) or, probably, *-ουει* (G-151) for dat. sg. /ui/ and dat. sg. *μαγουρειγι* /magurīgi/ (G-121) or, probably, *ουριθθουριγου*[ι] /writʦurīgu[i]/ (G-217). Being roughly equidistant between /e/ and /i/, the allophone [ɪ] of /e/ before nasal plus obstruent could be spelled ϵ or *ι* as in *εσκιγγαι* or *εσκεγγαι* [eskɪŋgai] (G-135 and G-146; note *γγ* = [ŋg] here and elsewhere in accordance with standard Greek usage).

2.4. By and large the letters of the Roman alphabet, both monumental and cursive, used to write Transalpine Gaulish during the first three or four centuries A.D. seem to have had their conventional Latin values, although spelling fluctuations between *c* and *g* especially may have been due to a discrepancy between Latin fortis and Gaulish lenis single voiceless stops (Watkins, 1955; cf. Ellis Evans, 1967, 400-3). However, the Greek signs θ and χ used to represent a dental and a fricative sound peculiar to Gaulish (2.3) were adapted into this new writing system, the former as monumental Ð or cursive ð(ð), *(d)s(s)* and the latter as X (alongside C) or *x* (alongside x = /xs/, *c* or *g*). Thus EPAÐATEXTORIGI /epaʦatextorīgi/ (L-6), *neððamon* /neʦamon/ (Vendryes, 1955), *lidssatim* (*Lar.* 1a5) or *lis(s)atim* (2a6, 2a9 etc.) /liʦatim/, *liðatias* /liʦatiās/ (2b2-3), *suexos* /swexsos/ (La Graufesenque, *Lam.* 131), *ni-*

tixsintor /nītixsintor/ (*Lar.* 1a7), *adsagsona* (1a4), *adsax[ ]na* (2b8) /adsaxsona/, *brictom* /brixtom/ (1a3), *duxtir* /duxtīr/ (1a11), VECTIT[ ] /vextit/ (L-1), CONTEXTOS /kontextos/ (L-10). It is unclear to what extent considerable variations in the spelling of probable /ʦ/ were purely orthographical or represented different chronological or local developments of this sound such as assimilation to /ss/, /tt/ or metathesis to /st/. The whole question has been subjected to a thorough and balanced evaluation by Ellis Evans (1967, 410-20).

The diphthong appearing regularly as OU and *oov* or *ωv* /ou/ on the older Cisalpine (Briona TOUTAS) and Narbonese (2.3 above) inscriptions respectively is written EV or OV in the Roman alphabet, e.g. 3sg. IEVRV (L-3, *Lam.* 92-104) or 3pl. IOVRVS (L-12, *Lam.* 97-8), ANEVNO (also *ανεουνος* in Greek letters beneath; L-4, *Lam.* 94), TOVTISSICNOS (L-11, *Lam.* 97) but *Teutates* in Lucan. The chronology of the attestations makes it most unlikely that these *eu* spellings preserve an older pronunciation unaffected by /eu/ > /ou/. If they have any phonetic basis, one might envisage a rough and sporadic Gaulish parallel to alleged OW /oü/ > MW /eü/ but a purely orthographical explanation seems far more likely since Classical Latin did not possess a diphthong /ou/ but did have a diphthong /eu/ in words such as *seu*, *neu*, *neutrum*. That being so, there were two obvious approaches to representing Gaulish /ou/ in the Roman alphabet: either Greek *oov* could be transcribed OV or Latin's one *u*-diphthong *eu* could be pressed into service as a rough equivalent of /ou/. Both strategies are attested.

3.1 CELTIBERIAN. Lusitanian is known from a couple of rather late inscriptions in the standard Roman alphabet. Obscure though these are, it is clearly Indo-European. However, there has been some disagreement as to whether it is Celtic or not. Thus Untermann (*MLH* I/1, 77-8) contrasts Tovar's opinion that Lusitanian is an Indo-European language quite separate from Celtiberian with his own contention that these are merely two clearly distinguished dialects and can both be regarded as languages that probably stand close to Ancient Celtic.

Given that Armenian is the only other IE language with a comparable loss of PIE *p*, this circumstantial and systematically unmotivated change seems unlikely to have happened independently at two or more sub-Celtic nodes. Consequently it and the changes that preceded it (II.1.5) should, in the absence of compelling counter-evidence, be projected back to a single shared phase that can only reasonably be designated Proto-Celtic. From this it follows that a language like Lusitanian, which on the inscription of Cabeço das Fráguas preserves PIE *p* unchanged in PORCOM 'pig' alongside TAVROM 'bull' lacking the presumably Proto-Celtic metathesis to **tarwos* seen in OIr. *tarb*, MW *tarw*, Gaul. TARVOS, cannot properly be considered a Celtic language. There is, of course, a logical possibility of separation from the rest prior to a late change like *p* > Ø but after sharing some earlier peculiarly Celtic developments. In that case it might be considered a para-Celtic rather than a non-Celtic IE language but, in the present state of knowledge at least, sound methodology demands that only languages characterised by the more significant changes down to and including *p* > Ø discussed in the following chapter be considered Celtic. So far Lusitanian simply does not qualify for the label Celtic or even para-Celtic and will be left out of account in what follows.

3.2 That being so and despite good onomastic evidence for Celtic settlement in an extensive western and central area, the only securely Celtic language so far known from the Iberian peninsula is the northwestern central Celtiberian, to which the following phonemic inventory may be provisionally ascribed in anticipation of the discussion below and in chapter three. Bracketing of *ē* below is in accordance with the argument in 3.6 that this became *ī* in the course of the period from which texts are attested, if not before. As yet there seems to be no firm evidence on the presence or otherwise of a /ʦ/ phoneme similar to that in Gaulish but **r-o-bi-s-e-ti** in 3.5 below might be taken as an indication of assimilation of *ts* to *(s)s* unless it is a purely graphic device for avoiding a cumbersome ***ro-bi-te-s-e-ti** or the like to represent /robitseti/ (cf. 3.4 on /xs/).

voiceless stops:		t	k	k^w		
voiced stops:	b	d	g	g^w		
sibilants:	s	z				
nasals:	m	n				
liquids:	r	l				
semivowels:	w	y				
short vowels:		i	e	a	o	u
long vowels		ī	[ē]	ā		ū
diphthongs:				ai	oi	ui
				au	ou	

There can be no doubt that the Celtiberians first acquired writing from their neighbours to the immediate east, namely the non-Indo-European Iberians who inhabited the whole eastern coast of Spain and had devised a peculiar system of orthography, part syllabic and part alphabetic, on the basis of Greek and/or Phoenician models. Only after the second-century B.C. Roman conquest of the Iberian peninsula was limited use made of the monumental Latin alphabet to write Celtiberian and Iberian.

The Iberian alphabet had five vowel signs with no distinction of length transcribed **a**, **e**, **i**, **o** and **u**. These were capable of various combinations with each other and of directly preceding or following the 'pure' consonantal signs for continuants transcribed **m**, **n**, **l**, **r**, **ŕ**, **s** and **ś**. This alphabetic system did not, however, apply to the stops, for which the Iberian script distinguished one

labial, one dental and one guttural only but had no signs for a stop alone and instead employed five separate signs for each in combination with a different following vowel. Hence the signs usually transcribed **ba, be, bi, bo, bu, ka, ke, ki, ko, ku** and **ta, te, ti, to, tu.**

3.3 Controversy about the origins of this script, which was used to write Iberian from about the fourth to the first century B.C., is due to two main factors. Firstly, either a Greek or a Phoenician model is *a priori* plausible in view of early Phoenician colonisation and subsequent Carthaginian dominance centring round Gades (Cadiz) in the southern Iberian peninsula on the one hand and of somewhat later sixth-century Phocaean Greek colonisation of the north-eastern coast in tandem with the establishment of Massilia (Marseille) on the other. Secondly, the peculiar way of representing consonant plus vowel might be put down to a Phoenician model without separate vowel signs whereas the use, albeit somewhat restricted, of five distinct vowel signs would point rather to a Greek original. Both of the main regional variants of the Iberian alphabet, termed Northeastern and Southern respectively, have the same basic system but differ in the forms of a number of letters and in their orientation. Southern inscriptions follow the Phoenician mode both in the shapes of some letters and in a leftwards (but occasionally rightwards) direction of writing, whereas those of the northeast bear more affinity to the Greek both in shape and rightwards orientation of the letters (apart from a solitary example of boustrophedon). That being so, a Greek-based original secondarily influenced by Phoenician in the South or a Phoenician-based original later subjected to Greek influence in the Northeast would appear to be more or less equally economical postulates. Moreover, a number of letters in the Phoenician alphabet and early Greek derivatives thereof are quite similar, as one might expect, and quite a few Iberian signs, particularly some of those for stop plus vowel, display no obvious relationship with either a Greek or a Phoenician letter.

Paul Russell puts matters as follows. 'It is generally agreed that the script used for both Iberian and Celtiberian derived from a script used in the southern part of the peninsula for writing an early form of Iberian and another unknown language between the 7th and 1st centuries BC (de Hoz...). In origin the script was a modified version of the Phoenician script of the Phoenician and Carthaginian settlers of Tartessus and the southern coast of the peninsula (Cunliffe...). Given the identity of most of the signs, this explanation is essentially correct, but the modifications have been considerable... First, being originally a script for a Semitic language like Phoenician, it has no vowel signs, and these have been developed. Secondly, Phoenician is an alphabetic script, but it has been turned into a syllabary in a rather haphazard way. For example, there does not seem to be any correlation of voice..... A shift from alphabet to syllabary is itself curious; the usual line of development tends to be from a syllabary to an alphabet. It has been suggested that Greek influence may explain

the vowel signs and the shape of certain letters..., but if the dating of the earliest Iberian material to the 7th century BC is correct, it is rather early to expect Greek influence of that type' (1995, 204).

Jürgen Untermann is more circumspect. 'The *communis opinio* of present-day research in Spain and Portugal seeks the origin of the Iberian script in southern Andalucia, thus seeing its oldest form in the Tartessan or Southern Iberian alphabet and then reckoning with a spread northeastwards. I am not convinced that all objections to this hypothesis have been disposed of. The Tartessan script gives the distinct impression of being recent both as regards system and form. The dating of the documents too permits no decision as yet: the practice of writing begins in Ullastret in the extreme northwest scarcely later than in the south. One of the oldest inscriptions in the Southern Iberian alphabet... was found on the northeastern edge of its domain and the chronology of the Tartessan inscriptions does not seem to me to be established beyond all doubt. Finally, it must still be considered difficult to deny all Greek influence on the creation of the Iberian alphabet, including the Southern: for instance, the monophonemic (and unambiguous) signs for continuant consonants and vowels...' (*MLH* III/1, 135-6).

In this context it is worth noting that in an area just north of Alicante, close to the boundary between the two main regions where the Northeastern and the Southern alphabets respectively held sway, a slight adaptation of a late archaic Ionic Greek alphabet (presumably that of Phocaea) was used to write Iberian and that one such inscription at least can be dated as early as the first half of the fourth century B.C. (*MLH* III/1, 133). Moreover, this is the very area from which the early (fourth-century) inscription in the Southern alphabet referred to above by Untermann hails.

These inscriptions in the Greek alphabet provide vital evidence concerning the phonological reality that lies behind various ambiguities in the Iberian script. To begin with, use of a diacritic to distinguish a second *r* and of two signs for sibilants (*MLH* III/1, 153-4) shows that the deployment of two signs by the Iberian alphabet in both cases was based upon a genuine opposition between two *r*- and two *s*-phonemes (cf. Basque). As far as the stops are concerned, they indicate the existence of one labial (*b*) plus two dentals (*t* and *d*) and gutturals (*k* and *g*), the possibility of a word-final dental or guttural but, crucially, the inadmissibility of groups of stop plus further consonant such as **br*, **kt*, **dn* etc. (*MLH* III/1, 155). The development of special signs for stop plus vowel can thus be regarded as a well motivated response to the non-occurrence of preconsonantal stops in Iberian. No more than five composite signs were required in the case of the sole labial stop and this system may well have been extended to the dentals and gutturals in order to obviate the further ten signs needed to represent a probable voiced/voiceless opposition. Viewed in this light, these syllabic signs had all the labour-saving convenience of

ligatures and could well have been developed on practical grounds from a Greek original with separate vowel signs. That said, 'the question of how final stops are written in the Iberian alphabet is not yet resolved: on the evidence of the texts in Greek script both gutturals and dentals occur in this position. The fact that **ke** and **te** are about twice as common as **ka**, **ta**, **ki** and **ti** suggests that the syllabic signs with **e** also served to represent final *g*, *k*, *d* and *t*... Since, however, words ending with *-ge*, *-ke* and *-de* are found on inscriptions in the Greek alphabet as well..., it is not possible to determine the correct reading of a syllabic sign containing **e** at the end of a word in any given instance' (*MLH* III/1, 135).

3.4 Whatever the advantages of the above features for the representation of the non-Indo-European Iberian tongue, they were unquestionably ill suited to the phonotactics of a Celtic and Indo-European language like Celtiberian, which readily tolerated clusters of stop plus another consonant (but may not have had word-final stops), had a phonemic voiced/voiceless opposition in the dental and guttural stops (but no /p/; cf. Iberian) and would have inherited only a single /r/ and /s/ phoneme. Obviously adaptation of the Northeastern Iberian alphabet of their neighbours to Celtiberian was bound to pose some tricky problems and it will emerge below that these were no more than partially solved.

The ambiguity of **ti**, **ka** etc. with regard to voiceless/voiced (*t/d*, *k/g*) was tolerated in Celtiberian as in Iberian and it seems clear that sequences of the type CRV (where C = stop, R = continuant, V = vowel) were normally represented by means of the stop sign comprising the same vowel as that following the continunant (i.e. CV_xRV_x, the value (x) of the second vowel being replicated by the 'dead' first vowel): e.g., **ti-r-i-s** /trīs/ 'three' (*Bot.* A6), **a-bu-l-u** /ablū/ (*Bot.* B8) = *Ablo* on a Latin inscription, **s-e-ko-bi-r-i-ke-a** /segobrigeā/ (*Celtib.* 57), **ba-r-a-z-i-o-ka** /braziokā/ (*ibid.*, cf. Lat. *Brasaca*), **ko-l-o-u-n-i-o-ku** /klounioku(m)/ (*ibid.*, = *clounioq(um)* in Latin alphabet), **l-e-to-n-tu** /letondū/ (*Bot.* B1 etc.; cf. gen. *Letondonis* on a Latin inscription). Sometimes, however, use of a dead vowel was avoided by metathesis or omission of a liquid as in forms or derivatives of Latin *Contrebia* such as **ko-n-te-r-bi-a**, **ko-n-te-bi-a-z**, **ko-n-te-ba-ko-m** (*Celtib., 58-9*). In the case of a final consonant cluster the preceding vowel was the only one available to determine selection of the dead vowel, a probable example being the name **te-i-u-o-r-e-i-ki-s** /dīworīxs/ (Luzaga 8; *Celtib.* 98 and 100). All examples of conceivable relevance to the question of 'dead' vowels in Celtiberian orthography have now been collected and discussed at length by de Bernardo Stempel (1996).

Omission seems to have been the more usual method of dealing with the fricative allophone /x/ of a guttural stop before *s* or *t*. Untermann (*MLH* II, 47) notes a number of likely examples in Iberian renderings of arguably Gaulish personal names such as **a-u-e-ti-r-i-ś** (= *Advectirix* /adwextirīxs/?) and **a-n-e-ti-l-i-k-e** (= *Anextlikos*?) on inscriptions from the vicinity of Narbonne

in southern France and *Bot.* A5 **a-m-bi-ti-s-e-ti** presumably represents /ambitixseti/ or the like by virtue of its obvious association with 'infinitive' **a-m-bi-ti-n-ko-u-n-ei** on the following line. The 'Ibero-Gaulish' examples, the one on the Luzaga bronze and the representation of the placename **u-s-a-m-a** as *Uxama* and Οὔξαμα in Latin and Greek letters (Villar, 1995, 181) indicate a purely graphic simplification, *pace* Lejeune's (*Celtib.* 56, n. 134) suggestion that **r-e-tu-ke-n-o** might contain *rētu-* < *reitu-* < *rectu-* rather than the straightforward /rextu-/ seen in the Gaulish cognate *Rextugenos* (Ellis Evans, 1967, 109). However, Villar (1995, 188) has argued for a late tendency to simplify /xs/ to /s/ in final position at least on the strength of SEGOBRIS (< /-brixs/) and the like in the Roman alphabet. Finally, although a nasal was normally written before a stop as in **ko-n-te(-r)-bi-a(-)** above, there are occasional instances of its omission as in the coin legend **s-e-ko-ti-a-z l-a-ka-z** (*MLH* I/1, 299) corresponding to the placename Σεγόντια Λάγκα in Ptolemy (2, 6, 55).

Obviously none of the above approaches to the problem of writing consonant clusters in the Iberian alphabet was devoid of ambiguity but a more satisfactory alternative of writing a 'plene' vowel after a stop + vowel sign as an indication that the vowel really was to be pronounced (as in Tartessan; *MLH* III/1, 135, n. 17) was a sporadic late development only found so far on a handful of short inscriptions such as the tessera B4 **ku-i-r-o-r-e-ki-i-o-s ḿ-o-ń-i-tu-u-ko-o-s ń-e-ḿ-a-i-o-s a-l-e-tu-u-r-e-s** (*Celtib.* 102). Untermann's tentative inference above that **-ke**, **-te** were used to represent final *-k/g*, *-t/d* in Iberian might lead us to expect the same usage in Celtiberian inscriptions written in the Iberian alphabet, the conventions of which the Celtiberians would seem to have followed rather slavishly. However, there is as yet no reliable evidence on this point, quite possibly for the good reason that Celtiberian did not have stops in postvocalic auslaut (see 3.5 below).

Retention of the voiceless labiovelar k^w in Celtiberian is indisputable on account of **-ku-e** 'and' (< PIE *$*-k^we$* 'and' underlying Lat. *-que*, Skt. *-ca*, OIr. *-ch* etc.). This combines with the argument in II.1.2 to make parallel survival of its voiced counterpart g^w (PC g^w < PIE g^{wh}) likely but proof is hard to come by on account of the ambiguity of the Iberian alphabet regarding the dichotomy voiceless/voiced. The sept name (gen. pl.) **ku-e-z-o-n-ti-ku-m** (Villar, 1995, 140) might be read /g^{w}ezontikum/ and taken to contain the PC root *$*g^wed$* 'pray, beseech' < PIE *$*g^{wh}ed^h$*, while *Bot.* A8 **ku-a-ti** might conceivably represent /g^{w}anti/ 'strikes' (with zero grade generalised from the pl. PC *$*g^wan$*- < PIE *$*g^{wh}n$*-C-; McCone, 1986, 228). Schrijver (forthcoming) offers an attractive interpretation of Celtiberian **ko-r-ti-ka** as /gortikā/ 'object of counter-value' cognate with MW *gwarthec* 'cattle' < PC *$*g^wortikā$* (< *$*g^{wh}$*-). In the words of his final paragraph, 'this etymology presupposes a new phonological development for Celtiberian, viz. the loss of the labial element of the labiovelar

g^w before the rounded vowel **o*' (cf. 5.1).

3.5 Regarding the continuants, there is nothing much to remark about **l**, **n** and **m** except a local western usage whereby the sign designating /n/ elsewhere was employed for /m/ (and then transcribed **ḿ** where necessary as in B4 above) and a sign conventionally transcribed **m̃** in later Iberian inscriptions (*MLH* III/1, 137-8) was used for /n/ (transcribed **ń** as in B4). The Iberian dichotomy of two *r*-phonemes and two matching *r*-signs, transcribed **r** and **ŕ**, was superfluous in Celtiberian with its solitary *r*-phoneme. Consequently only one sign (corresponding to Iberian **ŕ**) was adopted. Since this lacks competition in the relevant documents, it is usually transcribed as **r** without diacritic in the case of Celtiberian.

On the other hand, both of the Iberian sibilant signs **s** and **ś** were adopted by the Celtiberians and the contrast with their readiness to jettison an unnecessary extra *r*-sign suggests that there was a good phonological reason for this. Since both *s*-signs are well attested, often on one and the same inscription, there has been considerable discussion (e.g. *Celtib.* 46-9) concerning their distribution and likely phonetic value in Celtiberian, which can safely be taken to have inherited a single sibilant phoneme from Proto-Celtic and Proto-Indo-European (II.2.1). Building upon his own pioneering work (1993) and a couple of suggestions by others (Eichner, 1989, 44; Meid, 1993, 117-8), Villar (1995, 17-82, and 1995b) has recently produced a compellingly argued account with considerable, not to say exciting, further ramifications. His basic conclusion is that the Iberian letter **ś** represented the voiceless sibilant /s/ more or less directly inherited from PIE and so should be transcribed **s** in Celtiberian (a practice followed here), whereas Iberian **s** had a voiced pronunciation as /z/ and/or /ð/ and so might best be rendered as Celtiberian **z** (as here). The crucial point was that this **z** not only arose through the voicing of *s* intervocalically and after a sonorant but was also the regular outcome of *d* in the same environments as well as in postvocalic final position. The following examples from *Bot.* will serve by way of illustration: **i-a-s** (*yās*), **bi-n-ti-s** (*-is*), **ka-bi-z-e-ti** (< **gab-i-se-ti*), **a-m-bi-ti-s-e-ti** (*-tix-se-ti*), **a-r-z-n-a-s** (< **arsnās*), **u-e-r-z-o-n-i-ti** (< **wer-sonī-ti*), **e-s-a-n-ki-o-s** (*exs-ankios*), **i-s-te** (*iste*), **ti-z-a-u-n-e-i** (< **dī-da-unei*; simplex **ta-u-n-e-i** in preceding sentence), **ta-tu-z** (< **da-tūd*, 3sg. fut. ipv. < PIE **-tōd*), **bi-z-e-tu-z** (< **bid-e-tūd*), **r-o-bi-s-e-ti** (< **ro-bit-se-ti*), **s-o-z** (< **sod*).

Given that a dental was the only stop normally permitted in absolute auslaut in PIE and that the comparative evidence points to neutralisation of the voiced/voiceless opposition in such cases, probably in favour of voiced *-d* after a vowel at least (see Szemerényi, 1973), the change *-d* > *-ð/z* may well have deprived Celtiberian of postvocalic final stops. Villar (1995b, 17-9) has suggested that a handful of Celtiberian forms in **-e-z** may actually be 3sg. verb

forms continuing a secondary ending **-t* [-d]. It would follow from this that, *pace* Meid (1994, 36, where it is taken as an imperfect), SISTAT in the Latin alphabet at Peñalba de Villastar continues primary **-ti* rather than secondary **-t*, as is anyway *a priori* probable in the case of what is obviously a present stem (cf. OIr. *-sissedar*, Gk. ἵστατοι 'stands' etc. < pres. **sisth$_2$-*). Hence Villar's (1995b, 30) suggestion that Celtiberian might have developed a third person primary/secondary opposition *-t/-z* (< **-ti/*-d*) comparable to Italic *-t/-d*, in which case 3sg. verbal forms in **-ti** such as those in the previous paragraph from texts in the Iberian alphabet should be read /-t/. If so, it is difficult to avoid the conclusion that this Celtiberian apocope of **-ti* to **-t* (or even of *-i* in general) occurred after adoption of the Iberian alphabet with the result that the **-ti** originally employed to represent /-ti/ continued in use after this had become /-t/. Otherwise one would have to envisage the remarkable coincidence that **-ti** was more or less randomly preferred to one of the other four equally viable signs **-ta**, **-te**, **-to**, **-tu** as a rendering of /-t/, which seems (*pace* de Bernardo Stempel, 1996, 240-4) particularly implausible in view of the likelihood that the Iberians themselves would have used **-te** in such a case (3.3-4 above).

3.6 The letters **a**, **e**, **i**, **o**, **u** correspond straightforwardly enough to the five short vowel phonemes that Celtiberian can be presumed to have inherited directly from Proto-Celtic. In the absence of an orthographical indication of length, it cannot be proved that Celtiberian had long vowels but there seems to be no reason to doubt that /ā/, /ī/ and /ū/ had come down more or less unchanged from Proto-Celtic along with the diphthongs /ai/, /oi/, /ui/ (most likely [ūi] in Celtiberian and Gaulish), /au/ and /ou/ seen in examples (*Bot.*) like **s-a-i-l-o**, **to-ko-i-to-s**, **s-o-m-u-i** (dat. sg.), **a-u-z-e-ti**, **bo-u-s-to-m**. Villar (1995, 82-107; 1995b, 24-8) has now shown quite conclusively that Celtiberian participated fully in the Proto-Celtic change *ō* > *ū* in final syllables and consequently had no /ō/ phoneme (see II.5.4). The only major difficulty relates to the issue of what sound or sounds were represented by the digraph **ei**.

It is hardly surprising that the existence of *ei* spellings in both the Iberian and the Latin alphabet such as **u-e-i-z-o-s** 'witness' *vel sim.* (OIr. *fíad* 'in the sight/presence of', MW *gwyd* 'sight, presence' < **wēdos* < **weidos*; Villar, 1995, 41-2) or *u*-stem dat. sg. LUGUEI 'to Lug' should have been taken either as direct evidence for survival of the /ei/ diphthong from Proto-Celtic in Celtiberian texts (e.g. Schmidt, 1977, 15) or at least as indirect testimony that the Celtiberians still had a preconsonantal diphthong *ei* when they adopted the Iberian alphabet (Schmoll, 1959, 106). Neither inference is by any means inevitable.

As far as the latter is concerned, it is uncertain that *ei* represented a diphthong rather than a monophthong in the still quite obscure Iberian language

for which this script was devised. Moreover, in the likely event that the vowel signs of the Iberian alphabet at least were due to Phocaean Greek models in the wake of sixth-century colonisation (3.3), it is worth bearing in mind that Phocaea lay in an East Ionic dialect area where monophthongisation of *ei* to mid-high *ē* seems to have occurred rather earlier than in Attic Greek, probably as early as the 6th. century in some localities (Schmitt, 1977, 101) including Phocaea itself on the evidence of εκοσι 'twenty' for εἴκοσι on a late sixth-century inscription from its colony Ampurias (*SEG* 37, 1990, 838.4), a form kindly brought to my attention by Karin Stüber. Consequently the digraph ει very likely had the value /ē/ in the Greek alphabet at least partially adopted by the Iberians. Secondly, endings like the consonant-stem dat. sg. or *o*-stem loc. sg. *-ei* might once have had sandhi variants [-ey] and [-ē] before vowels and consonants respectively, the former suggesting a spelling *-ei* then transferred to the latter as a convenient way of distinguishing long from short *e* (cf. III.1.3).

As to the actual value of *ei* in Celtiberian texts, Lejeune (*Celtib.* 137-8) was surely right to see evidence for monophthongal pronunciation in spelling fluctuations like **a-r-e-i-ko-r-a-ti-ko-s** vs. **a-r-e-ko-r-a-ti-ka** (Villar, 1995, 127) or **te-i-ti-a-ko-s** vs. **ti-ti-a-ko-s** (Villar, 1995, 84) and in the Luzaga bronze's **te-i-u-o-r-e-i-ki-s** with a second element that was never a diphthong (Gaul. *-rix*, OIr. *rí*, Lat. *rex* 'king' < PIE **rēĝ-s*), to which may be added the dat. sg. (of a cons. and an *i*-stem respectively) STENIONTE and GENTE on an inscription in the Roman alphabet (Villar, 1995, 91; contrast LUGUEI above). Cumulatively this creates a clear presumption that *ei* before a consonant and in auslaut was normally pronounced as a monophthong, probably /ē/ in the first instance, and that Celtiberian shared in the otherwise general Celtic change *ei* > *ē*. It is then possible to read **te-i-u-o-r-e-i-ki-s** as /dēworēxs/ ('a compound with second element /rēks/' according to Villar, 1995, 161), the corollary being that Celtiberian did not share in the otherwise general Celtic change *ē* > *ī*. If, however, Celtiberian regularly reflects Proto-Celtic *ō* > *ū* in final syllables, as conclusively shown by Villar (see the beginning of this section), it is difficult to see how it failed to be affected by the almost certainly earlier change *ē* > *ī* (II.5.4). That being so, **-r-e-i-ki-s** must surely be taken as /rīxs/ and it becomes very probable, particularly in view of the *ei/i* spelling fluctuation just noted, that the whole word is to be read /dīworīxs/ < PC **dēwo-rīxs* < **deiwo-rēks*. Probably, then, Celtiberian inherited no diphthong /ei/ but only the monophthong /ē/ into which this had apparently been transformed in Proto-Celtic. This doubtless mid-high /ē/ would seem to have undergone further raising to /ī/ not long before or even during the period of our Celtiberian texts with the result that any /ī/, whether from PC *ī* (< *ī* or *ē*) or *ē* (< *ei*), could be spelt *ei*, *i* or even *e*. In this respect it is worth noting that in Iberian too 'orthographic fluctuations between *e*, *ei* and *i*... are relatively frequent' (*MLH* III/1, 153). The

phonetic development posited here is, of course, virtually identical to those found independently in Greek and Latin, which gave rise to comparable spelling fluctuations in inscriptions.

4.1. OLD AND MIDDLE WELSH. Old Welsh as rather sparsely documented from the seventh or eighth to the twelfth century A.D. seems to have had the following basic phonemic inventory, from which the systems of Old Cornish and Breton diverge but slightly. Phonemes in square brackets below had ceased to exist in Middle Welsh as a result of loss or merger, while the set in round brackets is of very restricted occurrence and unique to Welsh, where it arose in the course of the Old Welsh period (*LHEB* 505-6). See Jackson (1967) for a full treatment of Middle Breton and Lewis (1990, 5-10) for a sketch of Middle Cornish, both of which will be left out of account here (r^h has been used instead of *ṛ* to represent voiceless *r* below, since the latter sign is used in accordance with the standard practice of Indo-Europeanists to represent syllabic *r* later in this book).

voiceless stops:	p	t	k				
voiced stops:	b	d	g				
voiceless fricatives:	f	θ	x				
voiced fricatives:	v	ð	[ɣ]				
sibilant:	s						
aspirate:	h						
nasals:	m	[ṽ]	n	ŋ			
(aspirated nasals:	m^h		n^h	$ŋ^h$)			
voiceless liquids:	r^h	ɬ					
voiced liquids:	r	l					
semivowels:	w	y					
vowels:	i	ɪ/i̇	e	a	o	u	ü
diphthongs:			ei	ai	oi	ui	
	iu	ɪ/i̇u	eu	au			oü

4.2 The lenition processes responsible for the two series of fricative phonemes above are described in chapter three. As a result of the basic lenition (III.4.1) the stops /b/, /d/, /g/ and /m/ developed fricative allophones [v], [ð], [ɣ] and [ṽ] between a vowel and a resonant (V, *r, l, n, m, y, w*), and probably in postvocalic auslaut too (except for *-m*, which became *-n*). The first British lenition (III.4.3) then produced the voiced allophones [b], [d], [g] of the voiceless stops /p/, /t/, /k/ in the same environments. It is eminently reasonable to suppose that this allophonic variation also affected British Latin, whether as a vernacular in use during and probably for some time after the Roman occupation or subsequently as a learned clerical language pronounced in the native

manner, with the result that Latin words such as *locus* 'place', *capistrum* 'halter', *scribendum* 'writing', *baculus* 'staff', *calamus* 'reed, stalk', *gradus* 'step, grade' would be pronounced /ɬoguh/, /kabistrun/, /skrīvendun/, /bag(u)luh/, /kalaṽuh/, /graðuh/ or the like. Since there could be no question of altering standard Latin orthography to indicate these regional traits, even when they had been phonemicised by the loss of final consonants and/or syllables, an orthographic convention will have arisen whereby the letters *b*, *d*, *g*, *m*, *p*, *t* and *c* represented the sounds most readily associated with them in some environments but *v*, *ð*, *ɣ*, *ṽ*, *b*, *d* and *g* respectively in others. This practice continued in use when the British vernaculars came to be written from the seventh or eighth century onwards, as can be seen from the form of the above as Latin loanwords in Old Welsh (Modern Welsh equivalents in brackets to demonstrate the actual pronunciation), namely *loc* (*llog*), *cepister* (*cebystr*), *scribenn* (*(y)sgrifen*), *bacl* (*bagl*), *calam* (*calaf*), *grad* (*gradd*).

The Old Welsh, Breton and Cornish spelling system, then, did not recognise the effects of lenition upon stops, whether as an initial mutation or as a word-internal development, with the following consequences:

(i) voiceless /p/, /t/, /k/ were regularly written *p*, *t*, *c*: e.g., *cepister*, *scribenn*, *calam* or MW *twrch* /turx/ 'boar', *pallu* /paɬü/ 'cease'.

(ii) /b/, /d/, /g/ were generally written *b-*, *d-*, *g-* in unmutated initial position (e.g. *bacl*, *grad*) but (occasionally doubled) *p*, *t*, *c* after a vowel (e.g. *loc*, *cepister*, *bacl* or OW *catteiraul* = Mod. *cadeiriol* 'pertaining to a chair') as well as in lenited initial position, where they arose through voicing of /p-/, /t-/, /k-/: e.g., OW *ha'i cenetl* /ai genedl/ 'and his kin' (leniting *i* 'his' plus *cenetl* /kenedl/).

(iii) /v/, /ð/, /ɣ/ are written *b*, *d*, *g* in all positions: e.g., *scribenn*, *grad* or OW *o diued* /o ðiweð/ 'in the (lit. from) end' comprising the leniting preposition *o* plus *diued* /diweð/.

(iv) /m/ and /ṽ/ were both written *m*, the former sometimes being doubled internally: e.g., OW *cam* /kam/ 'step', pl. *cemmein* vs. *calam* /kalaṽ/, *nimer* /niṽer/ 'number' (< Lat. *numerus*).

4.3 By the beginning of the Middle Welsh period this system had undergone two significant modifications. The first was general loss of /ɣ/ (> *y* after a liquid): e.g., MW *a oruc* 'which he did' (*goruc* lenited after relative *a*), MW *gwedy* /gwedɨ/ 'after' vs. OW *guetig*, MW *lle(e)n* 'literature, learning' < Lat. *legenda* /leɣenda/, MW *ariant* 'silver' vs. OW *argant* /arɣant/. The second was denasalisation of /ṽ/ with the result that it fell together with /v/ < /b/ by lenition.

Orthographical experimentation seems to have been encouraged by the shift from an Insular to a Continental style of writing around the end of the eleventh century (see Lindsay, 1912, 32-9) in the wake of Norman penetration

into Wales. For instance, Middle Welsh spelling was characterised by various new ways of representing the voiced fricatives. In the case of /v/ this entailed abandonment of the OW *b* (or *m*) spelling in favour of *u/v*, *w*, *f* (the modern standard) or even *ff* on occasion: e.g., MW *calaw* or *calaf* /kalav/ 'reeds' and singulative *keleuyn* /kelevɨn/ 'reed', *niuer* /niver/ 'number', *aval* or *aual* 'apple, knob' (OW *abal*), *rywedawt* or *ryuedawt* 'wonder' (Mod. *rhyfeddod*), *diulann-*, *divlann-*, *diflann-* or *difflann-* 'disappear' (Mod. *diflannu*), *ulwyd* /vluid/ (lenited form of *blwyd* 'year'), *uawr* or *vawr* /vaur/ (lenited form of *mawr* 'great'). The Old Welsh practice of spelling /ð/ *d* was mostly continued but *t* and sometimes *th* are found in certain manuscripts and occasional instances of *dd* (the modern solution) also occur: e.g., *cletyw*, *cledyf* or *cleddyf* /kleðɨv/ 'sword', pl. *cledyueu* 'swords', *ford*, *fort* or *forth* 'way' (Mod. *ffordd*), *oed*, *oet* or *oeth* /oið/ 'was' (OW *oid*, Mod. *oedd*), *argluit*, *argluid*, *argluyd* or *arglwyd* 'lord' (Mod. *arglwydd*), *dy divet* /də ðiweð/ 'thy end' (lenited form of *diwed* /diweð/ 'end').

The voiceless stops continued to be spelt as in Old Welsh except that *k* was used alongside *c*, especially at the beginning of words before *e*, *i* or *y*: e.g., *kyflym* or *cyflym* 'swift', *kebystr* or *cebystr* 'halter'. There was a marked tendency to spell the voiced stops *b*, *d*, *g* in internal as well as initial position but in final position the spellings *t* and *c* remained common: e.g., *oet* or *oed* /oid/ 'time' (Mod. *oed*), *mab* /mab/ 'son' (OW *map*, Mod. *mab*), pl. *meib(ion)*, *dreic* /dreig/ 'dragon', pl. *dreigyev*, *modryb(ed)* /modrɨb/ 'aunt(s)' (OW pl. *modreped* with an early example of *d* for *t*), masc. *pedwar* /pedwar/ 'four' (OW *petguar*), fem. *pedeir* /pedeir/, *magwyt* or *magwyd* /maguid/ 'was nurtured'. There was a concomitant tendency, resisted somewhat by the labial, to use *b-*, *d-*, *g-* to spell initial /b-/, /d-/, /g-/ resulting from lenition of /p-/, /t-/, /k-/: e.g., *o'r genedyl* 'of the race' (lenition after fem. article; base *kenetyl* or *kenedyl*) vs. OW *ha'i cenetl* in 4.2(ii), *y wreic deccaf* /dekav/ 'the fairest woman' (adj. lenited after fem. noun; base *tec* /teg/ 'fair') but *y pedestyr* 'to a pedestrian' and *o pedestric* 'on (lit. from) foot' vs. *y bedestric* 'to walking pace' (*Pwyll* 215, 212, 222; leniting prepositions *y/i* and *o* and bases *pedestyr*, *pedestric*).

4.4 The second British lenition (III.4.5) more commonly known as spirantisation made the corresponding voiceless fricatives of voiceless stops unaffected by the first British lenition after a vowel (because they were then either geminate or preceded by a *x* that subsequently became the second element of an *i*-diphthong) or a liquid, whence /p/, /t/, /k/ > /f/, /θ/, /x/. An /f/ that arose by other means, including the adoption of Latin loanwords, is generally written *f* as in OW *finn* 'sticks', *fionou* 'roses'. However, the products of spirantisation are often not distinguished from the corresponding stops in the early orthography, particularly after *r* or *l*, although double spellings and *f* or

ph for the labial, *d(t)* or *th* (and sporadically *ht* or Anglo-Saxon *þ*) for the dental and, most commonly of all, *ch* for the guttural are found: e.g. OW *Grip(p)iud* or *Griphiud* (Mod. *Gruffudd*), OC *gueid*, OW *gueith* or *gueit* (*gueiht* once) /gweiθ/ 'work' (MW *gueith*), OW *gurt* vs. MW *(g)wrth*, OW *paped* or *papeþ* = MW *pa beth*, OW *Tutbulc* /tüdvulx/ vs. *erchim* 'claiming' (MW *erchi*) or *bichan* 'little' (MW *bychan*). In Middle Welsh the spellings *f* (rarely *ff* as in modern orthography) or *ph*, *th* and *ch* are markedly preponderant.

4.5 The sibilant /s/ is regularly written *s* and is sometimes doubled after a vowel, particularly in Old Welsh: e.g., OW *iss* = MW *ys* 'is' or OW *drissi* = MW *drys(s)i* 'thorns'. Since *h* was no longer pronounced in Vulgar Latin, it is not surprising that it could be prefixed to vowels as a silent letter in Old Welsh in addition to representing the phoneme /h/, which is almost invariably its function in Middle Welsh orthography: e.g. OW *ha(c)* = MW *a(c)* /a(g)/ 'and', OW *hep* = MW *heb* /heb/ 'said'.

The labial nasals /m/ and /v̄/ (> /v/) have been discussed in 4.2-3. Dental /n/ is regularly written *n*, geminate /nn/ being frequently so spelt intervocalically or in postvocalic auslaut: e.g., OW *finn* (MW sg. *f(f)on(n)*) and *fionou* (MW sg. *f(f)ion*) in 4.4, MW *nant* 'valley', OW names *Cinhilinn* and *Numin*. Guttural /ŋ/ may be written *n* before a guttural stop but otherwise *ng* or *g* are used: e.g., MW *kyfranc*, *kyfrangk* or *kyfrang* /kəvraŋk/ 'meeting, adventure', *llog* or *llong* /ɬoŋ/ 'ship'. The aspirated nasals /mʰ/, /nʰ/, /ŋʰ/, which are the peculiarly Welsh outcome of non-final /mp/, /nt/, /ŋk/ including the 'nasal' mutation of initial /p-/, /t-/, /k-/, may be written *mp*, *nt*, *(n)gc/k* (especially initially) or *mh*, *nh*, *(n)gh*: e.g., MW *pymhet* /pəmʰed/ 'fifth' (OW *pimphet*; base *pymp* 'five'), *vym penn* /və mʰen/ 'my head', *breenhined* /breenʰineð/ 'kings', *yn ty* /ə nʰɨ/ 'in (the) house', *agheneu* /aŋʰeneü/ 'necessities'. In internal position this aspiration is only retained in Modern Welsh directly before the stress, which was regularly penultimate in words of more than one syllable and is here indicated by bold italics. Hence such alternations as *brenin* 'king' vs. *brenhinoedd* 'kings' or *brenhines* 'queen', *angen* 'need' vs. *anghenion* 'needs', or *dant* 'tooth' and *dannedd* 'teeth' (not **danhedd*). This change can hardly have happened before the shift from final to penultimate stress dated to the eleventh century by Jackson (*LHEB* 682-9) but more cogently 'at least as early as the IX century' by Arwyn Watkins (1974, 11). Middle Welsh offers conflicting evidence with variations in spelling like *bre(e)nnin* or *brenhin*, *a(n)ghen*, *danhet* or *danned*, *angklad* or *aglad* 'burial' but the probability is that that the spellings without *h* reflect actual pronunciation, those with it being merely conservative and perhaps due in part to the influence of forms with a further syllable (Arwyn Watkins, 1974, 4).

As a rule voiceless and voiced liquids were not differentiated in Old Welsh orthography except insofar as non-initial unlenited *l* was sometimes written *ll*: e.g., *guollung* 'release' but *luidt* = MW *llwyth* 'clan'. In Middle Welsh the two *l*-sounds were mostly distinguished as *ll* (or the ligature *ll* in the Red Book of Hergest to distinguish it from double voiced *l*) and *l* respectively but *r* continued to be written for both sounds, use of *rr* or *rh* for the voiceless phoneme first occurring in the 15th. and 16th. century: e.g., *callon* 'heart' (double voiced *l*; Mod. *calon*), *lynn* or *llynn* 'pool' (Mod. *llyn*), *gallu* 'ability' (Mod. *gallu*), *llosc* /ɬosk/ 'burning' vs. lenited *heb losg* /losk/ 'without burning', *ran(n)* 'part' (Mod. *rhan*), *araf(f)* 'slow' (Mod. *araf*).

The semivowels /y/ and /w/ are written *i* and *u* in Old Welsh (bearing in mind that MW /w/ continues OW /ɣw/ as well as lenis /w/, both spelt *gu*), *i* or sometimes *y* and *w*, *u* or *v* in Middle Welsh: e.g., OW *iar*, MW *iar* or *yar* /yar/ 'hen', MW *dinion* or *dynion* /dənyon/ 'men', OW *petguar*, MW *pedwar* 'four', OW *neguid*, MW *newyd* 'new', MW *kyveir* or *kyweir* 'fit state', *gwelet* or *guelet* 'see'.

4.6 The evolution of a British vowel system without phonemic distinctions of length by the time of the Old Welsh period is discussed in chapter six. High central /ɨ/ probably arose around the beginning of the Old Welsh period and did not coexist with mid-high front /ɪ/ for long before the two merged as /ɨ/ in Welsh but /ɪ/ in Cornish and Breton (VI.3.6 and 4.6). The other significant difference between the two was an additional mid-low rounded /ɔ/ phoneme in Old Cornish and Breton that was then fronted to /ö/ (VI.4.4-6).

In Old Welsh the vowels /i/ and /ɨ/ were both written *i*, the vowels /e/, /a/, /o/ were spelt *e*, *a*, *o* respectively, and the letter *u* represented both /u/ and /ü/. Only in West British did /i/ and /u/ develop the mid central allophones unrounded [ə] and rounded [ə] respectively in pretonic syllables, i.e. non-final ones since word-final stress was the norm in early Old Welsh. The former is generally written *i* and the latter *i*, *e*, *o* or *u* in Old Welsh: e.g., OW proclitic article *ir* /ər/ (MW *yr* usually), OW *cimadas* /kəṽaðas/ 'fitting' (MW *kyfadas* etc.), *celeell* 'knife' (MW *kyllell* etc. /kəɬeɬ/; < Lat. *cultellus*), *comoid* /kəṽoiθ/ 'power' (MW *kyuoeth* etc.), *Huwel* (MW *Hywel*). Both sounds had fallen together as [ə] by Middle Welsh, where they were spelt in the same way as /ɨ/, namely *y* but sometimes *i* or *e*: e.g., vn. *kymryt* or *kemryt* /kəmrɨd/ 'take', pret. *kymerth* or *kemyrth* /kəmɨrθ/ 'took', *dyn* or *din* /dɨn/ 'man', pl. *dynyon* or *dinion* /dənyon/ 'men'. The trend, then, was towards a distinction between *y* = /ɨ/, [ə] on the one hand and *i* = /i/ on the other: e.g., OW/MW *hir* /hir/ 'long', MW *hin* /hin/ 'weather' vs. OW *hinn*, MW *hin* or usually *hyn(n)* /hɨn/ 'this'. There was a parallel tendency towards a distinction between *w* = /u/ and *u* or *v* = /ü/ but spellings *u* and *v* for /u/ are not uncommon; e.g., MW *crum* or usually *crwm* /krum/ 'crooked', MW *kun*, *cvn* or *kwn*, *cwn* /kun/ 'dogs' vs. *hun* /hün/ 'sleep', *un* or *vn* /ün/ 'one', OW *Tutbulc* /tüdvulx/. The spelling of /e/, /a/, /o/ as *e*, *a*, *o* was generally retained, as is clear from plenty

of examples above.

The *i*-diphthongs are spelt *ai, ei, oi, ui* in Old and usually *ae* (sometimes *ay*), *ei* (rarely *ey*), *oe* (sometimes *oy*), *wy* respectively in Middle Welsh: e.g., OW *hair*, MW *aer* 'slaughter', MW *guayt* or *gwaet* /gwaid/ 'blood', OW *gurehic*, MW *gwreic* or *gwreyc* /gwreig/ 'woman', OW *coit*, MW *coit*, *coyt* or *coet* /koid/ 'wood', OW *luidt*, MW *luith* or *llwyth* 'clan'. The *u*-diphthongs /au/, /eu/, /iu/, /ɬu/ were spelt *au, eu, iu, iu* in Old Welsh with a marked tendency towards *aw, ew, iw, yw* in Middle Welsh: e.g., OW *lau*, MW *llau*, *llav* or *llaw* /ɬau/ 'hand', MW *bleu*, *blev* or *blew* /bleu/ 'hair', OW *liu*, MW *(l)liw* /ɬiu/ 'colour' but MW *byw* /bɨu/ 'alive' and *bywhau* [bəuhaü] '(to) animate'. The Old Welsh diphthong /oü/ became /eü/ in Middle Welsh and was spelt accordingly: e.g., OC *iouenc* vs. MW *ieuan(g)c* /yeüaŋk/ 'young', OW *ois-ou* /-oü/ 'ages' vs. MW *kerd-eu* /-eü/ 'poems'.

5.1. OGAM IRISH. As mentioned in 1.1, the earliest attested method of writing Irish is the Ogam alphabet normally written on a line formed by the edge of a stone and originally consisting of one to five notches on the line (the vowels A, O, U, E, I), one to five horizontal strokes to the right (B, L, F, S, N) or left of it (H, D, T, C, Q) and one to five diagonal strokes across it (M, G, NG, Z, R; McManus, 1991, 1-2). McManus (1991, 6-41) offers a judicious discussion of the alphabet's origins from which it emerges that it was almost certainly based upon the Roman alphabet, that its deployment of twenty signs in four basic groups of one to five obviously had a numeric basis (see Gippert, 1992, 29-31 for an interesting Maldive parallel) and that it was probably devised in the fourth century A.D. 'The fact that Pope Celestine sent Palladius as first bishop to Ireland in the year 431..... suggests the existence, in all probability in the south of the country, of an established Christian community at that time. Given that the Christian religion is a book-based one and required reading skills in Latin, it is possible that this was the locus of the creation of the alphabet. On the other hand, Irish colonies were being established in Wales probably in the fourth century... and these may have provided the link with Latin learning..... At any rate archaeological evidence shows that Ireland was by no means cut off materially from the Roman world at the time in question..... and there is no difficulty in assuming cultural contacts of the kind which would have provided the environment and stimulus for the creation of the Ogam alphabet' (McManus, 1991, 41).

The inconclusive debate about quite how or why the sounds were arranged as they are need not concern us here but a more recent discussion of the original value of some of the signs by McManus (1986; cf. 1991, 30 and 34-40) is highly germane to the purpose of this chapter and must now be considered. The values given above for the Ogam symbols are those ascribed by a considerably later manuscript tradition. Since it follows from a number of

features such as the omission of an equivalent of Latin *p* and innovatory phonetic pairings like D/T, C/Q that the creators of this alphabet were not slavishly imitating a Roman original and had a practical concern with the sounds of Primitive Irish (which had no /p/, for example; II.1.5), it is reasonable to suppose that all of the signs had real equivalents in roughly fourth-century Irish and that deviations from this principle are due to the later substitution of more modern values.

In fact, this has been recognised in the case of F, which has long been transcribed V because this is its Latin equivalent on bilingual inscriptions (mostly from Wales) and /f/ had hardly arisen from /w/ in certain positions as early as the fourth century (V.2.2). An obvious catalyst for such later reanalysis as this was historically regular change of the initial of the name of the letter, in this case *fern* 'alder' < **wernā* (cf. MW *gwern(en)*). A possible counter-example is provided by the manuscript tradition's recognition of a distinction between C and Q lost in speech in the sixth century A.D. at latest (IV.3.4). However, once the initials of these two letters' names, *coll* 'hazel' (MW *coll-en*) < **kollo-* < **koslo-* and *cert* (no doubt originally the same word as W *perth* 'bush', Lat. *quercus* 'oak') < **k^{w}erto-* (< **k^{w}erxto-* < **k^{w}erk^{w}-to-* < **perk^{w}-*; II.1.5b), had become identical as a result of this development, the obvious way of differentiating two inherited symbols for the same *k*-sound was to avail of the two letters in common use for /k/ in the Roman alphabet, namely C and Q. In this case the outcome is coincidentally suggestive of the original values /k/ and /k^{w}/ despite a sixth-century merger of these two phonemes as /k/. Like F, the signs H, NG and Z seem unlikely to have been devised to represent the sounds ascribed to them in the manuscript tradition. Since /h/, /ŋ/ and /z/ were hardly distinct phonemes in fourth- or fifth-century Irish, these values may be suspected of being 'cosmetic and Latin-based..... chosen on the basis of the contemporary forms of their letter names' (McManus, 1991, 34). The original values may have been /y/, /g^{w}/ and /s^{l}/ or the like (on the way from *st* to *s(s)*) but as yet this hypothesis cannot be directly tested because these 'three characters..... are not reliably attested at all' (McManus, 1991, 33) on available inscriptions.

A problem that does not seem to have been directly addressed so far is posed by two to four attestations of DEGO(S) or the like (Ziegler, 1994, 165-6), which undoubtedly corresponds to OIr. *D/dego*, the gen. sg. of *i*-stem *D/daig* occurring both as a personal name and as a word meaning 'flame, fire' < PC **deg^{w}-i-s* (PIE root *d^{h}eg^{wh}* as in Skt. *dah-a-ti* 'burns' etc.). McManus' theory that the sign conventionally transcribed NG originally represented /g^{w}/ was suggested by Cowgill's (1980) irrefutable demonstration that the Proto-Celtic phoneme *g^{w}* (< PIE *g^{wh}*) survived in Irish for as long as *k^{w}*, both then being concurrently simplified to *g* and *k* respectively in the sixth century A.D. (II.1.2). This, however, seems hard to square with the reading DEGO(S) rather

than (in conventional transcription) *DENGO(S) on two to three inscriptions that appear to predate the apocope and anyway also contain MAQI '(of) son' with preserved /k^{w}/. If the forms are read /deg^{w}ō(s)/ in accordance with Cowgill, then it must be concluded that the sign G represented both /g/ and /g^{w}/, in which case NG hardly stood for the latter. The alternative of reading them as /degō(s)/ would imply that /g^{w}/ was simplified to /g/ somewhat earlier than /k^{w}/ to /k/, which would not only spoil the neat parallelism of Cowgill's construct but also accords ill with the need to locate each of these reductions after both raising and lowering (IV.2.1b/c and 3.4). However, a way out of this impasse would be the *a priori* reasonable assumption that both /g^{w}/ and /k^{w}/ were first dissimilated to /g/ and /k/ before a following rounded back vowel (i.e. *u/ū* or *o/ō*), then rounded a following *a* and *i* to *o* and *u* respectively (IV.3.4), and finally were simplified in all other environments. Some support for this hypothesis may be found in QUNACANOS, on which Ziegler (1994, 224) remarks: 'The <Q> can hardly be an archaising spelling here because the inscription is to be dated to the time of vowel raising and lowering (see also CUNALEGI). According to Korolev... the sign <Q> stands for a /k/ labialised by the following *-u-*. However, CUNALEGI without the alleged labialisation is also attested on the same inscription.' McManus rightly posits hypercorrect Q for C here because the difference between them had already been lost in front of /u/ before lowering and corroborates this with the observation that 'the Wroxeter inscription (xxi **CUNORIX MACVS MAQUI-COLINE**) shows that the labial in /k^{w}/ (Q in Ogam) was lost earlier before back than before front vowels' (1991, 90). All that we now need to do in order to solve the problem of DEGO(S) is extend this rule to /g^{w}/, cases like TRIA MAQA '(of the) three sons' or INEQAGLAS indicating a restriction of its operation to position before a rounded back vowel.

5.2 The phonemic system below probably applied at the beginning of the Ogam period when lenition and palatalisation, although no doubt present and/or developing at allophonic level, had not yet obtained phonemic status and so were given no written recognition.

voiceless stops:		t	k	k^{w}	
voiced stops:	b	d	g	g^{w}	
sibilants:	s	s^{t}			
nasals:	m	n			
liquids:	r	l			
semivowels:	w	y			
short vowels:	i	e	a	o	u
long vowels:	ī	ē	ā	ō	ū
diphthongs:			ai	oi	

Allowing for use of the digraphs AI and OI to spell the two diphthongs, we find fifteen consonant phonemes, to each of which (in the likely event that McManus is right) a separate Ogam sign corresponded, and five pairs of short and long vowel phonemes, each represented by a single bivalent sign without regard to distinctions of length securely inferred from a comparison between Old Irish and other Celtic and Indo-European languages. Unlike its Old Irish counterpart Ogam orthography distinguishes between non-initial voiced and voiceless stops as in MAQI-DEC(C)ED(D)A(S) vs. OIr. *Mac-Deichet* /mak dex ´əd/ or TOGITTACC vs. OIr. *Toicthech* /tog ´θ ´əx/.

The fifth and sixth centuries to which the vast majority of the older inscriptions seem to belong were, of course, a time of cataclysmic change for Irish, the most important result being the phonemicisation of lenition and palatalisation in the wake of the loss of certain final consonants and the subsequent reduction or loss of final vowels around the middle of this period. Nevertheless, neither of these crucial innovations was recognised by a system of orthography with already established basic conventions. Geminate spellings of consonants are notoriously frequent on Ogam inscriptions but efforts to link them with an opposition between unlenited and lenited variants must be deemed to have failed. For instance, Harvey's (1987) attempt at establishing a correlation between geminate spelling and unlenited pronunciation by means of statistical prestidigitation is invalidated by an apparently inadvertent geographical bias in his sample (Ziegler, 1994, 4-5) and by the arbitrary exclusion of by far the commonest words in the corpus with an unlenited stop, namely MAQ(Q)I later MAC(C)(I) (OIr. gen *maic*) and MUC(C)OI (OIr. *moccu*), which both occur a good deal more frequently with a single Q/C than with a double QQ/CC and thus firmly contradict his rule. McManus (1991, 125) is clearly right to emphasise 'the capricious nature of the phenomenon' as demonstrated by variation such as that between LUGUDECCAS and LUGUDECA (OIr. gen. *Luigdech* /luɣ ´ð ´əx/), CATTUVVIR, CATTUVIR and CATVVIRR (OIr. gen. *Caithir* /kaθ ´ər ´/) or by the fact that 'of four examples of the name related to OI *allaid* with geminate *ll* and a lenited dental only one (250 ALLATO) has LL and the others (215 ALATTO, 5 ALATTOS and 224 ALOTTO) have TT' (1991, 126) and so on.

Since such variants are not otherwise distinguished by Ogam, it would be remarkable if the difference between [s] and its lenited allophone [h] had been given orthographic expression, particularly in view of McManus' convincing argument that the sign designated H in the later manuscript tradition can hardly have represented [h] on the early inscriptions and may well have been devised for the subsequently lost phoneme /y/. Consequently there is no reason to suppose that DEGOS, ALLATOS above represent [-ōs] rather than [-ōh] or MAQI-DECCEDDAS [-as] rather than [-ah] and so on. It is clear that a final *-h* was still present when unstressed long vowels were shortened except before *-h* by IV.2.1

and that it had disappeared (IV.4.2) when short final vowels, including those once followed by *-h*, were lost by the apocope of c. 500 A.D. (IV.4.3). The change *-h* > Ø is presumably represented by Ogam spellings such as DEGO, ALATTO implying /-ō/ and MAQI-DEC(C)EDA implying /-a/. Obviously a three stage development *-s* > *-h* > Ø between the earliest Ogam inscriptions probably dating from around the beginning of the fifth century and some time before the apocope roughly at its end is more of a squeeze than straightforward *-h* > Ø in the half century or so in question. The likelihood is, then, that postvocalic -S on Ogam inscriptions represented *-h* (or even on occasion Ø) and that its omission reflected loss of *-h* in auslaut as a rule. Various other fifth- and sixth-century developments such as raising or lowering of vowels and k^w > *k* that are sometimes reflected in Ogam spelling will be discussed in chapter four.

6.1. OLD IRISH. Before the end of the Ogam period the system in 5.2 had (with the exception of a phoneme in square brackets) been transformed into the following phonemic inventory of the early and classical Old Irish known from manuscript sources written (like Old Welsh; see Arwyn Watkins, 1966) in an insular version of standard Latin script from the later seventh century onwards (the *o*-diphthongs in round brackets had apparently merged with the corresponding *a*-diphthongs by the end of the seventh century).

non-palatal voiceless stops:	p	t	k		
palatal voiceless stops:	p´	t´	k´		
non-palatal voiceless fricatives:	f	θ	x		
palatal voiceless fricatives:	f´	θ´	x´		
non-palatal voiced stops:	b	d	g		
palatal voiced stops:	b´	d´	g´		
non-palatal voiced fricatives:	v	ð	ɣ		
palatal voiced fricatives:	v´	ð´	ɣ´		
sibilants:	s	s´			
aspirate:	h				
non-palatal nasals:	m	m̃	N	n	[ŋ]
palatal nasals:	m´	m̃´	N´	n´	[ŋ´]
non-palatal liquids:	R	r	L	l	
palatal liquids:	R´	r´	L´	l´	
short vowels:	i	e	a	o	u
long vowels:	ī	ē	ā	ō	ū
diphthongs:			ai	oi	ui
	iu	eu	au	(ou)	
	īu	ēu	āu	(ōu)	
	ia				ua

As a result of the phonemicisation of palatalisation and lenition the number of consonant phonemes shows a remarkable threefold increase from just fifteen in 5.2 to forty five here. Acceptance of Thurneysen's doctrine that there was a third series of velarised or '*u*-quality' consonants in addition to palatal and non-palatal (*GOI* 96-7) would add a further twenty two phonemes, while his postulate of moribund phonemic gemination of stops, nasals, liquids and *s* in Old Irish (*GOI* 89-91) yields a further twenty to produce a grand total of no less than eighty seven consonant phonemes. As Greene (1956 and 1962) has pointed out, not only is this a typologically incredible number to occur in conjunction with a full system of five short plus five long vowels and an appreciable number of diphthongs but there is no good empirical evidence for either of these two alleged extra phonemic contrasts in the synchrony of Old Irish. The obvious solution, then, is not to recognise them and to add just four (soon reduced to three) short *u*-diphthongs to the inventory as an equally effective and eminently economical substitute for the twenty two velarised consonants otherwise required. Phonemicisation of [ŋ] resulted from simplification of *ng* [ŋg] to *ng* /ŋ/ before or early in the Old Irish period.

6.2 The main areas of innovation in Old Irish orthographic practice as compared with the spelling conventions of Ogam were:

(a) A distinctly limited tendency to use geminate spellings to indicate non-lenition of nasals and liquids or even of voiced stops and *s* on occasion.

(b) The development of devices for indicating vowel length, namely an abortive experiment with geminate spelling or the ultimately successful alternative of writing a superscript ´ probably derived from the Latin apex, neither of them used at all consistently.

(c) More or less regular use of the Latin digraphs *th*, *ch* and less frequently *ph* to distinguish the voiceless fricatives from the corresponding voiceless stops.

(d) Use of *p*, *t*, *c* to represent postvocalic (and, optionally, post-consonantal) internal /b/, /d/, /g/ owing to the effects of the first British lenition upon the pronunciation of Latin as well as the vernacular in Britain (4.2).

(e) A move towards employing vowel signs, more frequently in some contexts than in others, as indicators of palatal and non-palatal consonant quality.

A separate section will be devoted below to a more detailed discussion of each of the above along with any related matters deemed worthy of attention.

6.3 Although quite well attested in Ogam (e.g. DECCEDDA /dexeda/, ALATTO /alaθō/ in 5.2 or COILLABBOTTAS [koilavoθah] = OIr. gen. *Coílboth*, COMMAGGAGNI /coṽaɣaɣni/ = OIr. gen. *Comgá(i)n*), geminate spellings of the lenited counterpart of a stop, liquid or nasal are rare indeed in Old Irish orthography, a mere handful of examples having been noted in seventh-century Latin texts in the Book of Armagh (references to Bieler, 1979): e.g., *Bregg* (Muirchú

I 14,2; standard *Breg* /breɣ/), *Roddanus* (Tírechán 7,1; OIr. *Rúadán* /ruaðān/), *Coimmanus* and *Connanus* (7,2; OIr. *Coímán* /koiṽān/ and *Conán* /konān/; see Carney, 1978/9, 419-21, and McManus, 1986, 9).

Optional doubling of unlenited stops, liquids and nasals is a feature of both Ogam and Old Irish (to say nothing of Old Welsh; 4.2) orthography. In the case of (*pp*), *tt* and *cc* for internal postvocalic (/p/ or /b/,) /t/ or /d/ and /k/ or /g/ such duplication was trivial since the corresponding lenited sounds were normally spelt *f/ph* and *b*, *th* and *d*, *ch* and *g* respectively: e.g., OIr. *bec* or *becc* /beg/ 'small' (Mod. *beag*), *mac* or *macc* /mak/ 'son' (Mod. *mac*), nom. sg. *ette* /et´e/ 'wing' (Mod. *eite*) vs. dat. pl. *itib*. Occasional spellings of a voiced stop as *bb*, *dd* or *gg* in this environment such as the Book of Armagh's *ardd* /ard/ 'high' (*Thes.* II 242.17; Wb./Ml. *art* or *ard*) and acc. *abbaith* 'abbot' (*Thes.* II 242.21; Wb. dat. *apid* /abəð´/) may be vestiges of Ogam usage.

Since /v/, /ð/, /ɣ/, /ṽ/, /n/, /r/, /l/ were almost invariably represented by single *b*, *d*, *g*, *m*, *n*, *r*, *l* respectively in Old Irish (as in Old Welsh; 4.2) orthography, the geminate spellings *bb-*, *dd-*, *gg-*, *mm*, *nn*, *rr*, *ll* were useful as a virtually unambiguous way of indicating the unlenited counterparts /b-/, /d-/, /g-/, /m/, /N/, /R/, /L/. In initial position after a proclitic *b*, *d* or *g* could represent /b/ or /v/, /d/ or /ð/, /g/ or /ɣ/ but, nonetheless, unambiguous geminate spellings such as *nu:ggabad* /nu gavəð/ 'he might take' (*Thes.* II.242.7; standard *no:gabad*), *du:bbert* /du bert/ 'conferred' (*Thes.* II 241.16 and 242.18; Ml. *do:bert*) vs. rel. *du:bert* /du vert/ 'who conferred' (*Thes.* II 242.9) in the Book of Armagh are rare in texts from the Old Irish period. On the other hand, the doubling option was employed a good deal more frequently after vowels in the case of the nasals and liquids: e.g., *lám* /Lāṽ/ 'hand' (Mod. *lámh*) but *lom* or *lomm* /Lom/ 'naked' (Mod. *lom*), *glan* /glan/ 'clean' (Mod. *glan*) but *cenn* /keN/ 'head' (Mod. *ceann*), *du:luith* or *du:lluid* /du Luð´/ 'came', *fo:cicherr* or *fo:cicher* /fo kix´əR/ 'will put'.

6.4 Gemination would seem to have been the first device employed in order to distinguish a long from a short vowel. Thus the seventh-century Cambrai Homily mostly leaves vowel length unmarked but sometimes indicates it by doubling: e.g., *is ee* (*Thes.* II 246.6) or *iss e* (246.33) /is ē/ 'it is', *ood* /ōð/ 'from him' (244.25), *baanmartre* /bānṽartre/ (246.30) or *banmartre* (247.1). The superscript generally employed to denote length in Old and Middle Irish from the main Würzburg glossator onwards seems to have been still an experimental device for his 'prima manus' predecessor: e.g., *tú:ercómlássát cómtínól* (Wb. 7ª7; standard OIr. *do:erchomlaiset comthinól*), where length was clearly not the criterion as only the non-initial stressed vowel of the deutero-tonic compound verb is not so marked. Typical examples of what then became standard, but still optional, usage from the main hand are *is hé* /is ē/ and *dígal* vs. (Ml.) *digal* /dīɣəl/ 'vengeance', while compromises between the moribund doubling and the rising superscript system are also found on occasion: e.g., Wb. *gabáal* 'taking' alongside *indocbál* 'glory', *báas* alongside *bás* 'death', *láam* 'hand' alongside Ml. *lám* or *lam*, Arm. *cuúrsagad* (*Thes.* II 242, 11) alongside Wb. *cúrsagad* 'reproaching' (*GOI* 20-1). In the common enough event that length is not indicated in the manuscript(s), editors normalise by writing the standard length mark (e.g. *lám* for ms. *lam* or *lám*) or a macron (e.g. *lām* for ms. *lam* vs. *lám* for ms. *lám*).

6.5 As Harvey (1989) points out, the digraphs (*ph*,) *th*, *ch* normally used to spell Old Irish (/f/), /θ/ and /x/ were employed in Latin orthography but hardly represented voiceless fricatives there. Given that the spellings with *h* were not yet firmly established in the Würzburg 'prima manus', which may also (e.g. Wb. 7ª7 in 6.4 above) use ambiguous *t*, *c* as in Ogam orthography, he goes on to suggest that the second British lenition of /p/, /t/, /c/ to /f/, /θ/, /x/ (III.4.4) might perhaps have led to words like *pulcher* and *bracchium* being pronounced /pulxer/ and /braxium/ in British Latin (cf. *uache* = Lat. *vaccae* 'cows' in the *Surrexit* memorandum; Jenkins and Owen, 1984, 103). This could then have paved the way for association of the potentially unambiguous *h* with the voiceless fricatives first in Britain and then in Ireland, although an Irish origin can scarcely be ruled out in view of the earlier development of voiceless fricatives in Goedelic. Be that as it may, the practice was only just beginning to establish itself in Old Irish orthography by the later seventh century on the evidence of the Würzburg 'prima manus'.

One might add that the Cambrai Homily mostly uses *c* for /k/ and *ch* for /x/ but also has several examples of *ch* for /g/ (internal /g/ or nasalised /k/) and *c* for /x/: e.g., *din cenelu* (*Thes.* II 244.23-4; standard *din chenélu*), *tre cenele* /tre xen´ēle/ (247.21) vs. *tre chenelæ* (246.27), acc. *a chruich* /a xrux´/ (245.5), *diltuth* /dīltuθ/ (245.7) and so on; *i chomus* /i gomus/ (244.30; *i com(m)us*), *ar chruche* /ar grux´e/ (245.11; *ar cru(i)che*), *loch* /log/ (245.36; *loc(c)*), *tond:echomnuchuir* /tond egəṽnəgər´/ (247.11-12; *dond:ecomnacair*) vs. *bec* /beg/, gen. pl. *inna cloen* /iNa gloin/. Although the homily seems to have been 'transcribed - with every misreading which the Irish script could suggest - by a Continental copyist ignorant of Irish' (*GOI* 9), the *ch* for /g/ in particular can hardly be due to this. It thus looks as though this seventh-century composition had not yet rigidly differentiated the spellings with and without *h* (cf. Wb. *prima manus*) in the case of the gutturals at least but nevertheless showed a marked preference for *ch* to spell what would otherwise be *c* representing /g/ or /x/. This suggests that *p* and *ph*, *t* and *th*, *c* and *ch*, having been inherited as mere variant spellings of /p/, /t/ and /k/ in Latin, may first have been diffe-rentiated in Irish by the expedient of simply continuing to use basic *p*, *t* and *c* for the voiceless stops while using spare *ph*, *th* and *ch* to spell

their 'mutations' /b/, /d/, /g/ and /f/, /θ/, /x/. Whereas the experiment with *ch* = /g/ (either as a nasalisation of initial /k/ or as a variant /g/ of internal *c* /k/) and so on proved abortive, use of *ph* (alongside *f* and allowing for a reluctance to mutate initial *p-* as it was confined to loanwords; V.5.1), *th* and *ch* had established itself as the overwhelmingly normal method of representing the voiceless fricatives by the time of the roughly mid-eighth-century Würzburg main glossator and has been basically continued ever since: e.g., OIr. *pridchim* /priðˊxˊəmˊ/ 'I preach', *do thab(a)irt* /do θavərˊtˊ/ 'for giving' (unlenited base *tab(a)irt*), *étach* /ēdəx/ 'clothing', *ata chomarpi* /ada xoṽərbi/ 'who are heirs' (unlenited base *comarpi*).

Since /x/ was the only phonotactically permitted guttural before /t/ by virtue of II.1.5(a), there was no phonemic opposition between /k/ and /x/ in this environment with the result that a *c* spelling was unambiguous and survived as an uncommon variant of *ch* here even in sources from the eighth century and later: e.g., Cambrai acc. pl. *s(c)lictu* /slixtu/ 'footsteps' (*Thes.* II 244.32; Sg. *sliucht*), *rectire* /rextərˊe/ 'steward' (Wb. 17^{d}13 'prima manus'; Sg. *rechtaire*), Wb. main hand *act* or *acht* /axt/ 'but'.

6.6 The establishment of a British-style pronunciation of Latin in Irish clerical circles would have been a natural enough consequence of a fifth- and sixth-century process of Christianisation in which British missionaries played a decisive part, and Latin loanwords such as OIr. *loc(c)* /log/ 'place' (< Lat. *locus* pronounced /loguh/ in the British manner as in 4.2 above; ModIr. *log*) supply plenty of good evidence for just such a pronunciation.

Since the first British lenition responsible for voicing /p/, /t/ and /k/ to [b], [d] and [g] between a vowel and another sonorant (4.2) had almost certainly not yet taken place at the beginning of this period, one would expect the inventor(s) of the Ogam alphabet to ascribe the phonemes /t/, /k/ and /k^{w}/ plus (once they had arisen) their new (III.4.2) lenited allophones [θ], [x], [x^{w}] to T(T), C(C), Q(Q) and the phonemes /b/, /d/, /g/, /g^{w}/, /s/, /m/, /N/, /R/, /L/ plus their old (III.4.1) lenited allophones /v/, /ð/, /ɣ/, /ɣ^{w}/, /h/, /ṽ/, /n/, /r/, /l/ to B(B), D(D), G(G), 'NG', S(S), M(M), N(N), R(R), L(L). This seems to be exactly what happened (5.2). One would also expect postvocalic *p*, *t* and *c* to have the values /p/, /t/ and /k/ in early loans from British Latin and then be adapted or subjected to the effects of Irish lenition of the last two to [θ] and [x]. This too is borne out by the material: e.g., MidIr. *ortha* 'prayer' < OIr. **orthu* < **oraθiyu* < Lat. *oratio* (/orɔ̄t-/?; cf. VI.2.4), OIr. *cuithe* 'pit' < **k^{w}uθiyah* < Lat. *puteus*.

As McManus (1983) has conclusively demonstrated (VI.2.5), the absorption of Latin loanwords into Irish during the fifth and sixth centuries was a continuous process in the course of which the individual equivalences involved were liable to modifications triggered at various stages by changes in the phonological (and morphological; McManus, 1984) structure of the source

and/or target language. One such change was, of course, British lenitional voicing of the voiceless stops at a time when Irish had a clear phonemic distinction between /t/[θ] and /d/, /k$^{(w)}$/[x$^{(w)}$] and /g$^{(w)}$/ in intervocalic position: e.g., OIr. *cét* /kēd/ 'hundred' (Mod. *céad*) < */kēdan/ (< PC **kantom*; cf. MW *cant*) vs. OIr. *cethair* /keθərˊ/ 'four' < */k^{w}etures/ [k^{w}eθureh] or OIr. *tocad* /togəð/ 'luck' < */togetas/ [togeθah] vs. *tochim(m)* /toxˊəmˊ/ 'gait' < */tokemen/ [toxemen]. It was, then, natural to associate the new British Latin voiced pronunciations with an Irish voiced stop phoneme: e.g., OIr. *loc(c)* /log/ 'place' above, *notaire* /nodərˊe/ < Lat. *notarius* [nodɔ̄riuh], *oróit* /orɔ̄dˊ/ 'prayer' (borrowed later than *orthu* above) < Lat. *oratio* [orɔ̄d-] (VI.2.3b-4 and 2.7), *Notlaic* /nodləgˊ/ 'Christmas' < **nodolig* < Lat. *Natalicia* [nɔdɔlig-] < [nɔ̄dɔ̄lig-] (VI.4.3). These and plenty of other similar examples suffice to show that by some stage in the later fifth century before the general apocope (cf. *notaire* < **nodareya(h)*) the new British Latin fashion of voicing a hitherto voiceless stop between a vowel and another sonorant had established itself in an Irish Church still intimately connected with its British counterpart. In other words, from this time on the pronunciation of Latin in both Celtic Britain and Ireland essentially conformed to the principles adumbrated in 4.2 above.

When, in all probability not long before the middle of the seventh century (McCone, 1989, 72-3), the Roman alphabet began to be used in monastic circles to write continuous Irish texts on vellum, Irish clerical pronunciation of Latin after the British fashion was almost bound to be decisive in the first instance. Thus *b*, *d*, *g* and *m* had the values /b/, /d/, /g/ and /m/ in unlenited contexts (basically in anlaut or after a consonant) but /v/, /ð/, /ɣ/ and /ṽ/ in lenited ones, whereas *p*, *t* and *c* had the values /p/, /t/ and /k/ in unlenited environments but otherwise corresponded to voiced /b/, /d/, /g/. Typical vernacular examples of these rules, which were naturally extended to take in the Irish initial mutations, are *ben* /ben/ 'woman' but *a ben* /a ven/ 'his woman' (Mod. *bean*, *a bhean*), *slíab* /sliav/ 'mountain' (Mod. *sliabh*) but *scúap* /skuab/ 'brush' (< Lat. *scopa* [skōba]; ModIr. *scuab*) and *sop* /sop/ 'wisp' (Mod. *sop*); *deug* /deuɣ/ 'drink' but *mo deug* /mo ðeuɣ/ 'my drink' (Mod. *deoch*, *mo dheoch*), *bodar* /boðər/ 'deaf' (Mod. *bodhar*) but *bot* /bod/ 'penis' (Mod. *bod*) and *brat* /brat/ 'cloak' (Mod. *brat*); *galar* /galər/ 'sickness' but *a galar* /a ɣalər/ 'his sickness', *mag* /maɣ/ 'plain' (Mod. *ma(i)gh*) but *macraille* /magrəLˊe/ 'testicle(s)' (Mod. *magairle*) and *macrad* /makrəð/ 'group of boys' (Mod. *macra(dh)*); *mac* /mak/ 'son' but *a mac* /a ṽak/ 'his son' and *a (m)mac* /a mak/ 'her son', *comadas* /koṽəðəs/ 'fitting' but *com(m)us* /komus/ 'power'; *tech* /tex/ 'house' but *a tech* /a dex/ 'their house' (Mod. *teach*, *a dteach*) and *étach* /ēdəx/ 'raiment' (Mod. *éadach*); *cath* /kaθ/ 'battle' but *i cath* /i gaθ/ 'in battle' and *cocad* /kogəð/ 'war' (/g/ < *-nk-*; *con* + *cath*; ModIr. *cogadh*).

Since postconsonantal position was non-leniting in Irish and, in the first

instance (prior to III.4.4), British, it is not surprising that *b, d, g* can still represent voiced stops there in Old Irish. However, the spellings *b, d, g* not only compete in this environment with less common *p, t, c* (no doubt by extension from their function as spellings of non-intial /b/, /d/, /g/ after a vowel) but also sometimes represent lenited /v/, /ð/, /ɣ/ that came to stand after another consonant as a result of syncope (or, in the case of *b*, /w/ > /v/ after a voiced consonant by III.4.1). For instance, *fedb* /feðv/ 'widow' (< **wiðvā* < **widwā*; MW *gwedw*, Lat. *vidua* etc.) vs. *odb* /oðb/ 'knot' (Mod. *fadhb* '(knotty) problem'); *derc(ad)* /derk(əð)/ '(eye) socket/looking' (Mod. *dearc(adh)*) vs. *derg(ad)* or *derc(ad)* /derg(əð)/ 'red(dening)' (Mod. *dearg(adh)*) vs. *éirge* /ēr´ɣ´e/ 'rising' (< **ēreɣe*; Mod. *éirghe* or *éirí*); *art* /aRt/ 'stone' (Mod. *art*) vs. *ard* or *art* /aRd/ 'high' (Mod. *ard*) vs. *airde* /aR´ð´e/ 'sign' (Mod. *airdhe* or *airí*); *ingen* /iŋ´(g´)ən/ 'nail' (Mod. *ionga*) vs. *ingen* /in´ɣ´ən/ 'daughter' (Ogam INIGENA; Mod. *inghean* or *iníon*). Although it is not possible to establish the precise value of *c* or *g*, say, from a single occurrence, the overall ground rules are that fluctuations between *c* and *g* prove /g/ and that, given an adequate number of attestations, invariable *g* or *c* point to /ɣ/ and /k/. In practice, of course, Modern Irish reflexes and/or etymological considerations often clinch things.

It is to be noted that the position directly after a proclitic counts as anlaut in this context, an 'inlaut' spelling here such as Cambrai *ba calar* /ba galər/ 'it was a sickness' (*Thes.* II 246.15) being quite unusual and contrasting with normal *na galar* /na galər/ 'any sickness' (245.34), *fo:geir* /fo ger´/ 'heats' (246.2) etc. in the same text. The following examples of Old Irish compound verbs should serve to illustrate some basic phonological and orthographic alternations of this type: deuterotonic *as:beir* /as ber´/ 'says' (or lenited relative /as ver´/ 'who says'), *do:beir* /do ber´/ 'gives' (or /do ver´/ 'who gives'), *fo:daim* /fo daṽ´/ 'suffers' (or /fo ðaṽ´/ 'who suffers'), *ad:gair* /að gar´/ 'summons' (or /að ɣar´/ 'who summons'), *fo:gaib* /fo gav´/ 'gets' (or /fo ɣav´/ 'who gets'), *con:tuili* /kon tul´i/ 'sleeps', *do:claid* /do klað´/ 'digs' (lenited rel. *do:chlaid* /do xlað´/ 'who digs', nasalised rel. *do:claid* /do glað´/ 'which he digs') vs. prototonic *-epir* /eb´ər´/, *-tab(a)ir* /tavər´/, *-fodaim* /foðəṽ´/, *-acair* /agər´/, *-fogaib* /foɣəv´/, *-cotl(a)i* /kodli/ (/d/ < *-nt-*), *-tochlaid* /toxləð´/.

6.7 Whereas palatalisation was phonemically irrelevant to the system in 5.2 above held to have been in effect when the Ogam alphabet was devised and so continued to be ignored in Ogam writing even after the apocope had first rendered it phonemic to any significant extent (IV.4.3), seventh-century efforts to forge a new means of writing Irish could hardly ignore so crucial a feature of the sound system (see 6.1) they were trying to capture. The method adopted was to use *a* as a non-palatal off-glide, *e* or *i* as a palatal off-glide and *i* as a palatal on-glide. No glide was written if a back vowel *a/ā*, *o/ō* or *u/ū* was

flanked by non-palatal consonants (C_C), if a front vowel *e/ē* or *i/ī* was preceded by a palatal and followed by a non-palatal consonant (C´_C) or if *i/ī* was flanked by palatal consonants (C´_C´): e.g., nom. *mac* /mak/ 'son', *dán* /dān/ 'gift', *cruth* /kruθ/ 'shape', gen. *crotho* /kroθo/, nom. *slógad* /slōɣəð/ 'hosting', *rún* /rūn/ 'mystery', *tech* [t´ex] 'house', *tét* [t´ēd] 'rope', nom. *mil* [m´il´] 'honey', *fius* /fius/ or *fis* [f´is] 'knowledge' (V.5.4), *síl* [s´īl] 'seed', gen. *síl* [s´īl´].

Since palatalisation of initial consonants (IV.3.3-4) was by and large still a mere allophonic concomitant of a following front vowel or a diphthong with *i/ī* or *e/ē* as first element, there was no call for an off-glide in stressed syllables. In the Old Irish Glosses an on-glide *i* was mostly inserted between a short or long stressed back vowel *a, o, u* (and *ú, éu, úa*, the only non-*i*-diphthongs occurring in this environment) and a following palatal consonant, particularly in closed syllables, but this practice was somewhat less common after the front vowel *e*: e.g., gen. *maic* /mak´/ 'son's', acc. *rúin* /Rūn´/ 'mystery', 3sg. *as:beir* (occasionally *as:ber*; II.5.2) /as ber´/ 'says', nom. pl. *eoin* /ēun´/ 'birds', 3pl. *-taibret* /tav´r´əd/ 'give' (but *-epret* /eb´r´əd/ 'say'), 3sg. *beirth-i* or *berth-i* /ber´θ´i/ 'bears it', 3pl. *as:beirtis* or *as:bertis* /as ber´d´əs´/ 'used to say', ipv. 2sg. *teilc* /tel´g´/, 2pl. *telcid* /tel´g´əð´/ 'throw!' and in an open syllable 3sg. *berid* 'bears', 2pl. *do/as:berid* /ber´əð´/ 'you bring/say', 3sg. *-léici* or *-léci* /lēg´i/ 'leaves', gen. *tuaithe* or *tuathe* /tuaθ´e/ 'kingdom's'. The Cambrai Homily too mostly writes the palatal on-glide after a stressed back vowel in closed syllables but is less consistent in open ones or in the case of stressed *e*: e.g., *airde* /ar´ð´e/, acc. *cruich* /krux´/ twice but gen. *cruche* /krux´e/ three times, gen. *coirp* /cor´p´/, *coicsath* /kog´s´aθ/, gen. *duini* /dun´i/, dat. *duiniu* /dun´u/, *ine chuis* /xus´/, *ine laim* /lāṽ´/ etc., *-secheth(ar)* /sex´əθ(ər)/, *-ber* /ber´/ three times vs. *-beir* /ber´/ twice and *-geir* /ger´/ once (see V.4.2-3 on unstressed vowels in Cambrai). Presumably the practice of writing a palatal on-glide arose before a back vowel first because it was more audible in that environment, e.g. [duⁱn´e], [lāⁱṽ´], and then began more slowly to be used as an indication of palatalisation after /e/, where the non-phonemic on-glide would have been non-existent or at most barely noticeable in pronunciation, e.g. [ber´].

Short preconsonantal unstressed vowels apart from *u* had been reduced to /ə/ not long before the eighth century (V.4.3) and this phoneme was spelt differently according to the quality of the flanking consonants, namely as *a* between two non-palatals (C_C), *e* between a palatal and a non-palatal (C´_C), *i* between two palatals (C´_C´) and *(a)i* with frequently omitted optional off-glide between a non-palatal and a palatal (C_C´): e.g., 3sg. *berid* /ber´əð´/, *-tabir* or *-tabair* /tavər´/, 3pl. *berit* /berəd´/, *(do/as)-berat* /berəd/, *-taibret* /tav´r´əd/, *-epret* /eb´r´əd/. After a palatal consonant an off-glide *i* was usually

written before *-u(-)* and an off-glide *e* before final *-o* or *-a*, an off-glide *a* being less regularly used between a non-palatal consonant and final *-e* or *-i*: e.g., *teilciud* /tel´g´uð/ 'casting', *ro:léicthea* /ro lēg´θ´a/ 'have been left', gen. sg. *doirseo* /dor´s´o/ 'door's', nom. pl. *doirsea* /dor´s´a/ 'doors' (sg. *dorus*), gen. *láme* or *lámae* /lāve/ 'hand's', gen. *sosceli* or *soscelai* /sosk´ēli/ 'gospel's'.

Apart from the short *u*-series, the diphthongs in 6.1 above are not infrequently accompanied by a superscript mark of length in the manuscripts. Modern editorial practice is to write this over the first element except in the case of /oi/, /ai/, and /ui/, where it is written over the second in order to avoid orthographical confusion with /ā/, /ō/ and /ū/ plus palatal on-glide. Hence *áe* or *aí*, *óe* or *oí*, *uí*, short *iu*, *eu*, *au* (*ou*) vs. long *íu*, *éu*, *áu* (*óu*), and *úa*, *ía*. No such consistency is observed in the originals: e.g., *tuath*, *túath* or *tuáth* /tuaθ/ 'kingdom', *óen*, *oén*, *oen* or *oín* /oin/ 'one', *fiadib* or *fíadib* /fiaðəv´/ 'before you/them', gen. *ceniuil*, *ceníuil*, *cenéiuil* or *ceneiuil* /ken´ēul´/ 'kindred's', nom. pl. *beiúil* /bēul´/ 'lips, mouth' (but see V.5.4).

6.8 Loss of *f* (< *w*) by lenition was not normally marked in Old Irish: e.g., Wb. *oinfer* /oin´ər/ 'one man', *ind fir* /ind ir´/ 'the men', Tur. *do foísitin* /do ois´əd´ən´/ 'for confession' as opposed to the quite unusual phonetic spelling *m'oísitiu* /m ois´əd´u/ 'my confession' (Ml. 46^{b}12). Not until later in the period was a compromise between these extremes experimented with by writing a dot or *punctum delens* over the *f* in order to indicate both its lexical presence and non-pronunciation in a given instance such as *a ḟorcomét* 'its (leniting) observation' (Sg. 22^{a}1).

Like /N/, /R/ and /L/, /s/ could be written double initially after a proclitic vowel as well as in postvocalic inlaut or auslaut and there was no consistent attempt at differentiation from its initial lenited variant /h/ normally written *s*: e.g., *soírad* /soirəð/ but *mo soírad* /mo hoirəð/ 'my deliverance', *-ges* /ges/ 'I may pray' or *-geiss* /ges´/ 'you may pray', *uisse* /us´e/ 'fitting'. By the time of the St. Gall Glosses the *punctum delens* could be optionally written over *s* (like *f*) to indicate its lenition to /h/: e.g., *di ṡeirc* /di her´k´/ 'of love' (Sg. 1^{a}2).

Apart from being the lenited counterpart of /s/, the non-lexical and invariably initial phoneme /h/ was also prefixed to an immediately following vowel by a non-leniting proclitic ending in a vowel as in Mod. Ir. *a cheann* 'his head' vs. *a ceann* 'her head' but *a aistear* 'his journey' vs. *a haistear* 'her journey'. Since, however, *h* was no longer pronounced in late Latin, it basically functioned as a silent letter in Old Irish as often in Old Welsh (4.5) orthography and no particular effort was made to associate it with prevocalic /h-/ in Old Irish. Thus the Old Irish ancestors of Modern Irish *is ea* 'it is' and *ní hea* 'it is not' were undoubtedly pronounced /is eð/ and /nī heð/ respectively but may be spelt either *is ed* or *is hed* and *ní ed* or *ní hed*.

The foregoing has sought to highlight the more important features of Old Irish orthography with regard to the phonological reality that lay behind it. Some further details will be found in *GOI* 18-26. The system described above continued in use without significant change, except insofar as this was due to certain phonological developments (V.6.1-4), until the end of the Middle Irish period c. 1200 A.D. Orthographical experimentation in the next four centuries of the Early Modern Irish period as a new standard gradually emerged from the old lies beyond the scope of the present work (see Ahlqvist, *SnaG*, 23-59).

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.

Stops:	**p**	**t**	**$\hat{k}$**	[k]	**k^w**	
	[b]	**d**	**$\hat{g}$**	[g]	**g^w**	
	b^h	**d^h**	**$\hat{g}^h$**	**$[g^h]$**	**g^{wh}**	
Fricatives:	**s**	[þ]				
Laryngeals:	**h_1**	**h_2**	**h_3**			
Sonants:	**y/i**	**w/u**	**r/$\underline{r}$**	**l/$\underline{l}$**	**m/$\underline{m}$**	**n/$\underline{n}$**
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, $\hat{k}^h$, $[k^h]$, 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', $\hat{k}$', k', k^w' or even preglottalised 'p, 't, '$\hat{k}$, 'k, 'k^w for b, d, $\hat{g}$, 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 ($\hat{k}$, $\hat{g}$, $\hat{g}^h$) 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} > 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} > PC *g* apparently provided by W *gori* = OIr. *guirid* 'warm(s)' < causative $*g^{wh}or\text{-}eye\text{-}$ is undermined by an equation such as W *golchi* (< **gwolchi*, 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 **gwor-*, 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 *gwared* 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 Ml.39c24). 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 *gwedi* 'prayer', *gwediaw* '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 $*g^{w}eltis$ cognate with Germanic forms like Gothic *wilþeis* 'wild' < **welþiyaz* on the reasonable assumption of original $*g^{wh}el\text{-}ti\text{-}$ or $*g^{h}wel\text{-}ti\text{-}$.

Supporters of PIE g^{wh} > PC *g* (e.g. Schmidt as reported by Ködderitzsch, 1993, 144, n.19) have sought to evade these uncomfortable facts with the help of some apparent sporadic British occurences of *gw-* rather than normal *g-* < PC *g* < PIE $\hat{g}^{(h)}$ 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' < $*wo\text{-}gaisu\text{-}$ rather than directly with OIr. *gáe*, Gaulish *gaiso-* plus Old Norse *geirr* implying original $*g^{h}ais\text{-}$. That leaves MW *adwaen* 'knows (someone)' = OIr. *ad:géuin* < perfect $*ge\text{-}gn\text{-}e$ (PIE root $*ĝneh_3$), 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 $*d^{h}eg^{wh}$ 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 $*d^{h}eg^{wh}$- 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 **dn̥g^{h}-weh$_2$-*, cf. OLat. *dingua* later *lingua*, Goth. *tuggo* 'tongue') and **angwīn-* (PIE **h$_3$n̥g^{h}-w-*, cf. Lat. *unguis*; Rix, 1970) respectively rather than the otherwise equally viable **tang^{w}āt-* (PIE **dn̥g^{wh}-eh$_2$-*) and **ang^{w}īn-* (PIE **h$_3$n̥g^{wh}-*).

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. *nãgas* and Gk. ὄνυξ, gen. ὄνυχ-ος points clearly to a PIE root noun with amphikinetic accentuation and corresponding ablaut alternation between full-grade strong (e.g. nom. sg. **h$_3$nóg^{wh}-s*) and zero-grade weak (e.g. gen. sg. **h$_3$n̥g^{wh}-és*) stems. Allowing for generalisation of the former, Greek has essentially preserved this paradigm, whereas elsewhere 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 ὀνυχ- points unambiguously to PIE **h$_3$nog^{wh}-* rather than **h$_3$nog^{h}-*. *Ewin* thus supplies proof positive that the Celtic reflex of PIE $*g^{wh}$ 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 $*g^{h}w$. Consequently *deifio* and *nyf* can be taken to continue PIE **d^{h}eg^{wh}-* and **snig^{wh}-*.

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 $*g^{w}h$ 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 postvocalically 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}n̥-* > **g^{w}an-* > **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): **aŋgwīn-* > **aŋwīn-*, whence *ewin* by simplification of ŋ*w* > *w* and *i*-affection. If so, *tauawt*, *tafod* can be covered by positing (ŋ*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 prevocalically. 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-iyā* < **g^{wh}or-(i)yā* 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-iyā* < **g^{wh}od^{h}-(i)yā*. 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^{w}ar-yo-s* < **k^{w}r̥-yo-s*; *a* > *o* here after raising and so no further development to *u* by IV.2.1b), a derivation from **g^{w}ar-(i)yā* along with MW *gwared* 'mercy, love' is utterly straightforward. The correspondence between Hitt. 3sg. *kuen-zi*, 3pl. *kun-anzi* and Skt. 3sg. *hán-ti*, 3pl. *g^{h}n-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}n̥-més*, *-té*). Whereas MW *gwan-u* is easily explained in terms of generalized **g^{w}an-* < **g^{wh}n̥-* (McCone, 1986, 228), the traditional derivation of OIr. *gonaid* < **gon-* < **g^{wh}on-* entails a morphologically inexplicable *o*-grade. However, *gon-* < **g^{w}an-* by rounding resolves this problem at a stroke.

If OIr. *guide* 'prayer' is from **god-iyā* < **g^{wh}od^{h}-yā*, its vocalism could be squared with that of MW *gwedi* by assuming internal *i*-affection of **gwoðiṽ* < **g^{w}od-īmā*. However, the latter can be derived equally straightforwardly from **g^{w}ed-īmā* (< **g^{wh}ed^{h}-*) and the late survival of g^{w} with rounding in prehistoric Irish raises the distinct possibility of *guide* < **guð´eya* < **g^{w}iðiyā* < **g^{w}ed-(i)yā* < **g^{wh}ed^{h}-(i)yā* 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. *jaiδiiemi*, 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^{w}ið-i-þ* < **g^{w}ed-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 morphologically and semantically satisfactory interpretation of *uediiumi* on the first line of the Chamalières inscription as 'I pray (to), beseech' < **g^{w}ed-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^{w}onos* < 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}n̥-* or **g^{wh}r̥-* become PC **g^{w}ed-*, **g^{w}an-* or **g^{w}ar-* before PIE **g^{w}ihwo-* 'alive' (Skt. *jīva-s*, Lat. *vīvu-s*, Lith. *gýva-s*, OE. *cwic*), **g^{w}ow-* '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^{w}i-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 happen, *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-νιψ* 'hand water', gen. *χέρ-νιβ-ος*), MW *gi-eu* 'sinews' (sg. *giewyn*) < PC **gy-o/ā-* < **g^{w}y-o/ā-* (Skt. *jyā*, Gk. *βιός* 'bowstring') and MW *de* 'burning' < PC **deg-yā* < **d^{h}eg^{h}-yā* < **d^{h}eg^{wh}-yā* (Schrijver, 1995, 316-7). Notwithstanding 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^{w}* > *b* is provided by a combination of the labiovelars' liability to simplification with the virtual gap in an otherwise symmetrical 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	p	t	k	k^{w}	II	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^{h}uH-e-t(i)* (Skt. *b^{h}uvat*, Lat. *-bit*), OIr. *boí* < **bow-* < **b^{h}uh-* (Skt. *b^{h}ū-*, Gk. *φῡ-*, Lat. *fu-*); OIr. *rúad*, MW *rud*, Gaul. *Roud-* 'red' < **roud^{h}-* < **h$_{1}$rowd^{h}-* (Lith. *raūdas*, OE *rēad*; Skt. *rud^{h}-iras*, Gk. *ἐρυθ-ρός*, L *rub-er* < **h$_{1}$rud^{h}-*) like OIr. *cride* 'heart' < **krid-* < **k̂r̥d-* (Gk. *κραδ-ίη*, Lat. *cord-*), W *craidd* (if not a ghost as Schrijver, 1995, 319-21 suggests) < **k̂red-* in place of **k̂erd-* (Goth. *haírtō*); OIr. *brí* (g. *breg*), MW *bre* (OBrit. *Brig-antes*), Gaul. *-briga*, Celtib. *-bri(x)s* 'hill' < **brig-* < **b^{h}r̥g^{h}-* (Skt. *br̥h-*, OE *burg* 'fort') like OIr. *agid* 'drives', OW *agit*, *hegit*, MW *eyt* 'goes' < **ageti* < **h$_{2}$eĝ-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 adstratum influence from a pre-Indo-European language or languages may perhaps have played a role here.

III	p	t	k	k^{w}	IV	[-]	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^{w}ṃk^{w}etos* < **penk^{w}-* (Skt. *pañca*, Gk. πέντε etc.). If taken to be Celtic, the name *Hercynia* of a great northern European 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. *búachaill* 'herdsman' < **bow-kol-* < **g^{w}ow-k^{w}ol-* (Gk. βουκόλος) or OIr. *Olc(án)*, (Ogam gen. sg. ULCCAGNI), Lep. ULKOS 'Wolf', Gaul. *Catu-vulkos* 'Battle-wolf' < **(w)ulkos* < **wl̥k^{w}os* (McCone, 1985). If so, **perk^{w}unyā* (Lat. *quercus* 'oak', Goth. *fairguni* 'mountain', Lith. god *Perkúnas*) > **perkunyā* > **erkunyā*. This derivation, however, runs up against good evidence for non-dissimlation 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^{w}ut-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 **kwū*) 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*, **piblāseti* < **piprāseti*, **piplāseti* < **pi-pr̥h$_{2/3}$-se-ti*, **pi-pl̥h$_{2}$-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/v* (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 *φ* > Ø occurred everywhere else before the end of Proto-Celtic, it would be strange indeed if *φ* survivied 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* > **φatīr* but unchanged **sper-et-s* 'heel', which was consequently unaffected by *φ* > Ø 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* < **suwnos* < *suφnos* < **supnos* (Gk. ὕπνος; 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 *φ* > Ø, e.g. OIr. *fo* '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-m̥Ho-*; *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-* < **φat(e)r-* < **pat(e)r-* < **ph$_{2}$t(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* >) *φ* > Ø (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. ιμμι, *imi* 'I am' < **emmi* < **h$_{1}$es-mi* (Skt. *as-mi* etc.), OC *toim*, W *twym* 'warm' <

**tēmmo-* < **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* < **gannd-* < **g^{h}n̥-n-d-* (Gk. nas. pres. χανδ-άνει vs. aor. ἔ-χαδ-ε < **g^{h}n̥d-*) but OIr./MW *rann* 'share' < **rannā* < **rasnā* (< **rāsnā*?) < **pr̥h$_{2/3}$-sneh$_2$*. Nevertheless, this does not necessarily preclude a Proto-Celtic date for the assimilation. In view of the almost certainly Proto-Celtic raising and fonting of *e* to *ɪ* 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* > *æn/m* 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^{w}eteðres* (< **tesres*, **k^{w}etesres* 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-*, **-eγr-* 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' < **weγrah* < **weg-ro-s* vs. gen. sg. *féuir* < **weγ´r´ɣ* < **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 scaílte* 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 **tēsur-* and **k^{w}etesur-* or rather, in view of the failure of *es* > *is* in III.5.3 to apply, analogically lengthened **k^{w}etēsur-*. 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^{w}etēsūr-(es)* reflecting PIE **teysōr*, **k^{w}etesōr*. 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 **tr̥̄hīr* > **tr̥̄r* > 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 *ī* 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^{s}T was TT in Sanskrit, *s*T 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 *ðð* had this value: e.g., OIr. *nessam* 'nearest', MW *nessaf*, Gaul. *neððamon* < **ne(s)t^s-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 *ðð* represented this /ʦ/ and assimilation to *ss* first occurred in Insular Celtic (III. 5.3).

2.3 Both *þ* ([ʦ]?) and its voiced allophone *ð* ([ʣ]?) only occurred after *k̂,k,k^w* and *ĝ^h,g^h,g^{wh}* respectively in Proto-Indo-European and seem to have arisen by metathesis of *tk̂/k* ([t^{s}k̂/k]?) > *k̂/kþ* and *d^{h}ĝ/g^h* ([d^{hz}ĝ/g^h?] > *ĝ/g^{h}ð* (Schindler, 1977) after the separation of Anatolian and Tocharian. The reflex of *þ/ð* was *s* or the like in the other groups except Greek and Celtic, where they yielded the dental stops *t/t^h* and *t/d* respectively: e.g., OIr. *dú*, acc./gen./dat. *don* 'land, place' < **ĝ^{h}ðōm*, **ĝ^{h}ðom-* (Gk. *χθών*, Skt. *kṣām* 'earth'; unmetathesised Hitt. *tekan*, Toch. A *tkam* < **d^h(e)g^{h}ōm*); Gaul. -KTONI(O)N 'human', OIr. *duine*, MW *dyn* 'man' < **g^{h}ðom-yo-* (Gk. *χθόνιος* 'of the earth'); OIr. *art*, MW *arth* 'bear', Gaul. *Art-* < **arxto-* < **arkto-* < **h$_2$r̥k̂po-* (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, n̥, m̥* - Ṛ) when flanked by consonants (C): ER, RE, CṚC, ERṚ(C) and (C)ṚRE. However, the basic interconsonantal pattern for two sonants was CRṚC and in the case of CR the sonant was non-syllabic after a light syllable (CĔ-CRE; e.g., Skt. *mad^{h}yam* 'middle') but syllabic after a heavy syllable (CĒ-CṚE or CEC-CṚE; 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 **kom̥-wissuh* (OIr. *fi(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^{w}e/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' < **-RĪV̄ĐOR* < **-rīmeyetor* but pl. *ad:rímiter* (in place of *-etar*; *EIV* 86-7) < **RĪV̄E(y)odor* < **RĪV̄iyontor* < **-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' < **pl̥th$_2$no-* (Gk. *πλάτανος*; cf. Gk. *πλατύς*, Skt. *pṛt^{h}us* < **pl̥th$_2$u-*); OIr. *cride* 'heart' < **k̂r̥d-* (1.4); OIr. *ri(u)th* 'running' < **r̥t-u-*); OW *rit* (later *rhyd* 'ford') < **pr̥-tu-* (OHG *furt*, Lat. *portus*), Gaul. *Ritu-* < **r̥tu-* or **pr̥tu-*; OIr. *brí* 'hill', Celtib. -BRIS < **brix-s* < **b^{h}r̥ĝ^h-* (Celtib. **-birikea** < **-brige/ia*), MW *bre* 'hill', Gaul. *-briga* < **b^{h}r̥ĝ^h-ā*; OIr. *Brigit*, MW *bryeint* < **brigantī* (Skt. *br̥hatī*), Gaul. *Briganti-*, MW *breenhin* 'king' (cf. Celtib. **Birikantin**) < **brigantīnos* < **b^{h}r̥ĝ^h-n̥t-*. The latter is found in OIr. *arbar* 'grain' < **r̥-wr̥* (see below); OIr. *carr*, MW *car(r)*, Gallolat. *carrus* 'wagon', Gaul. *Carro-* < **karso-* < **kr̥so-* (Lat. *currus*); OIr. *arc-*, MW *arch-* 'ask' < **ar-ske/o-* < **pr̥(k̂)-sk̂e/o-* (Lat. *poscit*, Skt. *pr̥chati*); OIr. *a-t:baill* 'dies' < **balnit(i)* < **g^{w}l̥n(e)h$_1$-* (cf. Gk. *βάλλει*); W *sarn-* 'strew' < **sarnat(i)* <

**stṛnh₃-* (Skt. *stṛnāti*); OIr. *marb*, MW *marw* 'dead' < **mṛ-wo-* (cf. Lat. *mortuus*, 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 *ṇ* and *ṃ* 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, *ṇ*, *ṃ* > *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. *rígа*, Gaul. *-rigas* 'kings' < PC **rīg-ās* < **rīg-ans* < **rēĝ-ṇs*. Further straightforward correspondences are OIr. *ainm*, OW *anu* 'name', Gaul. *anuana* 'names' < PC **anm-* < **ṇm-* (4.4); OIr. *-gainethar*, MW *gan-* 'is born' < PC **gan-ye/o-* < **gṇ-ye/o-* < PIE **ĝṇh₁-ye/o-* (Skt. *jāyate*; 4.4); OIr. *ainb* 'ignorant' < **an-wiss* < **ṇ-wid-s*; OIr. *land*, OW *lann*, MW *llan* '(church) land' < **land-ā* < **lṇdʰ-* (ON *lundr* < **lṇdʰ-*, OE *land* < **londʰ-*), OIr. gen. pl. *ban*, Gaul. *bnanom* (with *bn-* from gen. sg., nom./acc. pl. *bnās*) < PC **ban-om* < PIE **gʷṇh₂-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-ṃ* vs. *ambi-* 'around', MW *am(-)* or *ym-*, OIr. *imm(-)* (Ellis Evans, 1967, 134-6) < **h₂ṃbʰi*; Gaul. *Brigind-oni* vs. *Brigant-* (Ellis Evans, 1967, 314-6) < **bʰṛgʰṇt-* in 3.2; Gaul. *and(e)-* 'in', MW *an-* or *en-*, OIr. *ind-* 'in' (Ellis Evans, 1967, 136-41) < **h₁ṇ-dʰi* (but OIr. *and* 'in it' < **h₁ṇ-dom*); Gaul. *Iovinc-illus*, OC *iouenc* vs. MW *ieuanc* < **yuwṇk-* (5.1); MW *ban*, Gaul. *banno-* or *benno-* (de Bernardo Stempel, 1987, 84), OIr. *benn* 'peak' < **bṇd-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 *ṇ*, *ṃ* > *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 *ṇ*, *ṃ* 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 **sī-lo-* < **sē-lo-* < **seh₁-lo-* (Lat. *sēmen* < **seh₁-mṇ*; OE *sāwan* < **sē-* < **seh₁-*); OIr. *dán*, MW *dawn* 'gift, ability etc.' < **dō-n-* < **doh₃-n-* < **deh₃-n-* (Lat. *dōnum*, Skt. *dānam*); OIr. *críth* 'purchase', W *prid* < **kʷrih₂-t-* (Skt. *krī-ta-*; Gk. πρία-το 'purchased'). Typical examples of colouring in non-lengthening contexts are OIr. *agid* etc. (1.4) < PIE **h₂aĝ-e-ti* < **h₂eĝ-e-ti* or OIr. *orgid* 'kills', Gaul. *Orge-* < **h₃org-e-ti* < **h₃erg-e-ti* (Hitt. *hark-* ?; same vocalism as OIr. *berid* < **bʰer-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-* < **h₂yu-h₃ṇ-ĥo-* (Skt. *yuvaśas*, Lat. *iuvencus*, OSax. *jung*; cf. Skt. *yuvan-/yūn-*, Lat. *iuvenis*, *iūnior* < **h₂yuh₃(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. *rúad* 'red' etc < **h₁rowdʰ-* (1.4); OIr. *nert*, MW *nerth*, Gaul. *Nerto-* 'strength' ('manliness') < **h₂ner-to-* (Lat. *Nero*, Umbr. *nerf* (acc. pl.), Gk. ἀνήρ, Arm. *ayr*, Skt. *nar-* 'man' < **h₂ner-* but *sūnaras* 'manly' < **h₁su-h₂ner-o-*); OIr. *ser* (Thurneysen, 1933, 199-200), MW *ser-en* 'star', Gaul. *Sir-ona* < **h₂ster-* (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. *anál*, MW *anadyl* 'breath' < **anatlā* < **h₂enh₁-tleh₂* (Skt. *aniti* 'breathes' < **h₂enh₁-ti*; Gk. ἄνεμος 'wind' < **h₂enh₁-mos*); OIr. *arathar*, MW *aradyr* 'plough' < **h₂erh₃-trom* (Lat. *aratrum*, Gk. ἄροτρον, Arm. *arawr*); OIr. *loathar* 'vessel', MB *louazr* < **lewh₃-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. < **patīr* < **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 **dʰugh₂-tēr* (Skt. *duhitar-*, Toch. B *tkācer*, Gk. *θυγάτηρ*, OE *dohtor*) on the Larzac inscription and the *a* < h_2 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 byeform **duktēr* without h_2 in Proto-Indo-European (cf. Armenian *dustr*; Godel, 1975, 76-7).

4.3 Positing $h_{2/3}\underset{\circ}{r}/\underset{\circ}{l}$- > *ar/l-* even before a stop in Proto-Celtic (Joseph, 1982, 50-1) provides the best morphological solution to OIr. *art* 'bear' etc. < **arkto-* < **h₂ṛ̊kʰo-* (2.3) and OIr. *argat*, OW *argant*, MW *aryant* 'silver', Gaul. ARKATO-, Celtib. **arkato-** < **arganto-* < **h₂ṛ̊ĝ-n̥t-o-* (Lat. *argentum*, Av. *ərəzata-*; Skt. *rajata-* < **h₂reĝ-n̥t-o-*). If so, this development would have to be placed before otherwise general $\underset{\circ}{r}$, $\underset{\circ}{l}$ > *ri, li* before a stop (3.2) and after the loss of h_1- on the evidence of OIr. *regaid* 'will go' < **rig-* < **ṛ̊g-* < **h₁ṛ̊gʰ-* (McCone, 1991b, 174-6). The chronological sequence would thus be (1) h_1 > Ø, (2) $h_{2/3}\underset{\circ}{r}/\underset{\circ}{l}$ > *ar/l* even before a stop, (3) $\underset{\circ}{r}$, $\underset{\circ}{l}$ > *ri, li* before a stop.

A change *ṛ̊h,l̥h,m̥h,n̥h* > *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. *pūrṇas*, Lith. *pìlnas*, OE *full*); OIr. *grán*, MW *grawn* 'grain' < **ĝṛ̊H-nom* (Lat. *grānum*, OE *corn*); OIr. *cnáim* 'bone', MW *knaw* < **kn̥h₂-mis* (Gk. *κνήμη*). A similar development before a stop would account straightforwardly for OIr. *gnáth*, MW *gnawd* '(known,) 'usual', Gaul. *-gnati* <**gnā-to-* < **ĝn̥h₃-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. < **ĝn̥h₁-teh₂* (Lat. *nata*); OIr. *mláith* 'soft', MW *blawt* 'meal' < **ml̥h₁-tis* (if **melh₁-* 'grind') or < **ml̥h₂-tis* (if cf. Gk. *μαλακός* 'soft'); OIr. *bráth*, MW *brawt* 'judgement' < **gʷṛ̊H-tus*; *rá(i)th* 'surety' < **pṛ̊h₂/₃-to/eh₂-*; Gaul. acc. RATIN, OIr. *rá(i)th* 'earthen rampart', if < **h₂ṛ̊h₃-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' < **wl̥H-tis* (Toch. B *walo* 'king' < **wl̥H-ont-s*, Lat. *val-ēre* 'be strong'), OIr. *mrath*, MW *brat* 'treachery' < **mṛ̊h₂-tom*, OIr. *rath* 'grace' or *-rath* 'was bestowed' < **pṛ̊h₂/₃-to-*, OIr. *srath*, W *ystrad* 'valley' < **stṛ̊h₃-to-*.

Since there is no obvious factor capable of generating both the R*ā* and the R*a* 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 R*ā* and ascribe R*a* 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 R*a* before stops (and perhaps *s*) but R*ā* 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-* < **bʰleh₃-tu-* (Lat. *flō-s*, Goth. *bloma*) and so on. Neither account is without its difficulties but the one entailing general ṚHC > R*ā*C and a single strategy of paradigmatically triggered remodelling to R*a* 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 > R*ā* above with the result that the 'non-laryngeal' development $\underset{\circ}{r}$, $\underset{\circ}{l}$, $\underset{\circ}{m}$, $\underset{\circ}{n}$ > *ar, al, am, an* took place in this environment: e.g., OIr. *-gainethar* 'is born', MW *gan-* < **ganyetor* < **gn̥yetor* < **ĝn̥h₁-ye-tor* (Skt. *jāyate*); OIr. *airid* 'ploughs', MW *ardd-* < **ar-ye/o-* < **h₂erh₃-ye/o-* (Goth. *arjan*, Lith. *arìu*, Lat. *arat*); OIr. *dairid* 'bulls' < **dar-ye-ti* < **dṛ̊-ye-ti* < **dʰṛ̊h₃-ye-ti* (Gk. *θρώσκει* 'jumps, mates' < **dʰṛ̊h₃-ske-ti*).

OIr. *arbar* 'grain' < **ar-war*, whether from **ṛ̊-wṛ̊* < **h₂ṛ̊h₃-wṛ̊* with generalised zero grade or from **ar-wṛ̊* < **h₂erh₃-wṛ̊* 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. *bráu*, OC *brou* 'quern' < PC **brāwū* would reflect **gʷreh₂-wō* with generalised full (cf. Skt. *grāvā*, *grāvan-*) and not **gʷṛ̊h-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 HR̥HC might be invoked to derive *r̥-wr̥ < *h_2r̥-wr̥ < *h_2r̥h_3-wr̥ and OIr. *ainm*, OW *anu* 'name', Gaul. *anuana* 'names' < PC **anm-* < **n̥m-* < **h_1n̥m-* < (zero grade) **h_1n̥h_3-m-* (Skt. *nāma*, Lat. *nomen* < **$h_1$neh$_3$-mn̥*). 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. **$h_1$néh$_3$-mn̥* and gen. sg. **h_1n̥h_3-mén-s* now favoured by many scholars over the currently less popular alternative **$h_{1/3}$nóm-n̥*, **$h_{1/3}$n̥m-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_1n̥h_3m-* in Old Irish would presumably have been **náim* or **anaim*. As far as OIr. *ard*, MW *ard*, Gaul. *ardu-enna* are concerned, only Skt. *ūrdʰvá-* points to **h_2r̥Hdʰwo-* and Av. *ərəδva-* rather indicates a preform **h_2r̥dʰwo-* 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* 'earthern rampart' from **rā-ti-* < **h_2r̥h_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 dramaticaly as a result of the loss of h_2, C*h*C > C*a*C and *n̥, m̥, r̥, l̥* > *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 **$h_2$yu-h$_3$n̥-ḱo-*; 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 *en*T > *in*T 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 **$h_2$weh$_1$-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/ < **bʰendʰ-* '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 **in* < **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 occasionally *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/ > [ǣ] before that shortening, there is no obstacle to the morphologically obvious

interpretation of Gaul. acc. sg. δεκαντεν/μ as [dekæntæn/m] < PC *ā*-stem **dekæntæm* < **dekantam* or **dekæntǣm* < **dekm̥tām*. 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 δεκαντεν/μ are rather to be analysed as /māterem/ and /dekanten/m/ [dekænten/m] with **-en/m* < **æn/m* < **-m̥* or **-ām*. If so, Cisalpine LOKAN (Todi) still reflects [-æn], as probably does the obscure Transalpine ματικαν. This approach entails a neat blanket development *n̥*, *m̥* > *an*, *am* in Proto-Celtic and renders unnecessary the uneconomical postulate (McCone, 1992, 27-8) of PC *m̥*, *n̥* > *-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 [ɪ], the latter then going on to merge with /i/).

A related raising of /ō/ to [o̝] 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,), has brought, 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 **o̝nk-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 *ō* > *ū* in final syllables, a further consequence of this process would be *o*-stem acc. sg. **-om* vs. gen. pl. **-o̝m* < **-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 **-o̝m* 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 C*e*R*a* to C*a*R*a* 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* < **k̂erH-t* (McCone, 1991b, 18) and the traditonal 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 R*ă* as opposed to R*ā* 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^{w}elh₁-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 R*ă* only.

On the other hand, he questions the restriction to non-final R*ă*(C) by suggesting OIr. *ben* < **benā* (adaptation of nom. sg. **bena* < **g^{w}enh₂* 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^{c}14 *-torchar* /torxər/ alongside Tur. 19 and Sg. 29^{a}8 *do:rochair* /do roxər´/. This surely clinches matters for this form's original non-palatal *-r*, the palatal bye-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 *e*R*ă* > *æ*R*ă* in Proto-Celtic, *æ*R*a*(-) then becoming *a*R*a*(-) whereas final *æ*R became *e*R in post-apocope Primitive Irish.

5.3 Notwithstanding the fact that the only PIE long vowels of any frequency were *ē* and *ō*, 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 *eh₁, ah₂, oh₃, ih, uh* > *ē, ā, ō, ī, ū* respectively before a consonant:

ī	**ū**
ē	**ō**
ā	

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 *ē* with *ī* along with the split of *ō* into *ā* in non-final and *ū* in final syllables. Typical examples of *ē* > *ī* are OIr. *rí*, *rígf(-)* 'king', W *rhi* (*Duorig Habren* 'id est duo reges Sabrinae' Nennius, *Historia Brittonum* §68 presumably for OW *dou rig* 'two kings'), Gaul. *-rix*, Celtib. **-reikis** /rīxs/ < PC **rīx-s*, **rīg-* < PIE **rēk̂-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 *ō* are seen in OIr. *már*, MW *mawr* 'great', Gaul.

-maros < PC **māros* < **mō-ro-s* < PIE **moh$_1$-ro-s* (Gk. *-μωρος*) vs. OIr. *cú*, MW *ki* 'hound' < PC **kū* for **kwū* (1.5b) < PIE **ḱwō* (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. **-eh$_2$-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. *tasmai* < 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 *ō* > *ū* 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 *anderon* (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 byeform **-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 **-o̧m* < **-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 *ū* for *ō* 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:

ī ū

ā

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 **-n̥s* > **-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' < **k$^{\text{w}}$ri-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* < **n̥mens* (4.4) further proves that Proto-Celtic -V*ns* > V̄*s* took

place later than the change *ē* > *ī*, since this patently failed to affect the new *ē* by compensatory lengthening.

This obviously raises the possibility that **-ons* > **-ōs* likewise occurred after *ō* > *ū* 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. *-ūs* (< PIE **-ōs*), acc. pl. *-ōs* (< **-ons*) was tending to be levelled there in favour of the latter on the model of nom.-acc. pl. *-ās* in the *ā*-stems. If so, the voc.-acc. pl. *-u* < **-ūs* of the Old Irish *o*-stems would have to be ascribed to a similarly triggered generalisation of originally nom.-voc. plur. **-ūs* before pronominal **-oi* (> **-ī*) 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-ī* < **bard-oi* would imply the following three stages before the end of the Insular Celtic period: (1) spread of **-ūs* from nom./voc. to acc. pl., (2) replacement of nom. pl. **-ūs* by **-oi* and (3) **-oi* > **-ī*. Since, however, an *i*-infected plural such as MW *beird* would aso be the regular outcome of a British nom. pl. **bardīh* < PC **bardūs*, 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 **-ūs* but could well be an *o*-stem abl. sg. *-ūz* < **-ūd* < **-ōd* (see I.3.5). Consequently the derivation of the Celtiberian *o*-stem gen. sg. **-o** from abl. **-ōd* 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)** < **-ō(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. **-ōs* 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) *ē* > *ī*, (2) -V*ns* > -V̄*s*, (3) *ō* > *ū* 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, *ē* (and possibly *ō*) will have been of very limited occurrence. An obvious way of filling out its range was to monophthongise the diphthong *ei* to *ē*. This had probably occurred before the end of Proto-Celtic, whereas a shift (*eu* >) *ou* > *ō* 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 *ē* < *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 τοουτιος, *-τοουτα* (*oov* /ou/ vs. *ov* /u/ or /ū/; 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 /ē/ and then probably /ī/) 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* > *ē* before consonants, which implies the following system of long vowels.

ī ū
ē
ā

Vowels were subject to 'Osthoff' shortening before certain consonant groups, especially those containing a liquid, after the Proto-Celtic changes *ō* > *ā* and *ē* > *ī*: 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* < **swādwā* < 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, h_3ew, ew*), *au* (< h_2ew for the most part), *oi* (< *oy*, h_3ey) and *ai* (< h_2ey 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-byn* (< **are pennī*) 'against' < **k^{w}ennū* < **-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^{w}n)-eh$_2$ey*; OIr. *náu* 'ship' < **naw-ā* replacing **naw-s* < **nāws* < **neh$_2$-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) -V*ns* > -V̄*s* (5.4)
(c) raising/fronting of *e*, *ā/a*, *ō/ɔ* > *ɪ*, *ǣ/æ*, *o̧/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 *o̧* > *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)

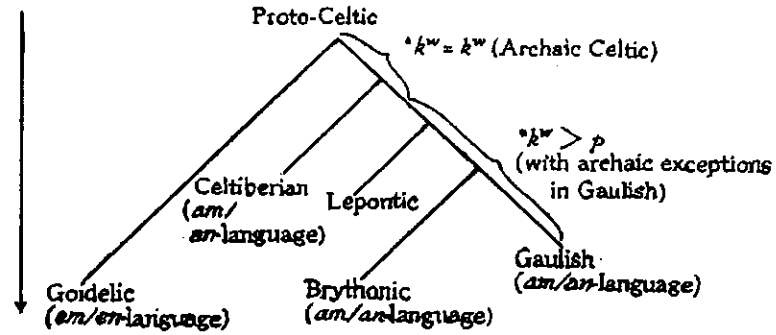
In the likely event that OIr. *léic-* 'leaves' is the regular reflex of **link^{w}-e/o-*, OIr. *-ic* 'comes (to)' must ultimately be from **ĩnk* < **h$_1$ēnk̂-* or the like (McCone, 1991b, 47-52). These distinct reflexes are easy enough to generate

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}-* > **lɪnk^{w}-* > **lēg^{w}-* but **ĩnk-* > **ink-* > **ig-* (IV.1.3-4).

CHAPTER THREE

The Voiceless Labiovelar, Syllabic Nasals, Lenition and the Celtic Family Tree

1.1. THE VOICELESS LABIOVELAR. Schmidt has repeatedly (e.g. 1977, 1980, 1986 and 1988 and 1988b) argued for the following basic scheme of incipient differentiation between the main attested sub-Celtic groupings (here given according to 1988, 8).



1.2 The first of the two criteria employed is, of course, the famous change $k^w > p$ characteristic of both British and Gaulish (as well as 'Lepontic'), e.g. Gaul. *penno-*, MW *penn* vs. OIr. *cenn* 'head' < **k^{w}enno-* or Lep. *-pe* vs. Celtib. **-kue**, OIr. *-ch* 'and' < **k^{w}e* (Lat. *-que* etc.). Viewed as a shared innovation, this has been taken by Schmidt and others as a powerful criterion for recognising a Gallo-British sub-family from which k^w-retentive Celtiberian and (Ogam) Irish are then automatically excluded.

The diagnostic value of this feature is, however, undermined by a number of considerations. Firstly, compromise simplification of the labiovelar's double articulation [velar stop + labial continuant] to produce a plain labial stop is too well motivated phonetically for its separate occurrence in British and Gaulish to be ruled out. Not only is Proto-Celtic $g^w > b$ an obvious instance of this phenomenon but, as Schmidt himself concedes (1988, 5), within Indo-European it is independently attested in Osco-Umbrian and (with some contextual restrictions) Greek, not to mention Rumanian within the Romance family descended from *qu*-retentive Latin. Indeed, as a result of the gap in the system left by loss of *p* in late Proto-Celtic (unlike either Osco-Umbrian or Greek)

systematic pressures favouring $k^w > p$ would have been similar to those previously responsible for Proto-Celtic $g^w > b$. Given this powerful motivation, it is quite easy to envisage $k^w > p$ occurring independently in at least two branches of Celtic.

That said, a further possibility also presents itself. Although commonly dubbed Celtic, the 'La Tène' migrations into North Italy and along the Danube as far as Asia Minor from the sixth to the third centuries B.C. are more correctly considered Gaulish on the evidence both of classical authors and of such linguistic material as survives. There is no difficulty in assuming that Celtic migrations westwards and northwards to Spain, France, Belgium and Britain had preceded this phase, which entailed the spread of a Gaulish variety of Celtic certainly characterised by *p* for k^w from a centre north of the Alps. Positing a secondary 'Gallicisation' of France and Belgium at about this time would explain the arguable survival of k^w-Celtic pockets there in the historic period (Schmidt, 1977, 17). As for Celtic Britain, cross-channel contacts would suffice to account for the spread of the structurally motivated *p*-isogloss thither from Northern Gaul (Mac Eoin, 1986, 167-71). Since, however, Caesar's *De Bello Gallico* V 12 provides good evidence for quite recent Belgic incursions into and settlement of the south coast of Britain, it is also conceivable that these were responsible in the second or third century B.C. both for the introduction of *p* for k^w into Southern Britain and for a more or less simultaneous 'knock on' migration from a still k^w-retentive area further north to Ireland. Subsequently the *p*-isogloss will have spread throughout British Celtic, being prevented from going further by the Irish Sea rather as the barrier of the Pyrenees seems to have impeded its penetration from Gaulish into Celtiberian.

Whatever the precise details of its emergence, $k^w > p$ is not at all reliable as a criterion for the genetic classification of Celtic languages, and its occurrence in both Gaulish and British falls well short of necessarily implying a Gallo-British subfamily from which Irish must then have already separated at some earlier stage.

1.3 Furthermore, little weight attaches to any of the four features adduced by Lejeune in support of the since generally accepted view that the so-called 'Lepontic' of inscriptions from around the Lago Maggiore represents a separate 'para-Gaulish' branch of Celtic and as such is to be distinguished from the Cisalpine Gaulish proper of the Todi, Briona and Vercelli inscriptions. The claim (*Lej.* 460-6) that the Lepontic reflex of *n̥* was *en* not *an* is based upon the extremely doubtful (Schmidt, 1977, 18) interpretation of a single word SITES of the Prestino inscription as acc. pl. with *-ēs* < **-n̥s*. As for the examples PIUONEI and ASILONEI (*Lej.* 437-8) of a Lep. *n*-stem dat. sg. *-ei* (old dat.) vs. Trans. Gaul. *i*-stem *-ē* (< loc. **-ei*) and cons. stem *-i* (old loc.), these need be no more than sandhi variants in origin since *ei* > *ē* occurred only before consonants (cf. I.3.6). As regards the morphological contrast between originally

dative and locative forms, the survival of a separate locative form in Celtiberian makes it quite possible on present evidence that dative-locative syncretism first occurred within Gaulish, the Cisalpine and Transalpine branches tending to generalise old datives and locatives respectively in the consonant stems.

The significance of Lep. *-m* vs. Cis. Gaul. *-n* (*Lej.* 432-5) has been completely undermined by the evidence of the Larzac inscription for fluctuation between *-m* and *-n* still at quite a late date in Transalpine Gaulish, and the suspiciously close proximity of Vercelli to the 'Lepontic' area is anyway sufficient to call the dichotomy into question. Since, moreover, the inscriptions around the Lakes are almost certainly earlier for the most part than the other three, the by any standards trivial *-n* for *-m* could be simply a matter of chronology as, for that matter, could the survival of an old *-ei* dative in the *n*-stems.

That leaves Lep. TETU /dedū/ 'set up' < **dedō* < **dʰedʰoh₁e* vs. Trans. Gaul. δεδε with *-e* taken over from the majority of perfects without final laryngeal (*Lej.* 446-52). Given original 3sg. *-ū* in some versus *-e* in most old perfects, the new 'weak' *-it-* preterite was free to adopt either or both. Consequently it would be rash to read too much into ('Lepontic') Vergiate KARITE, KALITE but (Cis. Gaul.) Todi KARNITU agreeing with Transalpine Gaulish *καρνιτου*. In addition to *p* < k^w, 'Lepontic' shares with Cisalpine Gaulish an assimilation of *nd* > *nn* not even found in Transalpine Gaulish and has an *-it-* preterite as well as an *-ikno-* patronymic otherwise definitely attested only in Gaulish among known Celtic languages.

Of late the *o*-stem gen. sg. has become an issue, as can be seen from a recent discussion by Eska (1995), who elsewhere makes the following comment: 'It is especially noteworthy now that Celtic can be included among those Indo-European daughter languages which continue **-osyo*. Lepontic (a peripheral and archaic dialect of Gaulish by my reckoning), like Venetic, attests several examples of *-oiso*. Most analysts have treated this as a metathesized variant, but I prefer to treat it as the product of a crossing with Indo-European pronominal gen. pl. **-oysōm*' (Eska, 1995b, 14; cf. Celtib. **soisum**, II.5.3). The fact that 'Lepontic' still retains *-oiso* alongside subsequently generalised *-ī* is no more detrimental to its essential status as early Gaulish than a similar dichotomy between older *-osio* and subsequently dominant *-ī* in both Latin (in the wake of the Satricum inscription; de Simone, 1980b) and Faliscan (Devine, 1970, 23-5).

1.4 As pointed out by Cowgill (1980, 67-8), the Gaulish and British change $k^w > p$ produced a stop system in which g^w (< g^{wh}) was now isolated as in stage V below, the result being structural pressure towards symmetry by emptying its slot. If, as seems probable, *uediiumi* on the Chamalières inscription means 'I pray' and so continues **g^{w}ed-yū(+mi)* < **g^{wh}edʰ-yō* (McCone, 1991b, 102-3 and 119-20), we may provisionally conclude that Gaulish had reached

stage VI by simplifying $g^w > w$. As argued in II.1.2, British may well have behaved similarly, although the initial reflexes there are compatible with either retained g^w- or w- < g^w- and the internal ones may be easier to square with -g^w- > -b- than -g^w- > -w-. Even if $g^w > w$ was general in both, the structural pressures after stage V were such that independent developments seem quite possible.

V	p	t	k	[-]		VI	p	t	k
	b	d	g	g^w			b	d	g

As mentioned earlier, the imbalance of the three voiceless versus four voiced articulations in the late Proto-Celtic stage IV (II.1.5) was redressed quite late in the prehistory of Irish. The first stage was apparently the limited acquisition of *p* in some pre-affection early Latin loanwords like *cepp* 'log' < *cippus*, *prid†chid* 'preaches' < *pr(a)edicat* (McManus, 1983, 36-8) to produce 4/4 (as in stage III in II.1.5) and the second a reduction to 3/3 by post-lowering simplification of k^w, g^w (McManus, 1983, 47-8) resulting in their merger with *k*, *g* (IV.3.4). Meanwhile *p* became more and more frequent through the continuing introduction of Latin loanwords like *póc* 'kiss' < *(osculum) pacis* (VI.2.4-7) and through post-syncope provection of -$b^{\dagger}h$- > -*p*- in some native words, e.g. -*impai* 'turns' < *-*imb†hoy* < *-*imbi-how´* < *-*æmbi-sowet* (V.1.6). In this way something like the system in VI above was arrived at by a different route, but by then Irish lenition and palatalisation had quadrupled the number of phonemes at each of the six points (e.g. *t*, *t´*, *θ*, *θ´* for original *t*; I.6.1).

2.1. SYLLABIC NASALS. The treatment of the Proto-Indo-European syllabic liquids and nasals in Proto-Celtic has been described in the previous chapter (II.3.2-3 and 4.3-4). However, it seems appropriate to discuss the basic reflexes of η and μ in greater detail here because of the major role accorded to them by Schmidt (see 1.1 above) in his theory of the earliest subdivisions of Celtic.

It is generally agreed, albeit simplistically in view of quite a few deviant reflexes like the Gaulish month-name *Elembiu* (< *$el\eta b^h$-*, cf. Gk. ἔλαφος 'deer' and Ἐλαφηβολιών) etc. (II.3.3), that the syllabic nasals basically became *an* and *am* in all of the non-Goedelic Celtic languages. In addition to the **brigant-* forms in II.3.2, typical examples are Gaul. *ande-* (Cisalpine *ane-*, *ano-*), MW *an(n)-* 'in' < *$h_1 n d^h i$* (Skt. *ad†i*); Gaul. *an-*, MW *an-* 'un-' < *η-*; Gaul. *dekant-* 'tithe' < *$dek\mu t$-*; Celtib. **kantom**, MW *cant* 'hundred' < *$\acute{k}\mu tom$*; OB *ankou*, C *ancow*, MW *angheu* 'death' < pl. *$\eta\acute{k}$-ow-es* (Lat. *nex*, *nec-is*, Gk. νέκυς 'corpse', Skt. *naśati* 'perishes' < *$ne\acute{k}$-*).

As indicated in II.3.3, most of the reflexes in Irish have traditionally been taken to point to a development η, μ > *en*, *em* (*VKG* I 45-7 and *GOI* 129-30), the corollary being that the precursor of Irish split off from the rest of Celtic before η, μ became *an*, *am* there. Thus Schmidt's scheme above envisages Goedelic branching off when η and μ were still unaltered in Proto-Celtic, in most environments at least, and places the general development of *an*, *am* at a subsequent stage shared by the rest of the family. The next branch to separate out was Celtiberian prior to the change $k^w > p$ shared by Gaulish (including 'Lepontic') and British. Finally, Gallo-British split into Gaulish and British. Obviously this scenario completely precludes the possibility of Insular Celtic as a genetic phase shared by British and Irish after Proto-Celtic had begun to break up. The inadequacy of $k^w > p$ as evidence for Gallo-British and against Insular Celtic having already been pointed out, the obvious next step is closer scrutiny of the reflexes of η, μ in this context.

2.2 To begin with, as a cursory glance at *GOI* 129-30 shows, it is a gross oversimplification of the facts to contrast η, μ > *en*, *em* in Goedelic with η, μ > *an*, *am* in the rest of Celtic. This point was duly made by Oswald Szemerényi in a review of Schmidt's (1977) earliest presentation of his model: 'Our author puts great emphasis on the syllabic nasals developing a vocalic element *a* and *e* respectively (23). And yet he knows that these differing results do not represent absolute values. We find in Gaulish not only *am/an* but also *em/en*, and Goedelic has of course also *am/an*, cp. the consonantal acc. pl. *-ās* from *-ans*, IE *-ηs*. And if Cowgill is right in postulating *am/an* for Goedelic also, which developed to *em/en* before obstruents only (except for final **-ηs*), then it seems to follow that *am/an* was the general Celtic development which was further, that is later, changed to *em/en* in all branches under certain, at present ill-defined, circumstances' (*ZCP* 36, 1977, 296).

In the wake of Szemerényi's comments Schmidt conceded 'that before *s* the pan-Celtic reflex of the nasal sonants appears to have been *an*, as Goedelic also makes clear' (1986, 166). De Bernardo Stempel (1987, 22-40 and 50-53) then took the obvious further step of acknowledging Proto-Celtic *an*, *am* < η, μ in other positions where the Old Irish reflexes were *an*, *am* rather than actual or inferred *en*, *em* but denied the possibility of Goedelic *an/am* reflexes before a stop. Her conclusions formed the basis for Schmidt's revised position that 'η before *s* had already developed to *an* in the Proto-Celtic period (cf. De Bernardo Stempel l.c. 165)' and 'the passage from **ηs* to **ans* is subsumed under the Proto-Celtic sound law of the conditioned transformation of the nasal and liquid sonants to *am*, *an*, *al*, *ar* before *s*, laryngeal + vowel and sonants (apart from *m*)' (1988, 8). In other words, before the relatively early loss of post-syllabic laryngeals in Proto-Celtic (II.4.1-4) η and μ became *an* and *am* when followed by HV, *s*, *r*, *l*, *n*, *y* (including < Hy) and *w* but remained unchanged elsewhere right down to the branching off of Goedelic. After this

appreciable interval the change to *an* and *am* was replicated here too in the central stock, whereas the same environments yielded *en* and *em* in Goedelic.

This hypothesis is both uneconomical and intrinsically implausible, as de Bernardo Stempel is forced to admit: 'The vocalisation of the nasals before stops and in final position > Ir. *en*, *em* vs. Brit., Cont. *an*, *am* was the only one... to take place in the period after Proto-Celtic. There is hardly any parallel for this in Indogermania' (1987, 51). Elsewhere vocalisation served as a straightforward strategy for total eradication of the syllabic allophones *r̥*, *l̥*, *n̥* or *m̥*, and there is no obvious parallel for the two widely separated tiers posited here for the disappearance of *n̥* and *m̥* in Celtic. However unusual, the environmentally conditioned split in the vocalisation of *r̥*, *l̥* to *ar*, *al* or *ri*, *li* offers no support, since the upshot was the complete and presumably more or less simultaneous loss of syllabic *r̥*, *l̥* in Proto-Celtic. In short, it is hard to see why, unlike *r̥* and *l̥*, *n̥* and *m̥* should have been resolved into vowel plus *n* and *m* before certain sounds at an early stage while continuing to be tolerated as syllabics for a disturbingly long time before others.

2.3 These are not the only difficulties and contradictions to beset Schmidt's and de Bernardo Stempel's construct, which places considerable emphasis upon an alleged parallelism between *n̥*, *m̥* > *am*, *an* and *r̥*, *l̥* > *ar*, *al* before (H)V, s, *r*, *l*, *n*, *y* or *w* in Proto-Celtic. This is hardly a compelling *a priori* assumption in view of their divergent behaviour in remaining contexts, where the latter typically became *ri*, *li* but the former certainly did not yield *ni*, *mi* as a rule. Consistent application of this principle in any case implies Proto-Celtic *-n̥*, *-m̥* > *-an*, *-am* parallel to *-r̥* (and presumably *-l̥*) > *-ar* (*-al*). However, this development cannot be conceded because de Bernardo Stempel's (1987, 34) case depends upon rejection of a change *am*, *an* > *em*, *en* in Goedelic that would be fatally undermined by the need for numerous derivations like OIr. *deich* 'ten' < **dek-em* < **dek-am* < **dek̂-m̥* or acc. sg. *athair* 'father' < **ater-em* < **ater-am* < **ph₂ter-m̥* and so on for all other m./f. consonant stems in Old Irish. If there was no parallelism here, it is hard to see why it should be insisted upon elsewhere, especially when a divergent treatment of *r̥* and *n̥* before *m* is proved by OIr. *cruim*, MW *pryf* 'worm' < **kʷr̥m-is* (Skt. *kr̥mis*, Lith. *kirmìs*) vs. OIr. gen. sg. *anmae* 'of a name' < **an-mēs* < **n̥m-en-s*. Whether the PIE preform of the latter is reconstructed with one or two laryngeals (see II.4.4), **n̥m-* unquestionably resulted in Proto-Celtic and, in the absence of any other good evidence for a different treatment of this sequence, de Bernardo Stempel's rather desperate objection that 'this reconstruction would presuppose the passage of **n̥* > *an* before *m* just as before the other sonants, which is suspicious on account of **r̥*, *l̥* > *ri*, *li* before *m*' (1987, 70) is a patently circular argument.

It will be argued below that the OIr. reflex of Proto-Celtic *n̥n* was *enn* rather than *ann*, that the rule about *ns* must be refined to take account of non-final *ēs* < *ens* < *ans* in Old Irish and that some indubitable cases of *an*, *am* < *n̥*, *m̥* before a voiced stop in Old Irish conclusively disprove the theory devised by de Bernardo Stempel and Schmidt.

2.4 Before proceeding with the search for an alternative capable of covering the facts satisfactorily, it may be helpful to tabulate the relatively complex Old Irish reflexes of PIE *n̥*, *m̥* under six main headings geared to Proto-Celtic environments.

(a) **-n̥s* > **-ans* > **-ās* > *-a* in cons. stem m./f. acc. pl.: e.g., *ríga* 'kings' < **rīgās* (Gaul. *Bitu-rigas* etc. in Caesar) < **rīgans* < **rēĝn̥s*.

(b) *n̥*, *m̥* > *an*, *am* before (H)V, *y*, *w*, *m* (, *r*, *l*?): e.g., gen. pl. *ban* 'of women' < **ban-om* < **gʷn̥h₂-om*; *-gainethar* 'is born' < **gan-ye-tor* < **gn̥-ye-tor* < **ĝn̥h₁-ye-tor* (Skt. *jāyate*); *ainb* 'ignorant' < **an-wiss* < **n̥-wid-s*.

(c) *n̥*, *m̥* > *an*, *am* sometimes before a voiced labial or dental stop: e.g., *land* 'open space', *ith-land* 'threshing floor' (OW *it-lann*, MW *llan*, *yd-lan*, C *lan*, B *lann* 'heath') < **landā* < **ln̥dʰ-* (Goth. *land* etc. < **londʰom*, ON *lundr* < **ln̥dʰos*; Goto, 1985); *and* 'therein' < **andom* < **h₁n̥dom* (Hitt. *andan*, Gk. ἔνδον).

(d) *n̥* > *en* before another *n*: e.g., OIr. *benn* 'peak', MW *bann*, MB *ban*, Gaul. *banno-* < PC **banno-* < **bandno-* < **bn̥d-no-*; MidIr. *ro:geinn* 'finds a place', W 1sg. *gannaf* < PC **ganne/o-* < **gannd-et(i)* < **gʰn̥nd-* (Gk. χανδάνει, Lat. *prae-hendit*). It is to be noted that a sequence of two nasals plus a voiced stop would seem to have been simplified by loss of the stop as early as Proto-Celtic.

(e) *n̥*, *m̥* > *in*, *im* before a voiced stop as a rule: e.g., OIr. *imm*, MW *am*, Gaul. *ambi-*, Celtib. **ambi-** < **h₂n̥bʰi* (Gk. ἀμφί, Lat. *amb-*, Umbr. *amb-*, Osc. *am-*, Skt. *abʰi*, OHG *umbi*, OE *ymb(e)*); OIr. *imb* 'butter', gen. sg. *imbe* (B *amann*) < **h₃n̥gʷ-* (Lat. *unguen* 'ointment', cf. Skt. *añj-as-* < **h₃engʷ-*); *ind-* 'in(to)' (Gaul. *ande-*, MW *an(n)*) < **h₁n̥dʰi* (OInd. *adʰi*); OIr. *ingen* 'nail', OW *eguin* (later *ewin*) < **h₃n̥gʷʰ-* (Lat. *unguis*; ON *nagl*, Gk. ὄνυχ-, Lith. *nãgas* < **h₃nogʷʰ-*); OIr. *ingnad* 'unusual' < **n̥-ĝn̥h₃-to-*; OIr. *tengae* 'tongue' < **tɪngwāt-* (MW *tauawt*) < **d/tn̥gʰwā* (Goth. *tuggo*, OLat. *dingua*, Lat. *lingua* etc.); OIr. *ing* 'strait', MW *eh-ang* 'wide' < *(*exs-)n̥gu-* with generalised zero grade (as in PIE gen sg. **h₂n̥ĝʰ-éw-s*, or perhaps < full-grade **angu-* as in PIE nom. sg. **h₂énĝʰ-u-s*; cf. unambiguously or arguably full-grade cognates like OInd. *aṃhu-*, Goth. *aggwus*, ON. *ǫngr* or Gk. ἄγχ-(ι), Lat.

angi-; Celtib. **ankios**, **esankios**?).

(f) *ŋ̥*, *ɱ̥* > *é* before a voiceless stop or fricative (see below on *s*); e.g., *écht* 'slaughter' < **ænx-tu-* < **ŋ̥ḱ-tu-*; *éc* 'death' < **ænk-u-* (OB *ankou* etc.; Celtib. **ankios**, **esankios**?) < **ŋ̥ḱ-u-*; *dét* 'tooth' < **dænt* (MW *dant*) < **h₁dn̥t-* (Lat. *dent-*, Goth. *tunþ-*, Skt. *dant-/dat-*; Gk. ὀδοντ < **h₁dont-*); OIr. *é-tromm* 'light' < **æn-trumbos* < **ŋ̥-*; *cét* 'hundred' < **kæntom* (MW *cant*, Celtib. **kantom**) < **ḱm̥tom* (OInd. *śatam*, Gk. *è-κατόν*, Lat. *centum*, Lith. *simtas*, Goth./OE *hund*). It is to be noted that the nasal voiced a stop (but not a fricative) before its disappearance, a fact obscured by Old Irish orthographic conventions but obvious from Modern Irish *éag* 'death', *déad* 'tooth', *éadrom* 'light', *céad* 'hundred' and so on.

Since the Old Irish reflexes in (a)-(c) agree with those in British and, by implication at least, Continental Celtic, Proto-Celtic *ŋ̥*, *ɱ̥* > *an*, *am* is strongly indicated in the relevant contexts. On the other hand, the Goedelic *en*, *em* or the like apparently responsible for the Old Irish outcome in (d)-(f) differs from the *an*, *am* securely attested in British and Continental Celtic. Since a model like Schmidt's and de Bernardo Stempel's seems bound to ascribe occasional Gaulish deviations from this such as *Elembiu*, *Brigindoni* or *Iouincillus* to secondary fronting of *am*, *an* to something like *em*, *en* or *im*, *in* locally at least in Gaulish, there is absolutely no *a priori* reason why a similar fronting should not be posited for Goedelic in environments (d)-(f). If it is, *ŋ̥*, *ɱ̥* > *an*, *am* becomes a perfectly straightforward general Proto-Celtic change and is no longer prey to the array of serious problems documented above. So great are the advantages of this postulate that it can be effectively countered by nothing less than insuperable objections to tracing Goedelic *en*, *em* back to PIE *ŋ̥*, *ɱ̥* via Proto-Celtic *an*, *am*. It would, of course, be rendered quite irresistible by evidence that PIE or pre-Celtic *an*, *am* became *en*, *em* or the like in Goedelic in environments (d)-(f), since the same change would be bound to have affected Proto-Celtic *an*, *am* < PIE *ŋ̥*, *ɱ̥* too.

2.5 Hamp's claim that 'before voiceless stops original syllabic nasals are indistinguishable from **a* plus nasal' (1965, 225, n.2) is disputed by de Bernardo Stempel (1987, 35) on the grounds 'that the Irish merger of *an* + *tenuis/s* and *en* + *tenuis/s* as *é* + *media/s* is relatively late... and only affected the position under the accent as well as the unaccented position in internal post-apocope syllables'. Thus (i) **gansis* > **gensis* > OIr. *géis* 'swan' (stressed *an*), (ii) acc. pl. **karant-ŋ̥s* > **karant-ans* > **karant-ās* > **karant-a* > **karenta* > OIr. *cairtea* 'friends' (internal unstressed *an*) but (iii) acc. sg. **karant-ɱ̥* > **karant-em* > **karant´* > OIr. *carait* 'friend' (1987, 94: note the erroneous assumption that /nt/ had not yet become /d/ by the time of the general apocope; IV.1.3). Since she herself is obliged to posit *an* > *en* before a voiceless stop or *s* in all but post-apocope unstressed final syllables, it is hard to see the point of de Bernardo Stempel's further objection 'that there is no regular sound change *a* > *e* otherwise in Irish either' (1987, 34). Nor does it matter whether Goedelic *an* > *en* in (i) and (ii) was 'relatively late' or not, since *an* < *ŋ̥* by Proto-Celtic would be affected either way.

The only possible reason for denying *an* > *en* in (iii) is the non-palatalisation of the *r* of *carait* versus the palatalisation seen in *cairtea* and so on. However, this provides no explanation for numerous comparable cases not involving a nasal such as OIr. 3sg. *-tabair* 'gives' < **-taver´* < **-to-beret* vs. 3pl. *-taibret* < **-tav´ĭrod* < **-to-beront*. These can only be satisfactorily accounted for by the rule (IV.3.1-2) that consonants between a back vowel (*a/o*) and *e* were not palatalised in Primitive Irish unless the *e* had been weakened to a palatal schwa (here designated *ĭ*) prior to syncope. That being so, a form like *carait* would be the regular outcome of **karent-en* < **karant-ɱ̥* in accordance with Hamp's view. Indeed, the hypothesis that *an* became *en* before a voiceless stop or *s* in all positions in Primitive Irish is indispensable in the light of forms like nom. sg. *car(a)e* 'friend' < **karēs* < **karen-s* < **karan-s* < Proto-Celtic **karant-s*. Since her rule predicts OIr. **cara* here, de Bernardo Stempel is forced to declare that the actually attested 'nom. sg. *car(a)e* is presumably a new formation' (1987, 94) without supplying any model or motive for the alleged analogy. As nom. sg. *teng(a)e* 'tongue' is almost certainly an analogical replacement of **tenga* < **tingʷāt-s* and *nt*-stems like *car(a)e* are the obvious model, their *-(a)e* can hardly be analogical as well.

If, then, examples like OIr. *géis* 'swan', *car(a)e* 'friend' < **gans-*, **karant-s* respectively prove the fronting of old *a* to something like *e* before nasal plus voiceless stop or fricative in Goedelic, it follows ineluctably that any *an* or *am* already brought into being by a Proto-Celtic change of *ŋ̥*, *ɱ̥* > *an*, *am* would have been affected by the same process. Since de Bernardo Stempel's (1987, 34) *-cét* 'was sung' < **kn̥tó-* is highly questionable on the grounds that an *a*-root of this type was not liable to ablaut as a rule, OIr. *-cét* 'was sung' or *cétal* 'song' < **kant(l)o-* (OIr. *canaid*, Lat. *canit*, *cantum* 'sing(s)') makes it quite illogical to insist upon OIr. *cét* 'hundred' < **kentom* < PC **kn̥tom* (MW *cant*, Lat. *centum* etc.) rather than < PC **kantom* < PIE **ḱm̥tom*. Clearly, then, *an*, *am* > *en*, *em* or the like must be recognised as a general Primitive Irish development before a voiceless stop, *x* or *s*, although it may be that before a stop (as opposed to *x* and *s*) loss of the nasal was accompanied by compensatory lengthening of *e* to *é* in stressed syllables only. That being so, the Old Irish reflexes in (f) above are perfectly compatible with Proto-Celtic *ŋ̥*, *ɱ̥* > *an*, *am*. This in turn creates a presumption that OIr. *enn* in (d) arose from *ann* in a similar manner, even in the absence of a definite example involving

old *a* in this small group. That leaves the reflexes before voiced stops in (c) and (e) above.

2.6 Here attention must obviously focus firstly upon the question of whether at least one or two of the frontings in (e) likewise reflect an indisputable older *a* and secondly upon the dual treatment of *n̥*, *m̥* in this environment evinced by the contrast between (e) with *in/m* and (c) with an *an/m* completely at odds with the theses of Schmidt and de Bernardo Stempel, who does not even mention, let alone discuss, the particularly awkward OIr. *land* '(open) space' < **lnd̥ā* adverted to by Hamp (1965, 225, n.2). OIr. *camb* 'crooked' (MW, C *cam*, B *kamm*), *cim(b)* 'tribute, silver' (B *kemm*) and *cimbid* 'captive, prisoner' can all be derived from a single Celtic root **kamb-* or **k(e)mb-* basically meaning 'turn, twist, (ex)change' or the like and also seen in Gaulish *cambion* 'crooked' plus Gallo-Latin *cambiare* 'exchange', as plausibly suggested by de Bernardo Stempel (1987, 96-7). However, she is then confronted by an insoluble problem owing to her rejection of *am, an* > *im, in* before a voiced stop and insistence upon *n̥, m̥* directly > Goedelic *en, em* in this environment. As a result OIr. *cimb(id)* must be derived from **km̥bi-(yati-)* and *camb* from the **(s)kambo-* also seen in Gk. σκαμβός 'crooked'. If so, these can hardly be from the same root since the zero grade **km̥b-* implies a full grade **ke/omb-* not **kamb-*, while the latter's invariable *a* almost certainly rules out the possibility of a zero grade **km̥b-*. Accordingly the semantically attractive derivation from a single root can only be upheld either by deriving *camb* etc. from **km̥bo/ā-* and *cimb(id)* etc. from **km̥bi-* or **kembi-* or by positing the preforms **kambo/ā-* and **kambi-* respectively. The former entails OIr. *am, an* < *n̥, m̥* before voiced stops under certain circumstances while the more probable alternative, given Gk. σκαμβός, demands Primitive Irish fronting of old *an, am* to *in, im* before a voiced stop in conditions that have yet to be determined.

Since the theories of Schmidt and de Bernardo Stempel can cope with neither of these two possibilities nor with OIr. *land* (2.4c), they must be abandoned in favour of the only hypothesis with any potential in this regard, namely that of a general Proto-Celtic *n̥, m̥* > *am, an* already found to be fully compatible with the OIr. reflexes in 2.4(a), (b), (d) and (f).

The first of two positive pieces of evidence for Primitive Irish *an, am* > *in, im* drawn to my attention by Damian McManus is provided by an inscribed stone from the Isle of Man. This contains an inflectionally latinised British AMMECATI in the Roman alphabet on one face and Ogam Irish [AM]B[I]CATOS with native inflection on the rim, both in the gen. sg. as is usual in this material. The British equivalent plus corresponding OIr. *Imchad* < **Imbi-xaθuh* (< **-katus*; gen. *Imchado* < **Imbi-xaθōh*) leave no doubt about the restoration of missing [M] and [I]. Since, however, there is no room at the beginning for the five notches representing I in the Ogam alphabet, it seems necessary to

restore the single notch standing for A there. The traditional doctrine that Proto-Celtic *m̥* yielded *am* in British but *em* in Irish leads to the utterly *ad hoc* speculation that the Irish name in Ogam retained its proper /mb/ in the face of British /mm/ by assimilation but then unaccountably replaced its inherited initial /i/ with an /a/ taken from the British equivalent (*LHEB* 173, n.1, and McManus, 1991, 113). This embarrassing inconsistency is, of course, easy to resolve by accepting PIE *n̥, m̥* > PC *am, an*, which did not become Irish *im, in* or the like in front of a voiced stop before the fourth or fifth century A.D. to which this inscription can be plausibly dated. In that case [AM]B[I]CATOS is a genuine Primitive Irish form throughout and also the entirely regular precursor of OIr. *Imchado*.

The second piece of evidence points still more unequivocally to a relatively late Primitive Irish *an* > *in*, this time before *g*. OIr. *ingor* 'anchor' < Lat. *ancora* is arguably one of a group of pre-Christian Latin borrowings associated with maritime trade (McManus, 1983, 42-4). After pointing out the lack of a satisfactory explanation for *in-* rather than the *an-* predicted by conventional assumptions about historical Irish phonology, McManus rightly insists that 'whatever about its form, however, *ingor* is surely one of the oldest Lat. loan-words in the Irish language' (1991, 60, n. 117). As well as establishing the early sixth century A.D. as a *terminus post quem non* for its adoption, substitution of *nd/g* for Lat. *nt/c* here (cf. OIr. *ungae* 'ounce' < Lat. *uncia*) rules out borrowing before the roughly third-century but at any rate pre-Ogam Irish change of *nt* > *d* that made it necessary (if borrowed earlier than this, *ancora* would have produced OIr. **écor*). The failure of **ingora* (< **angora* for *ancora*) to undergo lowering to **engora* is puzzling in view of *tengae* 'tongue' < **teng^{w}āh* < **tĭng^{w}āh* < **tang^{w}āt-s* or 3pl. *-cengat* < **kĭng-o-nt(i)* alongside 3sg. *-cing* 'steps' < **kĭng-e-t(i)* (< **keng-e/o-*). The problem could be resolved if the form borrowed were *ankura* closer to or identical with the Greek original, but a borrowing from a Greek seafarer seems a distinctly long shot and remodelling of the Latin under the Greek form's influence is hard to envisage in the non-learned milieu to which Irish apparently owes this early loanword (but see Schrijver, 1993, 50 on the possibility of a Vulgar Latin pronunciation **ankura*). Whatever about its real or apparent resistance to lowering, its source Lat. *ancora* leaves no room for doubt about *ang-* > *ing-* yielding OIr. *ingor*.

Since it will emerge later (IV.2.4) that the basic divergence between *an, am* and *in, im* before a voiced stop can only be explained with reference to a following vowel, the change of *an, am* to something like *in, im* in appropriate environments must have occurred before the loss of final syllables in Primitive Irish around 500 A.D (*LHEB* 143). Accordingly, the hitherto intractable problem of the fronting of *a* in *ingor* < *ancora* can be straightforwardly

resolved by positing a fifth-century date for the loan at latest and regular Primitive Irish *an/m* > *ɪn/m* before a voiced stop in certain combinations by the end of that century. Ogam [AM]B[I]CATOS > OIr. *Imchado* can, of course, also be covered quite easily by dating this conditioned change *an/m* [æn/m] > *ɪn/m* to, say, some time in the fifth century.

2.7 There can, then, be no reasonable doubt that before a voiced stop pre-Celtic *n̥, m̥* yielded Irish *an, an* in some contexts at least (notably *land* in 2.4c) and that *an/m* were fronted to *ɪn/m* in others as late as the fifth century A.D. Obviously any *an/m* < *n̥, m̥* by a much earlier Proto-Celtic change would inevitably have been affected by the latter, thus covering 2.4(e) above and making, say, OIr. *ingen* 'nail' < **ŋg^{w}ina* < **æŋg^{w}inā* < **aŋg^{w}-* < **h$_{3}$n̥g^{wh}-* or *imbe* 'of butter' < **ɪmbēh* < **æmbē-s* < **ambē-s* < **h$_{3}$n̥g^{w}én-s* perfectly viable. Indeed, Ogam [AM]B[I]CATOS = OIr. *Imchado* makes PIE **h$_{2}$m̥b^{h}i* > PC **ambi* [æmbi] > Ogam Ir. /ambi/ [æmbi] > **ɪmbi* > OIr. *im(m)* virtually inevitable. As for the distribution of OIr. *an/m* vs. *in/m* in this environment, examples of the former appear to be confined to where a labial or dental voiced stop (*b, d*) was once followed by a back vowel *a* or *o*, the latter development being attested elsewhere. It is, of course, necessary to make the perfectly reasonable assumption that within a given paradigm synchronically anomalous alternations such as those between nom. sg. *camb* or *land* < **kambos, *landā* and gen. sg. **cimb, *linde* < **kambī, *landiyās* were eradicated in favour of the *a*-vocalism to give gen. sg. *caimb, lainde* and so on.

In this respect particular significance surely attaches to the otherwise problematical alternation between *camb* < **kambo/ā-* and *cimb(id)* < **kambi-(yati-)* above. To this may now be added the case of *and* 'in him/it, there(in)' vs. *ind-* elsewhere, notably as preverb or as prepostion in combination with other pronominal forms, e.g. *ind* 'into it/him', *indi* 'in her', *indib* 'in(to) you'. The inevitable comparandum for *ind-* is British *an(n)-*, Gaulish *ande-* 'in' cognate with OInd. *ad^{h}i* < **h$_{1}$n̥-d^{h}i* (cf. OLat. *endo-, indu-*), the corollary being that 'conjugated' forms such as *ind, indi* or *indib* derive from **and'-e(n)* < **and(e)-ed/m, *and'-iyī* < **and(e)-iyai, *ande-swis* respectively and so on (Ellis Evans, 1967, 136-41). Fronting of *and* to *ind* before *e* or *i* is, of course, in perfect conformity with the present hypothesis, which can then explain its failure to apply to *and* by straightforward derivation of the latter from an **andom* directly comparable with Hitt. *andan* and Gk. ἔνδον '(with)in' < **h$_{1}$n̥-dom*. In short, the Old Irish reflexes of a PIE syllabic nasal before voiced stop are not only quite compatible with PIE *n̥, m̥* > Proto-Celtic *an, am* but actually require such a postulate if a number of otherwise puzzling forms are to be accounted for satisfactorily.

The Irish and British evidence, then, fully accords with general *n̥, m̥* > *an, am* in Proto-Celtic and, if the acc. sg. of an OIr. fem. *ā*-stem like *túaith* 'tribe' is to be derived from **tōten* < **towtam* < **tewtām* (Cowgill, 1975, 49), there is clearly no difficulty in deriving, say, OIr. *deich* 'ten' from **deken* < PC. **dekam* < **dekm̥*. It has already been seen (II.5.1) that the Gaulish data in particular can be best accounted for by positing the late Proto-Celtic development of fronted allophones [æ] and [ǣ] of /a/ and /ā/ respectively (followed by shortening of vowels before *-m*) before nasal plus obstruent as well as before a double or final nasal, in which case the derivation of Old Irish acc. sg. *túaith* and num. *deich* can be straigtforwardly restated as < **tōθen, *dexen* < IC **tōtæn, *dekæn* < PC **toutæm, *dekæm* < **toutām, *dekæm* < **toutām, *dekam* < PIE **tewteh$_{2}$m, *dekm̥*. Moreover, this hypothesis of Proto-Celtic fronting of *a* to *æ* before a nasal in the environments specified is extremely neat as applied to the various Old Irish reflexes in 2.4. In the case of **-ans* > **-ās* in 2.4(a) the nasal was simply lost with compensatory lengthening prior to fronting, in 2.4(b) it is a straightforward case of unfronted PC *an/m* surviving unchanged to give OIr. *an/m*, and in the other environments fronted PC *æn/m* was either invariably raised/fronted still further (2.4d/f) or underwent a late split between retraction to *a* before a (non-high?) back vowel (2.4c) but otherwise fronting (probably via /e/ [ɪ]) to *i* (2.4e): e.g., PC **ban-om* > OIr. *ban* (2.4b), PC (**gannd-* >) **gænn(d)-* > OIr. *-geinn* (2.4d), PC (**landā* >) **lændā* > PrimIr. **landa* > OIr. *land* (2.4c) vs. PC (**ambi-* >) **æmbi-* (Og. AMBI-) > OIr. *imb-* (2.4e), PC (**ankus* >) **ænkus* > **ɛguh* > OIr. *éc* (2.4f).

3.1. THE GALLO-BRITISH HYPOTHESIS. The results of the above discussion of the reflexes of the PIE syllabic nasals *n̥* and *m̥* in Celtic may be summarised as follows. In Proto-Celtic these became *an, am* in all environments but were subsequently fronted to *æn, æm* before an obstruent, another (homorganic) nasal or in auslaut. The Celtiberian record shows no trace of this for the most part allophonic variation and it seems to have been largely given up in favour of *am* in British too. However, Gaulish and Irish do present clear reflexes of it and there are compelling reasons for thinking that the *en, em* or *in, im* presupposed by or actually attested in OIr. contexts 2.4(d)-(f) arose secondarily there from *æn, æm* < *an, am* at a demonstrably late stage of Primitive Irish that will be discussed further in the next chapter (IV.1.3 and 2.4). It follows from this that the ancestor of Goedelic had not yet split off from the rest of Celtic when the syllabic nasals were resolved into vowel (basically /a/) plus nasal. Since *k^{w}* > *p* has already proved an unreliable support for a distinct Gallo-British group within Celtic, it must be concluded that neither of the two criteria central to Schmidt's model in 1.1 has any genetic validity or constitutes a remotely serious obstacle to the hypothesis that within the Celtic family Irish and British are particularly closely related through a common

Insular Celtic intermediary.

John Koch's (1992b) recent advocacy of the case for Gallo-British has been subjected to telling criticism by Peter Schrijver, who points out that a number of the 'allegedly shared... developments... are typologically trivial' (1995, 464) and that three of the four remaining agreements deemed more circumstantial demonstrably took place later in British than in Gaulish and so cannot have arisen during a common Gallo-British stage. Thus although 'much has been made of the devlopment **nm* > **nw*, which is unknown to Irish but occurs in both Gaulish and British' as in OIr. *ainm*, OB *anu*, Gaul. *anuana* in II.3.3, 'it seems not to have been noticed that the Latin loan *mynwent* < **Munμent* < *monimenta* shows that we cannot assign a date before the LPBr. syncope (6th c. AD according to Jackson 1953) to the development in Welsh' (Schrijver, 1995, 463). 'All this points to the conclusion that the alleged Gallo-Brittonic developments belong to the early centuries AD, when both Britain and Gaul were dominated by Rome. They seem to have spread steadily from southern Gaul to Britain, in the same direction as Roman culture and all its concomitant features..... The relatively late spread of these linguistic features from Gaul to Britain tells us little about the relation between Gaulish, British and Irish in the centuries before the Roman occupation of Gaul and Britain. One may well argue that the period of Insular Celtic linguistic unity, when the characteristic Insular Celtic verbal system was developed, dates to before the Roman conquest of Britain' (Schrijver, 1995, 465).

This is a timely rejoinder to Koch's claim that 'the Insular Celtic phenomenon, where it diverges from Gaulish, can be explained as a result of common late survival and continued mutual influence within the British Isles after the cultural prëeminence of Celtic Gaul had been broken by the Roman conquest' (1992b, 495). It is far from clear why incorporation of Britain as well as Gaul into a Roman Empire noted for good communications should have ruptured linguistic interaction between the two across a narrow sea and fostered relations over a significantly wider piece of water between the British Celtic of the Roman province and its Goedelic counterpart on an island outside the Empire. This is not, of course, to deny the possibility of such contacts, particularly in the wake of Irish settlement in Wales in and after the fifth century A.D. Nevertheless, there is no *a priori* ground for according more weight to these than to comparable cross-fertilisation between Gaulish and British in the Roman period.

After briefly discussing the question of k^w and the syllabic nasals Russell resorts to a fudge regarding the relationship between Goedelic, Celtiberian, British, Gaulish and Lepontic: 'It is at least theoretically possible that all the sub-groups of the Celtic group are to be derived directly from Proto-Celtic... and that any striking parallels between sub-groups is *[sic]* due to subsequent contact between speakers. To point to one historically documented case, we

know that speakers of Brittonic and Gaulish were in contact in the 1st century BC... The difficulty is then merely displaced to deciding which features represent a genetic relationship as opposed to those which are due to language contact' (1995, 17-8). This, however, is a difficulty that should be confronted by serious evaluation of the alternatives rather than evaded by trite generalisations.

3.2 The upshot of the foregoing sections is that arguments for the early separation of Goedelic, for a specifically Gallo-British genetic node or for a clear distinction between Gaulish and Lepontic (cf. the diagram in 1.1) are neither individually nor cumulatively persuasive. The most serious phonological arguments deployed by Koch (1992, 484-91) in support of a further node shared by Gallo-British and Goedelic but excluding Celtiberian, namely the latter's supposed failure to share fully in the change $\bar{o} > \bar{u}$ in final syllables or in the monophthongisation of $ei > \bar{e}$, have been questioned in the previous chapter (II.5.3-4), where it was argued that both developments were probably Proto-Celtic. Doubts were also expressed there (II.5.3) about the validity of Goedelic, British(?) and Gaulish innovatory nom. pl. *-oi* as a criterion for genetic classification. The Celtiberian *o*-stem gen. sg. in *-o* vs. Goedelic, British(?) and Gaulish *-ī* only has diagnostic value if the possibility of innovation by Celtiberian here can be excluded, which is scarcely the case (McCone, 1992, 17; Eska, 1995; II.5.4). The separate locative seen in **somei** vs. dat. **somui** on Botorrita I looks more promising, given that locative forms are only attested in dative function in Irish and (so far) Gaulish. Nevertheless, this syncretism, which occurred independently in Greek, could have occurred separately in each (see 1.3 above) and so does not necessarily point to a common node from which Celtiberian was excluded. The significance of the Celtiberian ablatives **-uz**, **-iz**, **-az** etc. < **-ūd*, **-īd*, **-ād* identified by Villar (1995, 17-37; 1995b, 8-16) depends upon whether expansion beyond *o*-stem **-ūd* < PIE **-ōd* is viewed as a Celtiberian innovation, in which case their genetic import is slight, or as a Proto-Celtic or even Italo-Celtic feature, the absence of which in Insular Celtic and (so far) Gaulish would have more diagnostic value. In short, although the possibility cannot be ruled out, there is no conclusive evidence as yet that Celtiberian split off particularly early from the rest of Celtic.

4.1. LENITION. The obvious feature to take as a starting point for evaluation of the claims of Insular Celtic as a specific sub-node in the Celtic family tree is lenition, which is found in both Irish and British Celtic but is often assumed not to have been present in Gaulish or Celtiberian.

Considerations of economy clearly favour ascribing a date no later than Insular Celtic to the process responsible for turning *s* into *h* and voiced stops into the corresponding voiced frivatives (*b, d, g, m* > *v, ð, γ, β̃*) between a vowel and a resonant (vowel or *y, w, r, l, m, n*) as well as (probably) in post-

vocalic auslaut in both Irish (I.6.1) and British (I.4.2). Lenition would appear to have applied to *r, l, n* except in word-intial position or in contact with a homorganic consonant (i.e. before *t, d* and before or after *s, r, l, n*; Lewis and Pedersen, 1937, 48-56). At present distinctions of this type in the liquids and *n* are best preserved and variously realised in Donegal Irish and Scots Gaelic. Although it is not possible to establish the exact difference between unlenited *R, L, N* (written *r, l, n* or *rr, ll, nn*) and lenited *r, l, n* (regularly written *r, l, n*) in or before the Old and Middle Irish periods, the Welsh opposition between unlenited *rh, ll* /ɬ/ and lenited *r, l* clearly reflects a corresponding distinction in the British and presumably Insular Celtic liquids. In this case it seems likely that fortis and lenis doublets arose by strengthening in specific environments to yield the former rather than by weakening in others to produce the latter. Be that as it may, the voiceless stops were lenited to the corresponding voiceless fricatives in Irish (*t, k, k*^{w} > *θ, x, x*^{w}) but to the corresponding voiced stops in British (*p, t, k* > *b, d, g*), which makes their incorporation into a single comprehensive lenitional process before the separation of Irish and British a good deal more problematical.

Writing at a period when too little was known about Continental Celtic for the question of an Insular Celtic or a Proto-Celtic origin to be worth posing, Pedersen (*VKG* I 427-30) saw lenition as a development affecting 'virtually all non-syllabic sounds in Celtic' between a vowel and another resonant, suggesting that the discrepancy between Irish (len. /θ/, /x/ vs. unlen. /t/, /k/) and British (len. /b/, /d/, /g/ vs. unlen. /p/, /t/, /k/) treatment of voiceless stops could be rooted in a pre-separation opposition between unaspirated lenis /t/, /k/, /k^{w}/ and aspirated fortis /t^{h}/, /k^{h}/, /k^{wh}/. André Martinet (1952; 1955, 257-96), having rightly dismissed the possibility of the Irish and British lenitions being entirely independent of each other (1955, 262), suggested that a tendency to simplify postvocalic geminates pushed the old non-geminates towards a weaker articulation. As far as the stops were concerned, this entailed lenition of *p, t, k, k*^{w}, *b, d, g, g*^{w} to *b, d̠, g, g*^{w}, *v, ð, γ, γ*^{w}, the further suggestion being made that a similar development underlying the stops of Western Romance (basically France and the Iberian peninsula) might well be due to the influence of a Celtic substratum, although independent developments of so typologically probable a nature could hardly be ruled out. Here too the implication was that the seeds of the whole range of lenitions observed in Irish and British could be projected back to a common Celtic prototype. Confining himself to the stops, Koch (1990, 197-202) in effect combined these two approaches by positing a Proto-Celtic allophonic opposition between fortis [t^{h}], [k^{h}], [k^{wh}], [b], [d], [g] (to which [g^{w}] should now be added; II.1.2) and lenis [d̠], [g̠], [g̠^{w}], [β], [δ], [γ] (plus [γ^{w}]). Koch argues that this system survives virtually unchanged in British, allowing for /k^{w}/ [g̠^{w}] > /p/ [b̠] and a rather late tendency to voice the unaspirated voiceless stops represented by him as *b̠, d̠, g̠* to *b, d, g* in certain

contexts. In Irish too the only significant innovation was the late fifth-century change of the unaspirated voiceless stops *d̠, g̠, g̠*^{w} to the voiceless fricatives *θ, x, x*^{w} (> *x*). While paying lip service to a general opposition of some unspecified type between fortis and lenis consonants at an earlier shared phase, Jackson (*LHEB* 543-8) ascribes the final emergence of the attested differences between unlenited and lenited consonants in British and Irish to a separate unitary process across the board in each branch not only in virtually the same environments but also at about the same time, i.e. the second half of the fifth century A.D. (*LHEB* 560-1). The obvious reason for such caution even where British and Irish agree fully, notably in unlenited *b, d, g, m* vs. lenited *v, ð, γ, v̈*, would be the author's doubts firstly as to the genetic validity of Insular Celtic and secondly as to whether there was any reason to posit voiced fricative allophones *v, ð, γ, v̈* in Continental Celtic. Be that as it may, the similar, indeed often identical, independent developments posited by Jackson surely constitute too much of a coincidence to be credible.

Attractive though it is, Martinet's suggestion of substratum influence from Continental Celtic vernaculars characterised by lenition upon the consonant systems of Western Romance falls well short of proof that the former actually had *v*, ð, *γ* etc. The risk of a circular argument here can only be avoided by the presentation of positive evidence from Gaulish and/or Celtiberian sources for such lenition. In the absence of this, one would have little difficulty in following Pedersen in ascribing the unlenited/lenited oppositions seen in Old Irish (and British too, for the most part) directly to an earlier common phase, arguably best designated Insular Celtic, with the notable exception of voiceless *t, k*$^{(w)}$ vs. *θ, x*$^{(w)}$ for the good reason that it is extremely difficult to see how an Insular Celtic voiceless fricative could have become a voiced stop in British. Hence the need for some greater degree of abstraction here, the obvious candidate being an Insular Celtic or earlier allophonic opposition entailing aspirated [t^{h}], [k^{h}], [k^{wh}] postconsonantally and before certain other consonants versus unaspirated [t], [k], [k^{w}] between a vowel and another sonorant as specified at the beginning of this section. Although Koch is basically right to assert that 'prevocalically in absolute initial position, the voiceless stops are still aspirates [p^{h}, k^{h}, t^{h}] in all the living Celtic languages', the distributional fit between this feature and non-lenition or between non-aspiration and lenition remains far from perfect overall and one might anyway expect the aspirates to be more likely than the non-aspirates to develop into fricative *θ, x*$^{(w)}$ in Irish. After all, it is /p^{h}/, /t^{h}/ and /k^{h}/ that became /f/, /θ/, /x/ in the later history of Greek while /p/, /t/, /k/ remained unchanged and a similar development probably occurred in the prehistoric Italic stop system (Palmer, 1954, 227). Nearer home, the so-called 'spirantisation' of British Celtic (4.5 below) affected voiceless stops that were probably aspirated allophones for the most part. In short, it seems quite unlikely that arguable Proto- and/or Insular Celtic allophonic variation between aspirated and unaspi-

rated voiceless stops had any direct bearing upon the lenition of those stops in Irish and British.

One point that does not seem to have been made in the debate so far is simply this: as is clear from a number of other languages, it is by no means inevitable that lenition should affect voiced and voiceless stops simultaneously. For example, Ancient Greek /b/, /d/, /g/ have become /v/, /ð/, /ɣ/ in Modern Greek but /p/, /t/, /k/ underwent no parallel development to /f/, /θ/, /χ/ (Browning, 1969, 33-4). More pertinent still is the second lenition of /b/, /d/, /g/ to /v/, /ð/, /ɣ/ after various vowels and sonorants in Spanish in the absence of a corresponding transformation of /p/, /t/, /k/ (Littlewood, 1979, 21-6) or a similar lenition of voiced but not voiceless stops in Young Avestan (Jackson, 1892, 28 and 31-5). It thus seems perfectly permissible to date a 'first' lenition of voiced stops etc. a good deal earlier than a 'second' lenition of voiceless stops (see Sims-Williams, 1990, 227-36, for additional arguments along similar lines).

Although neither Old and Middle Irish nor Old Welsh orthography indicate the former lenition clearly (I.4.2 and 6.3), Modern Irish and Middle or Modern Welsh orthography do for the most part: e.g., OIr. *domun* /dov̆un/ 'earth' (ModIr. *domhan*), MW *dwvyn* /duvn/ (ModW *dwfn*) < *duv̆no-* < **dumno-* < PC **dub-no-* (Gaul. *Dumno-*, *Dubno-*) < IE **dʰ(e)ub-* (> Lith. *dubùs* 'deep', OE *dēop*); OIr. *slaide* /sʟað´e/ 'striking, killing'' (ModIr. *slaidhe*), MW *lladu* (/ɬaðü/, ModW *lladdu*) < PC **slad-*; OIr. *lige* /ʟiɣ´e/ 'lying' (ModIr. *luighe*, *lut*), MW *gwe-ly* 'bed' (< */lɪɣ/) < PC **(-)leg-yo-m* < PIE **legʰ-* (Gk. λέχ-ος 'bed', Got. *ligan* 'lie'). Of course, this lenition occurred under appropriate conditions not only within the word but also (as in the case of Spanish) across the word boundary in syntactically close groups, a development ultimately responsible for grammatical lenition in Irish and British: e.g., OIr. *a lám*, MW *y law* 'his hand' < **ehyo lāvā* < **esyo lāmā* but OIr. *a (l)lám*, MW *y llaw* 'her hand' < **ehyāh ʟāvā* < **esyās lāmā* with and without initial lenition respectively; OIr. *in benn már* /iN veN v̆ār/ 'the great peak' (ModIr. *an bhinn mhór*), MW *y vann vawr* < **indā vannā v̆ārā* < **(s)indā bannā mārā* with initial lenition (nom. sg. f.) but OIr. *in bráthair már* /in brāθər´ mār/ 'the large brother' (ModIr. *an bráthair mór*), MW *y brawd mawr* < **(s)indos brātīr māros* without it (nom. sg. m.). Since lenition across the word boundary seems unlikely to have come about independently in the two branches, this striking parallelism presumably has is roots at least as far back as Insular Celtic. The next question is whether it originated still further back in Proto-Celtic itself.

4.2 Ellis Evans (1967, 400-4) presents a clear and well-referenced discussion of the arguments and evidence for and against lenition of stops in Gaulish, concluding that spelling confusion in sources in the Roman alphabet between *c* and *g* especially can hardly be due to a British-style lenition of intervocalic voiceless to voiced stops but probably reflects a discrepancy between the status of voiceless stops in Gaulish and Latin (I.2.4). Certainly such confusion bears no obvious relation to Insular Celtic lenition since it is not confined to post-vocalic position but also occurs initially as well as after a liquid and, moreover, affects not only old /k/ but also old /g/: e.g., *Glanum* or *Clanum*, *Argantomagus* or *Arcantodan*. 'There is, however, a tendency for intervocalic *g* to disappear. This suggests that in medial position it was sporadically weakened in articulation. Examples: names in *rio-* beside names in *rigo-*.....: *Caia*.... *Cagius*...; *Maionus*... *Maiorix*..... *Magiona*... *Magiorix*.....' (Ellis Evans, 1967, 400). Since it seems to occur chiefly in the vicinity of *i*, this Gaulish loss of *g* might perhaps be compared with Lat. *maius* < **magyos* rather than taken as straightforward evidence for a lenited pronunciation of /g/ as [ɣ] between a vowel and another sonorant, the guttural then tending to be lost relatively late and perhaps no more than locally next to *i* especially. Nevertheless, the explanation based on lenition is the obvious one in view of an independent general loss of /ɣ/ a good few centuries later on the way from Old to Middle Welsh (I.4.3). It is also important to realise that, if Gaulish did have both voiced stops [b], [d], [g] and the corresponding fricatives [v], [ð], [ɣ] as complementarily distributed allophonic variants, it would be surprising if both were not regularly spelt *b*, *d*, *g* (as in present-day Spanish) in the absence of special signs for the fricatives in contemporary Latin orthography. Only phonemicisation of the opposition, an extreme case being complete loss of one variant, would be likely to lead to its being given orthographical expression but even this would be far from inevitable, as the spelling systems of Old Welsh (I.4.2) and Old Irish testify (I.6.3). Thus, although the evidence is suggestive rather than conclusive, Gaulish seems more likely than not to have had a purely allophonic opposition between voiced stops and corresponding voiced fricatives virtually identical to the one that was eventually phonemicised in Irish and British.

The evidence of Continental Celtic on this point has been dramatically transformed by Villar's recent discovery (I.3.5) that Celtiberian had a voiced as well as a voiceless sibilant phoneme now to be transcribed *z* and *s* and that the former was the normal outcome of /d/ intervocalically, in postvocalic auslaut and perhaps between any two sonorants. The only reasonable explanation for this is that /d/ was pronounced [ð] in these contexts and then converged with the voiced outcome of /s/ between sonorants to produce a new phoneme /z/ or perhaps /ð/. After a detailed examination (1995, 153-78) of the evidence of numerous placenames in the Iberian peninsula containing the element *-briga* (see II.1.4), *-bria* or the like, Villar remarks: 'This distribution poses an interesting problem which, unfortunately, will remain unanswered for now. I refer to the fact that the loss of intervocalic /g/, traditionally connected with Celtic lenition, prevails in the Latin form *-briga* (> *-bria*) as a substratum

phenomenon in the west and not, on the other hand, in Celtiberia where the Celticity of the population is more obvious and more concentrated. There were, of course, Celts in the west, as we know through various channels. However, there was also another type of population, the Celtic character of which is at least debatable. As I have said, in Celtiberian epigraphy we have only one instance of loss of intervocalic /g/ (*tuateros* and *tuate[r]es* < **dhugəter-*), although there are other more secure indications that the fricative articulation of the voiced stops (the first stage of the process of lenition) was effectively under way. On the other hand, it is necessary to relate this to another western phenomenon, also interpreted as the result of lenition, namely the voicing of the voiceless stops. Signs of this phenomenon in Celtiberian are minimal, whereas in the west they are overwhelming. In a word: the effects of Celtic lenition are more abundant and concentrated in the west (where the Celtic population is less homogeneous) than in Celtiberia itself' (1995, 178-9).

As far as Celtiberian is concerned, absence of the expected guttural in **tuater-** (II.4.2) is certainly easier to envisage if intervocalic [ɣ] rather than [g] was missing, even though it remains a mystery why the guttural was lost here and not in other similar environments (*uγa* > *u(w)a* as opposed to retention of γ in most other intervocalic environments?). At any rate, there would be little alternative to representing a still pronounced allophone [ɣ] of /g/ as **ka, ke** etc. in the Iberian alphabet.

The upshot of good Celtiberian evidence for postvocalic lenition of *d* to *ð* combined with a number of Gaulish forms plus at least one from Celtiberian indicating a precisely parallel *g* > γ then liable to sporadic loss is surely quite a strong presumption that the lenition of voiced stops to the corresponding voiced fricatives firmly attested in Irish and British was also characteristic of Continental Celtic and hence is very likely to have been a feature of Proto-Celtic. As far as the labials are concerned, Proto-Celtic **a/own-* > **a/ovn-* might be regarded as more natural than **a/own-* > **a/obn-* (II.3.1), in which case it would be easiest to suppose that a sound [v] had already been brought into being by lenition of /b/. If a form like **dubnos* really was [duvnos] in Proto-Celtic, then the assimilatory nasalisation seen in Gaulish *dumno-* alongside older *dubno-* was presumably to [duṽno-] comparable with the Insular Celtic [duṽnos] underlying OIr. *domun* /doṽən/ 'world' and MW *dwvyn*. The Proto-Celtic dissimilation of /mw/ to /w/ (II.3.1) could perhaps be still more persuasively restated as [ṽw] > /w/.

On balance, then, the evidence points to a first or Proto-Celtic lenition of the voiced stops /b/, /d/, /g/ and perhaps also the nasal /m/ to the corresponding fricatives [v], [ð], [ɣ] and more doubtfully [ṽ] between a vowel and any sonorant within the word. It would hardly have been possible for /b/ or /g/ to stand in postvocalic auslaut at this stage but the Celtiberian evidence suggests that /d/ was lenited to [ð] in this position, in which case Proto-Celtic probably

did not tolerate postvocalic final stops (I.3.5). On the other hand, the change *-m* > *-n* attested in Gaulish and Irish can be seen as an indication that /-m/ had not yet been lenited to /-ṽ/ in postvocalic auslaut, perhaps because its nasality gave it the aspect of a continuant, and this might call into question its lenition elsewhere after a vowel in Proto-Celtic. It has emerged from the foregoing that there is no unambiguous evidence for voicing or any other sort of lenition of voiceless stops in either Gaulish or Celtiberian and that the Celticity of this phenomenon in the western Iberian peninsula is open to dispute. In any case, the Primitive Irish lenition of voiceless stops to voiceless fricatives (4.4 below) firmly rules out any possibility that voiceless stops had been voiced in leniting environments as early as Proto-Celtic.

There would seem to be no good evidence for lenition over the word boundary in Continental Celtic. Given that the lenition of *b, d, g* and perhaps *m* was not normally indicated in Gaulish orthography, lack of clear examples of this phenomenon after words ending in a vowel obviously proves nothing. The same goes for Celtiberian except in the case of **z** /z/ or /ð/ for lenited **t** /d/, where examples such as **nekue taunei... nekue masnai tizaunei...** (*Bot.* I A2) seem to imply unlenited postvocalic [daunī] and [dīzaunī] rather than lenited [zaunī] and [zīzaunī] that one might have expected to be spelt ***zaunei*** and ***zizaunei***. However, it scarcely follows from the normal indication of such lenition inside the word that phonetic **z-** [z] would have been written in place of basic **t-** /d/ at the beginning of a word, even if allophonic lenition had applied in such cases (cf., as Peter Schrijver has pointed out to me, Middle Breton representation of lenition of *d* > *z* internally but not initially even though it is phonemic there too). There is thus no conclusive evidence either way and all that can be said is that lenition across the word boundary is not yet definitely attested outside Insular Celtic.

4.3 As can be seen from the contexts specified at the beginning of 4.1 above, in Insular Celtic it was rather the case that inherited /n/, /r/ and /l/ were strenghthened to [N], [R] and [L] in certain non-leniting environments than that lenition took place in the normal way. As yet there is no good reason for ascribing a Proto- rather than an Insular Celtic date to this peculiar development, one admittedly rather weak argument against the former being the Celtiberians' lack of interest in the second *r*-sign of the Iberian alphabet (I.3.5).

Lenition of *s* to *h* between a vowel and another sonorant as well as in postvocalic auslaut can hardly have taken place as early as Proto-Celtic in view of the intervocalic *z* reflex in Celtiberian (I.3.5), since this is a very natural outcome of *s* (cf. intervocalic *s* > *z* in Oscan and *s* > *z* > *r* between vowels in Latin and Umbrian; Buck, 1928, 74; Palmer, 1954, 230) but seems quite implausible as a development of *h*. Indeed, apart from probably PC *-m(m)-* < *-sm-* (II.2.1), there is no evidence for loss of *s* in any position in Celtiberian. In Gaulish 'IE *s* was normally preserved initially and medially between

vowels..... Final *-s* is commonly retained..... But there are also quite a number of examples showing the loss of *-s*..... In the Latin of Gaul *-s* was generally maintained. But forms without *-s* are certainly not hard to find in texts other than the Celtic inscriptions, especially in potters' stamps' (Ellis Evans, 1967, 397; see McCone, 1994, 277-8 on Gaul. SUIOREBE). Examples of initial *h* for *s* and loss of intervocalic *s* are extremely rare in Gaulish, while better attested loss of final *-s* is found too late and sporadically for a connection with lenition of the same to *h* and then non-initally to zero in Insular Celtic to be at all likely. Loss of postvocalic *-s* as a sandhi phenomenon in Proto-Celtic in front of *m-*, *n-*, *r-*, *l-* seems a possibility if the assimilation in II.2.1 occurred over the word boundary, in which case *sm-*, *sn-*, *sr-*, *sl-* would have been generalised from non-postvocalic environments in OIr. (the last three then secondarily acquiring lenited *hn-*, *hr-*, *hl-*) and *mm-*, *nn-*, *rr-*, *ll-* from postvocalic ones in British. A nucleus of forms without *-s* that arose in this way may perhaps have been expanded somewhat in later Gaulish. However, this is far from certain and anyway cannot be considered lenition as such. Apart from chronological problems, loss of *s* in Gaulish simply does not occur in the same environments as in Insular Celtic, where *-h* was not lost in auslaut until quite late in the separate prehistories of Irish and British (IV.1.2 and 4.2). Consequently there is no evidence in Continental Celtic to prove that lenition of *s* to *h* in any position was a Proto-Celtic phenomenon.

On the other hand, Schrijver (1995, 377-83) has convincingly vindicated the view that lenition of *s-* to *h-* was characteristic of both Irish and British but that the resultant grammatical mutation was abandoned in the latter, mostly in favour of *h-* but sometimes in favour of *s-* throughout, dual reflexes of one and the same root being particularly significant; e.g., MW *hed(d)* 'peace', *sed(d)* 'seat' < **sedos*, *hil* 'seed, offspring, race', *sil* 'race' < **sīlom*, *hawdd* 'easy' < **sādo/ā-*, *seith* 'seven' < **sextam*. That being so, postvocalic lenition of *s* to *h* seems to be reflected in exactly the same contexts in Irish and British, namely -V *s*R-, (-)V*s*R- or (-)V*s* (V = vowel, R = any sonorant including a vowel), and almost certainly originated in Insular Celtic.

At first sight Ogam spellings such as -CUNAS, -CONAS and -CONA (OIr. *-chon*) seem to represent /kunas/, /konas/ and /kona(h)/ and thus to imply that /-s/ survived lowering before becoming /-h/ and then *-Ø* prior to the loss of final short vowels known as the Primitive Irish apocope (McCone, 1982, 24-5). However, this is an uncomfortably squeezed chronology entailing *-s* > *-h* (retained before and then transferred to a following vocalic anlaut on the clear evidence of later Irish) > *-Ø* in about half a century at most and DRUGNO beside DROGNO (*u-* or *i*-stem gen. sg. seen in the sept name *Uí Dróna* according to Ziegler, 1994, 172) rather suggests that weakening to /-h/ at least had occurred before lowering. In that case post-lowering examples like -CONAS are to be read as /kona(h)/ and the possibility that Ogam -S generally represented /-h/ seriously entertained. Given that the Ogam alphabet in all probability did not originally possess a special sign for /h/ (McManus, 1986, 24-9) and that Ogam S in anlaut like its Old Irish counterpart (prior to the ninth-century adaptation of the *punctum delens*) will have stood for /s-/ or in leniting contexts /h-/ just as T(T) represented /t/ or /θ/ and so on, there were only two possible ways of dealing with /-h/ in this orthographic system: it could either be ignored altogether or else represented by S in its secondary (lenited) value. There is, then, no compelling reason to ascribe the value /-s/ rather than /-h/ to -S in auslaut on any Ogam inscription (I.5.2).

Consequently we can posit a second or Insular Celtic lenition of *s* > *h* that definitely operated across the word boundary in syntactically close groups and may well also have entailed lenition of postvocalic *b-*, *d-*, *g-*, *m-* over the word boundary as opposed to within the word, where lenition of the voiced stops and arguably of *m* too had very probably already occurred in Proto-Celtic (4.2).

4.4 The Irish lenition, which transformed the voiceless stops *t*, *k* into the corresponding voiceless fricatives *θ*, *x* intervocalically, between a vowel and a resonant or in postvocalic auslaut in Irish, must be located before the loss of *-h* and *-n*, which logically preceded the loss of final short vowels known as the 'general apocope' around 500 A.D. (IV.4.3). If it had not taken place before this, alternations such as OIr. *in chloch thromm* 'the heavy stone' < **indā xloxā θrumbā* < **(s)indā klokā trumbā* (nom. sg. f.) vs. *in cailech tanae* 'the thin cock' < **indah kaliyaxah tanawiyah* < **(s)indos kaliākos tanawyos* would defy explanation.

Jackson (*LHEB* 122-48) dates Irish lenition to the second half of the 5th. century A.D. because it affected words such as MidIr. *ortha* 'prayer' < Lat. *oratio* borrowed into Irish from British Latin around the middle of that century in the wake of Patrick's mission. However, this leads as usual to a very tight chronology and the basic argument is hardly compelling since it would be quite natural to adapt such loans to the phonetic system of Irish at the time, which would have entailed two complementarily distributed allophones of each single consonant, namely a lenited variant between a vowel and another resonant or the word boundary as opposed to an unlenited variant (quite likely still phonetically geminated between vowels) everywhere else. That being so, Lat. *orātio* would presumably have been borrowed as **oraθ'iyu* (> OIr. **orthu* > MidIr. *ortha*) even if the Irish lenition had already taken place. Consequently it is not possible to ascribe a more precise date than one between the beginning of Proto- and the middle of Primitive Irish to the lenition of *t*, *k*, *k*^{w} > *θ*, *x*, *x*^{w}. Ogam orthography does not recognise this lenition (McManus, 1991, 85-7), although it must have been in effect at least by the time of later inscriptions reflecting loss of final syllables: e.g. Ogam QRIMITIR RONANN MAQ COMOGANN

/kʷriṽiθir´ rōnān´ ṽak´ xoṽoɣān´/ '(the stone) of the priest Rónán son of Comgán' = OIr. *cruimthir Róná(i)n maic Comgá(i)n*.

Kortlandt offers the following ingenious argument for what would then be a second Irish lenition. 'Since **-nt-* and **-nk-* did not merge with **-nd-* and **-ng-*, which remained unchanged, the voicing of **t* and **k* in the former sequences must have been posterior to the loss of the nasal. Thus, I assume that the intervocalic stops in *cét* < **kentan* 'hundred' and *éc* < **enkuh* 'death', Mod. Ir. *céad* and *éag*, became the new intervocalic variants of /t/ and /k/ when the nasal was lost. At the same time the intervocalic fricatives **θ* and **x* received the status of a phoneme..... This development was independent of and apparently earlier than both the simplification of geminates and the loss of final **h*. When final **h* was lost, new intervocalic stops arose and the lenited variants of the voiced occlusives received the status of a phoneme, so that the alternation became a grammatical one. The intervocalic stops which had arisen from the original sequences **-nt-* and **-nk-* now merged with the unlenited stops /d/ and /g/ respectively, so that we arrive at the characteristic Irish alternation between unlenited /t/, lenited /θ/, and nasalized /d/.... Thus, the chronological analysis attempted here leads to the paradoxical conclusion that the rise of a grammatical alternation between /t/ and /θ/ was caused by the loss of a preceding **n*, whereas the rise of a grammatical alternation between /t/ and /d/ was caused by the loss of a preceding **h*' (1982, 78-9).

Given the argument below (4.5) that voiceless stops in British underwent a first postvocalic lenition to *b, d, g* and then, after the loss of various consonants that had impeded this, a second postvocalic lenition to *f, θ, x*, there can be no fundamental objection to positing a comparable two-tier process in Irish, the difference being that in this case the voiceless fricatives were the result of the first lenition and the voiced stops were due to a second postvocalic lenition after loss of *n* before a voiceless stop. Since Ogam inscriptions present a couple of examples of loss of *n* plus voicing and none of retention of *nt* or *nk*, it seems likely that *nt, nk* > *d, g* had been completed before the fifth century. Acceptance of Kortlandt's explanation thus necessitates a still earlier date for lenition of *t*, $k^{(w)}$ to *θ, x*.

However, although this scenario is a serious possibility and has been combined by Schrijver (1993, 33-5) with nasalisation of a preceding vowel before loss of /n/, it is not the only one capable of accounting for the facts. According to Thurneysen, 'the stages of this development were probably as follows. First, *k* and *t* were intensified (geminated), as after *r* and *l*... The nasal then coalesced with the preceding vowel into a nasal vowel... After these nasal vowels the geminates became voiced (*gg, dd*). Subsequently *i, o, u* lost their nasal quality and became *i, o, u*, while *a* and *e* fell together as the nasal vowel *e*. The latter was lengthened, perhaps only when stressed, and later changed

into purely oral *ē* (or *e*)' (*GOI* 127). Shorn of the gratuitous assumption of gemination, this explanation seems quite viable. However, a further distinct possibility is Greene's view that 'the nasal was certainly a lenis when the stop was unvoiced, for the development from *-n*K-, *-n*T- through *-nG-, -n*D- to -G-, -D- (exactly paralleled in Modern Greek...) is already completed in the Ogam inscriptions. Since there is no confusion between this series and *-n*D-, *-n*G- we may assume that the nasal in these had become a fortis at an early date' (1960, 105-6). The advantage of Greene's explanation is that it is based upon well established voicing tendencies on the part of nasal stops and upon an actually attested strengthening of *n* to *N* before *d* (I.4.1) that can easily be extended to position before *g*. Hence **ænguh* > **æNguh* > OIr. *ing* 'straight' but **ænkuh* > **ænguh* > **ɛguh* > OIr. *éc* 'death' and so on. Admittedly strong *N* is found before *t* as well as *d* in Old Irish, but OIr. *-(n)nt-* only came into being after syncope.

In conclusion, Kortlandt's explanation of *nt, nk* > *d, g*, while feasible, is not secure as a criterion for dating lenition of *t*, $k^{(w)}$ > *θ*, $x^{(w)}$ in Irish to the fourth century A.D. or earlier, although Jackson's case above for the later fifth century remains far from compelling. Indeed, it must be considered virtually impossible when it is recalled that no less than three successive stages require completion before the loss of a final short vowel that is to be equated with the so-called 'apocope' of c. 500 A.D. (IV.4.3), namely postvocalic *-t* > *-θ* (Irish lenition), *-θ* > *-h* (IV.4.1) and *-h* > Ø (IV.4.2). That being so, it is difficult to date the Irish lenition of *t*, $k^{(w)}$ to *θ*, $x^{(w)}$ much later than the beginning of the fifth century, regardless of whether or not one accepts Kortlandt's explanation, and a date in or even before the fourth century can hardly be ruled out.

4.5 Like its Irish counterpart, the first British lenition of voiceless to voiced stops between a vowel and a sonorant must have occurred before the loss of old final consonants/syllables in British in order to explain the dichotomy between, say, MW *y gadeir drom* 'the heavy chair' < **indā gadeyrā drombā* < **(s)indā kateðrā trumbā* and *y cledyf trwm* 'the heavy sword' < **indah klaðivah trumbah*. It can be more precisely dated with the help of British Latin loanwords in Irish. It follows from the high likelihood that British Latin was basically pronounced in the native manner (I.4.2) that OIr. loanwords such as *cucann* /kugəN/ 'kitchen' < Lat. *coquina* /kogīna/, *Laiten* /lad´ən/ 'Latin' < Lat. *Latina* /ladīna/, *notaire* /nodər´e/ 'amanuensis' < Lat. *notarius* /nodɔ̄riuh/, *eclais* /egləs´/ 'church' < Lat. *ec(c)lesia* /eglēsia/, *loc(c)* /log/ 'place' < *locus* /loguh/, *sacart* /sagəRd/ 'priest' < Lat. *sacerdos* /sagerdōh/ were absorbed after British lenition of voiceless to voiced stops (e.g. *LHEB* 127-8). Since the precursor of a form like *cucann* demonstrably predates the three crucial pre-apocope developments listed in IV.2.1 and that of a form like *notaire* likewise dates from before the pre-apocope shortening of unstressed

vowels, Jackson's view that borrowings of this type 'all seem to be later than the loss of final syllables in Irish' (*LHEB* 143) cannot be sustained (see I.6.6 and VI.2.5 on McManus' model, on which the discussion here is based). On the contrary, the first loanwords reflecting British voicing must have come into Irish before the three successive changes just referred to, all of which Jackson (*LHEB* 143) would squeeze rather too closely for comfort into the second half of the fifth century. That being so, Jackson's claim that 'the Late British lenition... took place in the second half of the fifth century' (*LHEB* 561) should surely be revised to under no circumstances later than the middle and perhaps nearer to the beginning of that century.

Obviously loanwords that do not reflect British lenitional voicing such as MidIr. *ortha* 'prayer' in 4.4 above or OIr. *cuithe* 'pit' < Lat. *puteus* (I.6.6) must then be still older than this. Since this stratum contains an earlier group, to which *cuithe* belongs, with substitution of Irish *k*^{w} (> OIr. *c*) for Latin *p* and a later one, exemplified by OIr. *pairche* < Lat. *paruc(h)ia*, *pridchid* 'preaches' < Lat. *pr(a)edicat*, *peccath* 'sin' < Lat. *peccatum*, with no such substitution (McManus, 1983, 37-41), Old Irish words reflecting *k*^{w} for Latin *p* would seem to be particularly old and quite unlikely to have been borrowed after the first couple of decades or so of the fifth century. So early a date for Christian Latin borrowings such as OIr. *cásc* 'Easter' < *pasc(h)a* is perfectly compatible with Prosper's information that there were already Christians in Ireland when Palladius was sent as 'first bishop' in 431 A.D. (cf. I.5.1). It has the further more striking corollary that, in the likely event that OIr. *Cothrige* ultimately reflects the original Irish form **K*^{w}*aθrixiyah* of the Latin name *Patricius* as convincingly reasserted by Koch (1990) against Harvey (1985), Mario Esposito's (1957) hypothesis that Patrick's mission actually preceded that of Palladius receives linguistic corroboration, as argued by Koch (1990) along somewhat different lines.

What will here be termed the second British lenition is described as follows by Jackson. 'British *pp, tt, cc, lp, rp, rt, lc, rc* of whatever origin give in WCB. respectively *f, th, ch, lf, rf, rth, lch, rch*. There is no need to discuss here how this happened, a matter on which there has been some dispute; though in the case of *lp, rp, rt, lc* and *rc* it may be noted that the stops were very likely geminates in these consonant groups..., so that they would develop in the same way as *pp, tt, cc*' (*LHEB* 565). This implies that this was not a lenition as such but rather a peculiar British transformation of voiceless geminate stops. At the end of his celebrated article debunking the (morpho)phonemic status of gemination in Old Irish Greene demurred: 'I take it that consonants in sandhi with final *-s, -t, -k* in Welsh, as well as final *-n* in Breton, were preserved strong, in all cases. After the loss of final syllables the tenues were weakened for lack of opposition and were then further weakened to *f, th, ch* in all leniting positions - a weakening of the same type as the earlier lenition of the mediae.

The same weakening occurred after particles which now ended in a vowel (final *-s, -t, -k* and, in Breton, *-n*, having dropped before consonants) - e.g. *y* 'her', *tra, a* and so on..... I take the development of this mutation as more or less contemporary with the rise of provection. It was the latter process which provided a new series of tenues (*p* from *b* + *b*, *b* + *h* etc.); ..... it is not impossible that it was their appearance which hastened the weakening of the old tenues - at least it is certain that the two series are never confused' (1956, 289). Apart from clarifying his own position somewhat, Jackson's (1960) prickly restatement of 'orthodoxy' added nothing of significance to the argument but did prompt Greene (1966) to offer a more detailed evaluation of the structural implications of the two approaches that exposed a number of weaknesses and inconsistencies in Jackson's position. The latter's post-apocope date of 'the middle and second half of the sixth century' (*LHEB* 567) for this development was accepted by Greene (1956, 289).

For Greene, then, this second lenition applied after the loss of final consonants and/or syllables in British to postvocalic or postliquid voiceless stops that had been unaffected by the first lenition because at that time they had either been geminate or else preceded by a consonant that was subsequently lost or, in the case of *r* and *l*, non-leniting: e.g., **ehyo peNo-* > (1st. len.) **eyo beNo-* > MW *y ben* 'his head' but **ehyāh peNo-* > **e peN* > (2nd. len.) MW *y phen* 'her head', Lat. *corpus* > **corp* > MW *corf(f)* 'body', **Nerto-* (OIr. *nert*) > **Nert* > MW *nerth* 'strength', Lat. *bucca* > **bokkā* > **bok* > MW *boch* 'cheek', **wolk-* (OIr. *folc-*) > **gwolk-* > MW *golch-* 'wash'. The development *xt* > *yθ* seen in MW *seith* 'seven' < **sext* etc. is treated quite separately and dated to the late sixth or early seventh century by Jackson (*LHEB* 407-11) but seems so close to postvocalic and postliquid *t* > *θ* etc. on his chronology that a sequence V*xt* > V*yt* > (2nd. len.) V*yθ* surely makes better sense, in which case *y* joins *r* and *l* and we can talk of a pan-British second lenition after any non-nasal sonorant. Certainly there seems to be no insuperable obstacle to a slightly later date (say, c. 600 A.D.) than Jackson's for *t* > *θ* etc.

After a liquid, voiced as well as voiceless stops changed into the corresponding fricatives in British: e.g., MW *twryf* 'tumult' (Mod. *twrf*) < **turv* < *turb* < Lat. *turba* (cf. *corff*), MW *bard* 'bard' (Mod. *bardd*) < **barð* < **bard* < **bardos* (OIr. *bard* /bard/; cf. *nerth*), MW *hely* 'hunt(ing)' < **helγ* < **s/helg* < **selgā* (OIr. *selc/g* /selg/; cf. *golch-*). Jackson (*LHEB* 433 and 466) connects this with lenition of *b, d, g* > *v, ð, γ*, dated by him to around the middle of the fifth century in British (as Irish). Since, however, it now appears that this lenition of *b, d, g* after a vowel is at least as old as Insular and probably as old as Proto-Celtic (4.1-2), the two phenomena must be separated for the simple reason that Old Irish shows clear reflexes of *b, d, g* > *v, ð, γ* between vowel and resonant but, as indicated by the examples just

given, displays no such lenition after a liquid (or nasal). That being so, there is an obvious parallelism between the treatment of voiceless and voiced stops after a liquid in the two branches (OIr. RT/D vs. Brit. RΘ/Đ), as Greene pointed out: 'I think the evidence points to the continuants having been weak and the stops strong. If we take first the groups where the stops are voiced, this is the case for Irish, but not for the Brythonic languages (Ir. *cerd*, W. *cerdd*, etc.), and Sommerfelt takes it that Irish is the innovator here.....; what seems to me much more cogent is the fact that, in the case of similar clusters with unvoiced stop, (i) the stops in both Goidelic and Brythonic were originally fortes and (ii) in Welsh and Breton they normally appear as spirants. I have already suggested (*Celtica* iii 289) that this development was a weakening of the same type as the earlier lenition of the mediae in the same position; to object to this, as does Bachellery (*Etudes Celtiques* viii 253) on the grounds that lenition realized as spirantization is unknown in Brythonic is simply to beg the question' (1960, 103). Despite this perceived parallelism, Greene nevertheless ascribes both developments to different chronological stages in line with Jackson's overall scheme.

In Harvey's opinion 'the asymmetry lay in the fact that whereas the voiced consonants subsisted in both stop and spirant phonemes (for example, /d/... versus /ð/...), unvoiced consonants existed phonemically only as stops... in Brythonic at this time - in other words, there are *t*s but no *θ*s... There was therefore the opportunity, without disturbing the distribution of phonemes, for the voiceless stops to become spirantised at a purely realizational level, as prompted by the phonetic environment. It is to be noted that in practice this change appears to have taken place in all environments except absolute anlaut' (1984, 97-8). Harvey goes on, albeit without acknowledgement, to elaborate Greene's suggestion that the production of new voiceless stops by provection may have played a significant role on the grounds that 'it will have been systematic pressure from the new voiceless stops... which caused the *old* voiceless consonants to select their spirant variants in opposition, and so achieve the status of spirant phonemes. The fact that the old voiceless consonants did not undergo spirantization in absolute initial position can now be explained in the light of this view, since it was in that position alone that no new stops arose by provection' (1984, 99).

In effect, this analysis brings the structuralist concept of 'functional load' (Bynon, 1983, 87-9) into play by arguing that spirantisation (or, to use the term preferred in this section, second lenition) only occurred where the distinction between stop and fricative had no functional load, i.e. in the voiceless as opposed to the voiced series. However, it takes no account of the fact that voiced as well as voiceless stops became fricatives after a liquid, a deficiency that led Russell to recommend 'a slight alteration in our perception of the changes involved. It is assumed by Jackson and others that spirantization can

only affect unvoiced stops because that is where it is perceptible, that is, that the spirantized version of *-t-*, namely *-θ-*, is distinct from the lenited form *-d-*. On the other hand, the spirantised forms of *-d-* and *-m-*, that is *-ð-* and *-μ-*, would have been identical with the lenited forms. A simpler view, therefore, would be to take all of them as representing spirantization of the unlenited stops and resonants' (1985, 54). This, however, proves to be a case of swings and roundabouts. 'In conclusion, then, it may be supposed that the phenomenon of spirantization after *-r-* was not confined to voiceless stops but that it affected all spirantizable consonants after *-r-*. As such, it may be distinguished from the spirantization in other environments' (Russell, 1985, 56). Put thus, the choice is between either a single process affecting both voiced and voiceless stops after liquids but divorced from spirantisation of voiceless stops after a vowel or else a single spirantisation of voiceless stops that leaves the partially parallel change of voiced stops to voiced fricatives out on a limb, since the lack of this change in Irish makes it impossible to associate it with a much earlier pre-separation lenition of voiced stops between vowel and sonorant.

In terms of overall economy the former approach favoured by Russell has no obvious advantage over the latter analysis broadly advocated by Jackson, Greene and Harvey. A fully integrated second lenition capable of covering both areas would clearly be desirable and in this respect it is surely significant that, since *b, d, g, m* had only been lenited to *v, ð, γ, ṽ* after a vowel, the voiced fricatives had not yet come into existence after a liquid (or nasal) sonorant, whereas after a (sonorant) vowel there was a phonemic opposition between voiced fricatives (from voiced stops by 4.2) and voiced stops (from voiceless stops by the first British lenition). That being so, the second British lenition can simply be stated to have turned a stop into a corresponding fricative after a sonorant c. 600 A.D. wherever the feature [±fricative] had no functional load, i.e. without restriction in the case of a voiceless stop but only after *r* or *l* in the case of a voiced stop, including *m*. A unitary process can thus be posited.

Jackson and Russell seem to assume that *l* plus dental behaved differently but the most convenient way of accounting for alternations of the type MW *athraw* 'tutor' (OC *altrou*; cf. OIr. *altram(m)* 'fosterage'), *kyueillt* 'friend' (< **kom-alt-yo-s*; OIr. *comaltae* 'foster-brother'), pl. *kyueillon* 'friends' is to posit the sequence *lt* > *lθ* in the normal way, loss of *l* before *θr*, intervocalic assimilation of *lθ* > *lh* > *ll* /ɬ/ and finally delenition of the dental where it remained after homorganic *l*, as in Irish (cf. *VKG* I 414; Greene, 1960, 104). The parallelism with the behaviour of nasal plus homorganic stop is striking: e.g., MW *kathyl* 'song' < **kanθl* (OW *kenth(i)liat* 'singer') < **kantlo-* (OIr. *cétal*), *ym penn* /ə mʰen/ 'in the end' (Mod. *ym mhen*) < **ɪ mfeN* < **ɪ mpeN* < **ɪm peN-*, *hanner* 'half' < *hanher* < OW *hanther* < **hanter* < **s/han-tero-*, *cant* 'hundred' < **kanθ* < **kanto-*. The derivations here are in line with Pedersen's conclusion 'that the development ŋk, *nt*, *mp* > ŋx, *nþ*, *mf* is

Common British; *x, þ, f* were undoubtedly also present in word-internal position in Corn. and Bret.; however, in accordance with the law of homorganic delenition to be discussed in a following chapter these fricatives were bound to be changed back to stops after the homorganic nasal; the spirant pronunciation was preserved only when the nasal was lost. This reversion is not, moreover, a specifically Corn.-Bret. phenomenon; W. final *-ŋk, -nt, -mp* as well are not the retained pre-Celtic clusters but have been changed back from *-ŋx, -nθ, -mf*. The difference between internal and final position does not reside in the failure of spirantisation to take place in auslaut but in the development of the spirants a stage further in inlaut than in auslaut. The development was certainly 1) *-ŋx-*, *-ŋx* 2) *-ŋh-*, *-ŋx* 3) *-ŋh-*, *-ŋk* etc.' (*VKG* I 150). Needless to say, the last three sentences refer to Welsh only.

This impressively coherent account has been rejected as 'an extraordinarily complicated theory' by Jackson (*LHEB* 499). While he is quite right to object to Pedersen's gratuitous assertion that a similar spirantisation and reversion occurred in Irish, Jackson's alternative posits general retention of *-mp-, -nt-, -nc-* in British followed by three quite separate developments (*LHEB* 501-2), namely an internal and sandhi development to *m(m)h, n(n)h* and *ŋ(ŋ)h* in Welsh, a post-nasal gemination of initial voiceless stops accompanied by loss of the nasal leading to spirant instead of nasal mutation in Cornish and Breton (*LHEB* 639-41), and direct *ntr/l* to *thr/l* in Welsh. Of this it can only be said that Jackson's view of what constitutes simplicity and economy here is at variance with that of the present writer. Jackson's (*LHEB* 502-3) objection that there is no sign of spellings indicating *nθ, nx* in the meagre pre-seventh-century inscriptional and placename record carries no weight and even his observation (*LHEB* 503-4) that Old Welsh sources of the eighth to eleventh centuries have either *nt, nc* or sometimes *n(n), c(g)* 'except one case of *mph* and three of *nth* which are differently explained below' (*LHEB* 502) is far from conclusive since those same sources often use *p, t, c* to write definitely spirant /f/, /θ/, /x/ (I.4.4). For instance, little can be deduced from spellings such as *pimp* 'five', *cant* 'hundred' in the ninth-century Ox. 1 (*LHEB* 47) when /parθ/ 'part' is only spelt *part* there. Moreover, Ox. 1 *pimphet* is the only example of a reflex of internal *mp* in Old Welsh sources and Jackson's rejection of the possibility that this and Ox. 1 *hanther* 'half' represent actual or erstwhile /pɪmfed/, /hanθer/ respectively is quite arbitrary. It thus seems most likely that the nasals should be added to the list of sonorants responsible for the second British lenition of stops to the corresponding fricatives around the end of the sixth century A.D.

4.6 It follows from 4.1-5 above that the Irish and British lenitions as normally understood are the outcome of three prehistoric phases affecting different classes of consonant between a vowel and a sonorant (or the word boundary): (1) a Proto-Celtic lenition of voiced stops and probably *m* to the

corresponding fricatives, (2) an Insular Celtic lenition of *s* to *h* (and probably a strengthening of *r, l, n* in certain contexts), (3) separate Irish and British lenitions of voiceless stops to the corresponding voiceless fricatives and voiced stops respectively.

The three-tier process envisaged here is no more remarkable than the various stages of lenition obtaining in Spanish. An initial stage entailing postvocalic lenition of voiced stops to voiced fricatives, lenition of voiceless to voiced stops and simplification of geminates in that order or more or less simultaneously had been followed by a further stage involving loss of postvocalic /ð/, /ɣ/ (< Lat. /d/, /g/) and lenition of postvocalic /d/, /g/ (< Lat. /t/, /k/) to /ð/, /ɣ/ either in that order or roughly concurrently by the time of Old Spanish (see Penny, 1991, 65-75): e.g., Lat. *sedere* > **seðer* > Sp. *seer* 'sit', Lat. *catena* > Sp. *cadena* /kaðena/ 'chain', Lat. *gutta* > Sp. *gota* 'drop'. In the case of the labials postvocalic /b/ < /p/ and /v/ < /b/, /v/ remained distinct in Old Spanish and were not merged as /v/ until later (Penny, 1991, 84-6). Allophonic alternation between [b], [d], [g] and [v], [ð], [ɣ] is the only one operating across the word boundary in Modern Spanish. Finally there are more recent dialectal tendencies (particularly in Southern Spain and South America) to weaken final *-s* to *-h* and then often, in pausa or (in E. Andalusia) everywhere, to -Ø (Penny, 1991, 93-5).

The postulation of several chronologically diverse stages of lenition in different varieties of Celtic thus seems quite reasonable typologically and it appears that the morphophonemic mutation known as lenition in both Irish and British is the culmination of three separate prehistoric waves. Although it was a similar process, the second British lenition had a different distribution because it came about after the (morpho)phonemicisation of the first three lenitions and so constitutes a separate spirant (and nasal) mutation synchronically.

As far as the genetic implications of lenition are concerned, that of *b, d, g, m* to *v, ð, ɣ, v̄* has none by virtue of probably being pan- and Proto-Celtic, while that of the voiceless stops is unhelpful because its different effects in Irish and British give no grounds for regarding it as chronologically prior to their separation. On the other hand, Irish and British do agree with each other and apparently disagree with Continental Celtic in their treatment of *s* and quite likely of *l, r, n* with the result that the developments in 4.3 above can be plausibly ascribed to Insular Celtic. As intimated in 4.3, the operation of lenition across the word boundary in close groups is a feature so far only demonstrated for Insular Celtic, although it must be admitted that an *argumentum ex silentio* on this point regarding Continental Celtic is very weak. The (morpho)phonemic status of lenition under similar circumstances in Irish and British is generally held to be based upon relatively late (roughly fifth century A.D.) developments in the separate prehistories of both. However, in the likely event that postvocalic *-s* > *-h* had occurred as early as Insular Celtic,

the possibility arises that Insular Celtic was characterised by alternations similar to those just alluded to in Andalusian and some other varieties of Spanish between retention of /-h/ in contexts such as in pausa or before a vowel and loss before or assimilation to certain following consonants such as nasals, liquids or voiced stops. If so, the fortis/lenis opposition would have acquired morphophonemic relevance as early as Insular Celtic in certain contexts.

5.1. EVIDENCE FOR INSULAR CELTIC. Although, as intimated by Schrijver (4.1), a major part of the positive case for Insular Celtic as a separate genetic node in the development of Irish and British relates to verbal morphology (McCone, 1992, 35-9), there are nevertheless also a number of quite circumstantial phonetic agreements exclusive to the two, particular significance attaching to those which logically constitute a precondition for far-reaching morphological developments apparently unique to the Insular Celtic languages.

5.2 Proto-Indo-European *z* was a mere allophone of *s* before a voiced stop and appears to have undergone no significant change in Continental Celtic. However, it became a voiced dental fricative *ð* in Insular Celtic: e.g., Gaul. *Tasgius*, *-tasgus* etc. but OIr. *Tadg* 'Tadhg' < **Tazgos* (Koch, 1992); OIr. *net* /ned/ 'nest', MW *nyth* < Brit. **nitt-* < **niθt-* (cf. Greene, 1967, 102: 'as in Irish, a cluster containing an unvoiced consonant will be unvoiced') < **niθd-* (presumably an early instance of the juncturał devoicing discussed by Greene, 1967, 103) < IC **niðdos* < IE **nizdos* (Lat. *nīdus*, OE *nest* etc.).

The change *s-* to *h-* at the beginning of a proclitic and subsequent loss of this *h-* before a vowel is so far only securely attested in Irish and British, as indeed is the proclisis of copula, prepositions etc. that must have preceded it: e.g., OIr. *it*, OW *ynt* 'they are' < IC **ɪnti* < PC **sɪnti* < PIE **h₁s-enti*; adj. (stressed) OIr. *samail*, MW *haual* '(a)like' < I/PC **samalis-* (cf. Lat. *similis*) but prep. (unstressed) OIr. *amal*, MW *ual* 'like, as' < IC **avalih* < PC **samali-*. That said, the first word of Gaulish *indas mnas* (Larzac 1ᵇ6-7; *Lam.* 162) would, if cognate with the OIr. nom.-acc. pl. fem. article *inna* < **indās* < **sindās*, display the same loss of *s-* in proclisis (Koch, 1996, 39). Similarly *onda boca* (2ᵃ3 etc.) might contain a proclitic variant of the demonstrative **sondo/ā-* probably underlying non-proclitic OIr. *sund* 'here' (< **sondū*), MW masc. *hwn*, fem. *hon*, pl. *hyn* 'this, these'. However, proclisis of the copula logically depends upon its being placed before its predicate and the generalisation of this position in turn seems best viewed as part of an overall Insular Celtic shift to regular VSO order with clause-initial verb (McCone, forthcoming b). There is thus potentially conflicting evidence regarding the date of *s-* > Ø in proclitics. A possible avenue of escape would be to reconstruct PC **indo/ā-*. An OIr. form like *frissin* 'towards the' would continue **writs-ind-* quite regularly, OIr. *forsin(d)* 'on the' must anyway be analogical as **forrin(d)* should

have resulted from **wor-sind-*, and OIr. *issin(d)* 'in(to) the' could have been triggered from *i* by a relationship such as that between *fri* and *frissin* any time after the loss of final *-n* and *-h* (IV.4.2). Some hibridization between **indo/ā-* and **sondo/ā-* may also have occurred.

The assimilation of dental plus *s* to *ss* apparently goes back as far as Insular Celtic (but no further; II.2.2): e.g., OIr. *ís*, MW *is* 'under' < IC **ɪssu* < PC **īt-su* < **pēd-su* 'at the feet' (< PIE loc. pl. **ped-su* with lengthening spreading from nom. sg. **pōs*? Cf. αδες · πόδες 'feet' at Hesychius A 1067 arguably reflecting a Galatian *vel sim.* nom. pl. *ādes* < **pōd-es* for PIE **pod-es* as a result of similar analogical lengthening?).

Loss of *s* between *r/l/x* and another consonant must have preceded the assimilation of *st* > *ss* found in both Irish and British but probably not in Gaulish and certainly not in Celtiberian (Schrijver, 1995, 402-3): e.g., OIr. *arc-u*, MW *arch-af* 'I ask' <**ark-* < **arsk-* (II.3.2) or OIr. *tart* 'thirst' < **tartus* < **tars-tu-* < PIE **tr̥s-t-* (OE *þurst*, Skt. *tr̥ṣ ṭa-* etc.); OIr. *carais*, MW *caras* 'loved' < **karass-* < **karast(-)*; OIr. *glas*, MW *glas* 'green, blue, grey' < IC **glasso/ā-* < PC **glasto/ā-* (Gallo-Lat. *glastum* 'woad'); OIr. *foss*, MW *gwas* 'servant' < **wosso-* < **wo-sto-* (but Gallo-Lat. *-uassus* too in this case) < IE **upo-sth₂-o-* 'standing under/by'. Apparent British exceptions such as OW *clust* = OIr. *clúas* 'cluas' < IC **klōs-(s)tā* < **klows-(s)tā* or OC *Un-gust*, OB *Uur-gust* = OIr. *Óen-gus*, *Fer-gus* < IC **-gus-(s)tus* < (cf. Lat. *gustus* 'taste' etc.) have been dealt with by Schrijver (1995, 406-15), who ascribes Brit. *-ss-* and *-st-* (Ir. *-ss-* throughout) to IC *-st-* and *-sst-* respectively. If so, only *-st(-)* was assimilated to *-ss(-)* in Insular Celtic and *-sst(-)* became *-st(-)*, which was retained in British and only assimilated to *-ss(-)* in the separate prehistory of Irish. Change of proclitic *es(s)* to *is(s)* some time after this might be the reason for OIr. *is*, MW *ys* 'is' < **issi(-)* < **essi(-)* < **esti* but the Welsh form would also derive straightforwardly from **essi(-)* and its Irish counterpart might rather owe its *i* to analogy (McCone, 1995, 126 and 130-1).

The fact that assimilation of V*st* to V*ss* almost certainly occurred no further back than Insular Celtic is of crucial importance because, as has been conclusively demonstrated by Watkins (1962, 174-80), this development was a necessary prerequisite for the establishment of an *s*-preterite with a morpheme *-ss-* throughout that is so far unattested outside Insular Celtic and was spread from a 3sg. -V-*ss* (< -V-*s-t*) by reanalysis of this as -V-*ss*-Ø or stem plus zero ending. Corresponding generation of a *t*-preterite from 3sg. -R-*t*-Ø (< -R-*s-t*; Watkins, 1962, 156-74) is thus also likely to be an Insular Celtic phenomenon, although the essential phonetic basis of loss of *s* between certain consonants cannot as yet be proved to have been confined to Irish and British.

5.3 Positing a change of unstressed *e* to *i* before *-s-* plus vowel neatly accounts for a number of otherwise problematical forms: e.g., OIr. 2sg. abs./

conj. *biri*, *-bir* 'you carry' < **birihi*, **birih* < IC **berisi-*, **beris* < **berisi* < PIE **bʰer-e-si*; 2sg. abs. *it* 'you are' < (pronominal *-t* +) **i* < **ihi* < **isi-* < **isi* < **e-si*; 2pl. abs. *adi* 'you are' < **etihi* < **e-tisi* < **e-tesi*; *s*-stem dat. sg. *nim* 'heaven' < **niṽ-ih* < **neṽ-is* < **nem-is-i* < loc. sg. **-es-i*, nom.-acc. pl. *nime* 'heavens' < **niṽ´eya* < **niṽiya* < **neṽiha* < **neṽisa* < **nemesa* and similarly MW *tei* 'houses' < **teγi* < **teγiha* < **teγisa* < **tegesa* (cf. Schrijver, 1995, 390-3). Since only stressed *e* was liable to Primitive Irish raising before *i* in the following syllable by IV.2.1(a), the 2sg. of the proclitic copula, which has been discussed in detail elsewhere (McCone, 1995, 123-6) is important because it shows that this earlier change to *i* before *s* affected unstressed rather than merely non-initial *e*. Although *e* had become *i* in hiatus before a back vowel in Primitive Irish (IV.1.4), British *chwaer* 'sister' < **hweīr* < **swesūr* disproves stressed *es*V > *is*V in Insular Celtic (II.2.1). OIr. *indé* 'yesterday', consisting of the article plus stressed *dé* < **des* < **gdes* < **gʰðes* (Gk. χθές), could owe its retained *e* either to the stress or to the lack of an immediately following vowel, the latter factor being responsible for cases like OIr. *ad-ro:soid* 'stopped' < **sod-ess* (< **-e-s-t*), *coin* 'dogs' < **kon-es* (IV.2.6) rather than the **-suid*, **cuin* with raising of stressed *o* to *u* (IV.2.1b) that should have resulted from **-sodiss*, **konis*.

If *es* to *is* occurred only when the vowel was unstressed and the *s* was followed directly by another vowel, it will not only have antedated the Insular Celtic apocope of *-i* first posited by Cowgill (1975) but also seems to imply that Insular Celtic had essentially the same type of initial demarcative word stress as Old Irish, a position advocated by Schrijver (1995, 17-20) and others on the strength of different considerations. In that case the change in British to an accentual pattern defined in relation to the end of the word would be no more surprising than a similar shift away from earlier word-initial stress in Latin (Palmer, 1954, 211-3).

5.4 In the wake of Cowgill's (1975) celebrated article it is now more or less generally agreed that OIr. present conjunct forms such as 3sg. *-beir*, 3pl. *-berat* < **beret*, **beront* ultimately derive by means of an early apocope of **-i* from **bereti*, **beronti* with primary endings of the normal type inherited from PIE. Since there are survivals of the absolute/conjunct dichotomy in early Welsh poetry (*GMW* 119), there can be no doubt that the apocope of **-i* that triggered it is at least as old as Insular Celtic, as Cowgill saw. Even if, as seems quite likely, apocope of *-i* is found after *t* at least in Celtiberian, orthographical considerations make it extremely probable that this development was a very recent one postdating the introduction of the Iberian script, as argued in I.3.5, and it is possible that Latin influence played a role. That being so, this process can hardly be connected with the Insular Celtic apocope of **-i* and this pretty much excludes a Proto-Celtic date for loss of **-i*, whether

general or restricted. If, as argued elsewhere (McCone, 1978), Old Irish consonant-stem short datives of the type *oíntu* 'unity' are to be derived from **oinoθūθ* < **oinotūt* < (old loc.) **oinotūti* by general early apocope of **-i*, then consonant-stem (*Lam.* 61) dat. (old loc.) μαγουρειγι (*RIG* G-121), ατεμαγουτι (G-122), EPAÐATEXTORIGI (L-6) conclusively demonstrate the absence of this development in Gaulish and 1sg. *uediiumi*, *pissiumi* (both Chamalières), ιμμι (G-13; *Lam.* 62) offer further support. There can thus be little doubt that this apocope of *-i* and the highly circumstantial absolute/conjunct inflectional dichotomy triggered by it were both confined to Insular Celtic as Cowgill suspected.

Whereas Cowgill (1975) maintained that Insular Celtic loss of *-i* sometimes did and sometimes did not occur under still obscure circumstances reminiscent of Italic, the present writer went on to argue (McCone, 1978) that the methodologically preferable postulate of a general apocope of *-i* was fully in accord with the available facts, the only serious obstacle being *inn-uraid* 'last year' allegedly from unapocopated **eruti* cognate with Gk. πέρυσι. This difficulty disappeared with the realisation (McCone, 1992, 36, n. 108) that the form *inn-* of the article in the earliest attestation (Wb. 16c14) strongly indicated an origin as an acc. **eruten* or rather **aruten* (with **ar(e)* plus acc. for petrified *er* plus loc./dat.; cf. IV.2.3 and V.5.4) analogically generated from inherited dat. **erut(i)* in accordance with the normal dental-stem pattern.

The neat blanket apocope of *-i* thus deduced has recently been questioned by Schrijver (1994, 159-65), who proposes to restrict its operation to position after a voiceless stop. The fulcrum is provided by his derivation by means of a postulate of *-t* > *-s*, of OIr. *fri* 'against', *la* 'with' < **wris*, **les* < **writ*, **let* < **writi*, **leti* but this is vitiated by its failure to account for a single form with suffixed pronoun straightforwardly apart from the isolated and allegedly archaic 3pl. *lethu* 'with them' in the Book of Armagh (Schrijver, 1994, 169). In view, however, of the regular occurrence of *leu* in the Glosses, this seems more likely to be a solitary early example of the spread of 3pl. *-thu* well attested in Middle and Modern Irish. This virtually hundred-percent failure rate tips the scales firmly in favour of the appreciably more efficacious preforms **writ(s)*, **let(s)* proposed by Russell (1988, 118-23; note that byeforms without *s* could have been extrapolated from cases where *s* was lost regularly before certain consonants).

As far as short consonant-stem datives are concerned, Schrijver's view entails accepting the explanation of *inn-uraid* just offered as well as the derivation of *oíntu* etc. above from an apocopated **-i* locative but deriving the *s*-stem type *t(a)ig* from an unapocopated **tegesi* by means of an *ad hoc* postulate of intervening **teg-ei* > **teg-ī* (as opposed to the possibility of **gdesi* > **des* 'yesterday' envisaged by Schrijver, 1995, 390) and tracing the *n*-stem

dat. type *toimte* 'opinion' back to an archaic endingless locative **to$\breve{v}$ediyon* alleged to have coexisted for several millennia with an elsewhere productive *i*-locative held to underlie an OIr. *n*-stem long dat. like *toimtin* from unapocopated **to$\breve{v}$ediyoni*. This explanation is too uneconomical to be accepted in the absence of stronger arguments than those actually adduced. Indeed, the endingless locative looks like a good candidate for Schrijver's own dictum that, 'although the incidental survival of isolated archaisms certainly cannot be ruled out, one must be careful, not to say reluctant, in positing them, and first explore different possibilities' (1995, 450). More to the point, in the unlikely event that both *toimte* (13 exx. of this type in Wb.) and *toimtin* (9 exx.) were redundant variants inherited right from PIE, the creation of yet a third dat. sg. *toimtiu* (9 exx.) identical with the nom. sg. on the model of dental-stem nom./dat. sg. *oíntu* etc. in early Old Irish would be quite extraordinary just when *toimtin* and the new dat. type *oíntaid* barely attested in Wb. were about to take off as the overwhelmingly preponderant dat. sg. forms in Ml., where there is a solitary example of the *toimtiu* type, a mere seven of the *toimte* type and no less than sixty two of the *toimtin* type (McCone, 1978, 26-7). If, on the other hand, the only inherited dat. sg. was *toimte* from apocopated **to$\breve{v}$ediyon* < **-oni*, analogical creation of a dat. *toimtiu* identical with the nom. would be quite natural before the acc. sg. *toimtin* was pressed into service as a rapidly expanding new dat.

There can, then, be little doubt that apocope of **-i* occurred across the board in Insular Celtic and cannot be projected back to Proto-Celtic. If, as seems virtually certain, this development was a *sine qua non* for the highly circumstantial creation of separate absolute and conjunct verbal inflections shared by Irish and British, we are left with a very powerful argument for Insular Celtic as a separate genetic node.

5.5 There is, of course, an ongoing debate about precisely how the absolute endings were differentiated from the mostly apocopated conjunct set but this is not the place for detailed discussion of this question, which has been aired at length elsewhere (e.g., Cowgill, 1975; McCone, forthcoming b). Suffice it to say that, whereas making the shielding of *-i* from apocope by a following enclitic the basic trigger for a new absolute set (McCone, 1979, 1982 and 1985b) has no further phonological ramifications, alternatives (most recently Schrijver, 1994, 180-7) involving generalisation of an alleged enclitic particle **es* (< **et* < **eti* according to Schrijver) or the like not only add a number of otherwise quite unnecessary phonological rules but also call for quite arbitrary assumptions about exactly when various combinations involving this phantom element came into being. Even so they are still beset by serious internal inconsistencies (e.g. Schrijver, 1994, 169; McCone, 1979, 4-10; 1985b, 223-4 and 269-70). It may be noted that the derivation by Cowgill and others of the 2pl. abs. type *beirthe* 'you bear' from **bereθēh* < **beretes-es*, which necessitates rejection of unstressed *es* > *is* in 5.3 before a front vowel at least (Schrijver, 1995, 387-8), is simply disproved by 2pl. copula *adi* 'you are' < **eθih-* < **etes-* (5.3), which undoubtedly retains the original 2pl. abs. ending (McCone, 1995, 124-6) and must have undergone *es* > *is* regardless of whether what followed was primary *-i* or an alleged particle **es*. On the whole, the effects of any fully elaborated version of the particle theory upon the historical phonology of Insular Celtic and Primitive Irish are rather like those of certain types of computer virus upon a hitherto smoothly running programme. Occam's razor provides the necessary surgery and the putative particle will have no place in what follows.

5.6 Loss of *w* after an initial dental is attested in both Irish and British: e.g., OIr. *dorus* 'door', OB *dor*, OC *darat* < **dwor(-)* vs. Gaul. *Dvorico* < IE **dʰwor(-)* (Skt. *dvar-*, Gk. *θύρα*, OE *dor*). The same development also occurs at the beginning of an internal syllable (/ = syllable boundary): e.g., OIr. *art* 'stone' < IC **artā* < PC **ar/twā* (Gaul. *artuas* 'stones'; cf. Lat. *artus* 'limb'; PIE **h$_2$er-* 'fix'), OIr. *ard* 'high', MW *ard* < IC **ardos* < PC **ar/dwos* (Gaul. *Arduenna*; cf. Lat. *arduus*) vs. OIr. *fedb* 'widow', MW *gwedw* < CC **wid/wā* (cf. Lat. *vidua*, OE *widow*). As can be seen from the relevant examples, this was clearly not a Gaulish phenomenon and so cannot be projected any further back than Insular Celtic.

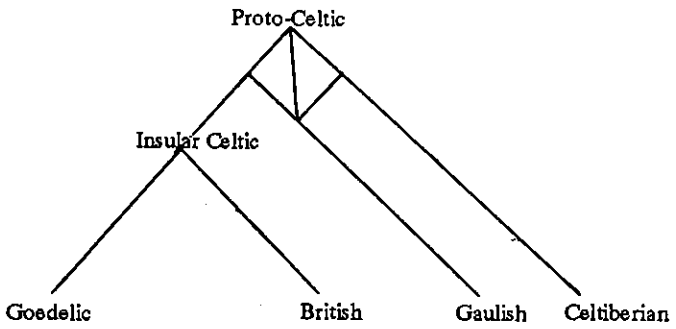
5.7 The elision of *o* in hiatus before another vowel in the same word might be ascribed to Insular Celtic on the strength of examples such as OIr. *-ric* 'reaches', W *rhyng-u* < **r(o)-ink-*, OIr. *comrac* 'encounter', MW *kyfranc* < **kom-r(o)-ank-o-*.

Final *-oi* was probably monophthongised to *-ī* in the prehistory of British as well as Irish and this can then be considered an Insular Celtic change: e.g., OIr. *baird*, MW *beird* 'bards' < **bardī* < **bardoi* (Gaul. *-oi*; II.5.4). If so, it is most conveniently formulated as *-oi/-āi* > *-ai* > *-ī* on the assumption that the *a* < *o* in final syllables seen on Ogam inscriptions took place in Insular Celtic (IV.1.4). This development did not, of course, apply to Continental Celtic, which offers plentiful instances of *-os*, *-om* or *-on*.

Whereas the system of short vowels inherited from Proto-Celtic (II.5.1) would seem to have undergone no significant change in Insular Celtic, a gap in the system of long vowels (II.5.5) was filled by the monophthongisation of *ow* > *ō*. Since this occurred in the prehistory of both Irish and British but not in Celtiberian or (apart from sporadic later instances) Gaulish, it may well be an Insular Celtic development (McCone, 1992, 19): e.g., OIr. *slúag*, *slóg* 'host', MW *llu* (VI.2.1a) < **slōgos* < **slowgos*. Whatever the date of this process, which is sufficiently natural to have come about independently in the two branches, it resulted in the following symmetrical system matching that of the corresponding short vowel phonemes (II.5.1):

ī ū
ē ō
ā

5.8 Considerations such as the foregoing make a common intervening Insular Celtic stage in the development of Irish and British highly probable and the Gallo-British alternative a good deal less likely. On present evidence the precise position of Gaulish cannot be determined with confidence. It might share a special Continental Celtic node with Celtiberian, a separate pre-Insular node with Insular Celtic or perhaps constitute a distinct third branch. Allowance is made for all three possibilities in the diagram below summarising the findings of this chapter.



CHAPTER FOUR

Primitive Irish

1.1 EARLY DEVELOPMENTS. The following are typical examples of the loss or truncation of final syllables in Irish (and independently British) as compared with Gaulish or Celtiberian: OIr. *máthair* 'mother' = Gaul. *matir*; OIr. *fer* 'man' (MW *gwr*) = Celtib. UIROS; OIr. *fine* 'descendants' (MB *gouen*) = Gaul. UENIA (McCone, 1993); OIr. *gaib* 'take!' = Gaul. *gabi*; OIr. *-riug* 'I direct' = Gaul. *regu*; OIr. *oll* 'much' = Gaul. *ollon*; OIr. *búaid* 'victory' (MW *bud*) = Gaul. *boudi* (McCone, 1996, 110 and 113); OIr. *mná* 'women' = Gaul. *mnas*; OIr. *rí* 'king', dat. sg. *ríg* = Gaul. *-rix*, dat. sg. *-rigi*; OIr. *sechtmad* 'seventh' (MW *seithvet*) = Gaul. *sextametos*; OIr. *dechmad* 'tenth' (MW *degvet*) = Gaul. *decametos* (nom. sg. m.), Celtib. **tekametam** (acc. sg. f.); OIr. *cét* 'hundred' (MW *cant*) = Celtib. **kantom**. Containing as they do examples of retained as well as of lost or truncated final syllables, Ogam inscriptions indicate a date in the fifth and sixth centuries for a number of cataclysmic changes responsible for the transformation of Irish from a basically old Celtic typology inherited from Proto-Indo-European to a rather different system in which the modification of initial and final consonants as well as of internal syllables played a key morphological role as they have continued to do ever since: e.g., Og. MAQI (or MAQ, MAC) = OIr. *maic* /mak´/ (gen. sg. of *mac* 'son'), Og. INIGENA = OIr. *ingen* 'daughter', Og. DEGOS (or DEGO) = OIr. *Dego* (gen. sg. of *Daig*), Og. COMMAGGAGNI (or COMOGANN) = OIr. *Comgá(i)n* /koṽɣān(ʲ)/ (gen. sg. of *Comgán*). The details must now be examined.

1.2 An essential precursor of these developments appears to have been the lenition of a single postvocalic voiceless stop (III.4.4) to the corresponding fricative and then the weakening of a final fricative or *-s* to *-h*, whence PC **wiros* > PrimIr. **wirah* (> OIr. *fer* 'man') or PC **bereti* > IC **beret* (III.5.4) > PrimIr. **bereθ* > **bereh* (> OIr. *-beir* 'bears'). This weakening must have been preceded by the assimilation of any remaining *-(s)st(-)* (III.5.2; e.g. IC **klōs(s)tā* > PrimIr. **klō(s)sā* > OIr. *clúas* 'ear') and of *-xs(-)* to *-ss(-)* (> *-s* in auslaut?) in order to account for PIE **sweḱs* > IC **swexs* (MW *chwech*) > PrimIr. **swe(s)s* > **sweh* > OIr. *sé* 'six' or PC **rīx-s* > PrimIr. **rī(s)s* > **rīh* > OIr. *rí* 'king'.

It must also have been preceded by early syncope of a short vowel between two dental fricatives, two *s*'s or two *r*'s in a final syllable, if the previous syllable was unstressed too (McCone, 1981, 35-41). Thus OIr. *reithid, -reith* 'runs' < **Reθeθi, *-Reθeθ* (stressed **Reθ-*) vs. *do:im-thi-ret* 'serves' <

**to amb'-aθe-reθθ* < **-reθeθ* (unstressed **reθ-*), OIr. *guidid*, *-guid* 'beseeches' < **g^{w}eðiθi*, **-g^{w}eðiθ* (stressed **g^{w}eð-*) vs. *ar:ne-get* 'prays' < **are ne-γ^{w}eðθ* < **-γ^{w}eðiθ* (unstressed **g^{w}eð-*) or OIr. *do:berar* 'is given' < **to beror* (stressed **ber-*) vs. *ní:tabarr* 'is not given' < **-taveʀ* < **-toverr* < **-to-veror* (unstressed **ber-*). If one fricative was voiceless, the other was devoiced as well and the whole group was then delenited to *t(t)*, as in **are ne-γ^{w}eðθ* > **are ne-γ^{w}eθθ* > **are ne-γ^{w}et(t)* > OIr. *ar:ne-get*.

The obvious explanation for the failure of a palatal consonant group to result from the lost front vowel by this (*-θe/iθ* > *-θθ* > non-pal. *-t*) as opposed to the main syncope (3.5, 5.3 and V.1.5) is that it predated the first palatalisation (3.2). This lack of palatalisation militates against Schrijver's (1992, 183) contention that a form like the verbal noun *cosaít* 'complaining' of *con:saídi* 'complains' might be ascribed to this same process by removing the restriction to final syllables prior to the main apocope in 4.3, whence **kosoiðiθu(h)* > **kosoiðθu(h)* > **kosoitu(h)* (cf. MW *ky-hud-* 'accuse' with *LEIA* C-199?). In that case the outcome would surely have been OIr. *cosaít*, gen. **cosaíto* with a non-palatal instead of the palatal *-t(-)* clearly attested by Ml. 127^{c}1 *trim chosaít-se* (not *-sa*) 'through complaining of me', to say nothing of invariable ModIr. *casaoid*. This difficulty can only be resolved by placing the development of this and a number of similar forms discussed elsewhere (McCone, 1981, 40-1) close to the main syncope (V.1.4).

1.3 Low back *a* would seem to have become low front *æ* before a nasal plus obstruent, a double or a final nasal by Primitive Irish at latest but very probably as early as Proto-Celtic (II.5.1), *ænn* (or *-æn#*) then becoming *enn* (or *-en#*) in Primitive Irish. Thus *ans/x* > *æns/x*, *ant/k* > *ænt/k*, *amb* > *æmb*, *and/g* > *ænd/g* and *ann*, *-am/n* > *ænn*, *-æm/n* > *enn*, *-en* exemplified by PC **bandnā* > **bænnā* (MW *bann*) > PrimIr. **bennā* > OIr. *benn* 'peak' and PC **tewtām* > **towtam* > IC **tōtæn* > PrimIr. **tōθen* > OIr. acc. sg. *túaith* /tuaθʹ/ 'kingdom'.

The next stage was loss of a nasal before a voiceless consonant, a process accompanied by compensatory lengthening in the case of a continuant: e.g., PIE **ǵ^{h}ans-* (> Skr. *haṁs-*, OE. *gōs* etc.) > PC **gans-is* > PrimIr. **gænsih* > **gɛ̄sih* > **gɛ̄sʹ* > OIr. *géis* 'goose, swan'; **weydonts* 'telling, ordering' (OIr. *ad:fét* 'tells, relates') > PC **wēdons* > PrimIr. **wēdōs* > OIr. *flaith* 'lord'; **karants* 'loving' > (after PC *-ans* > *-ās* in II.2.4a) **karans* > **karæns* > **karɛ̄s* > OIr. *car(a)e* 'friend'; **tinxtiyū* > **tixtiyū* > OIr. *tíchtu* 'coming' (vb. n. of *do:ic*); **ŋk-tu-* > PC **anx-tu-* > PrimIr. **ænx-tu-* > **ɛx-tu-* > OIr. *écht* 'slaughter'. In the case of a stop, voicing ensued but the different outcome seen, for example, in OIr *cét* /kēd/ 'hundred' < **kændan* < **kæntan* (MW *cant*) < **kantom* and OIr. *ind-* 'in(to)' < **ænde* (Gaul. *ande-*) < **ande* would defy explanation unless there was some difference between the nasal element before the voiced stop and that before the voiceless one at the penultimate stage of these two derivations and others like them.

Three different approaches to this problem have already been discussed (III.4.4), the simplest being Greene's view that the nasal before a voiceless stop was lenis /n/ whereas that before a voiced stop was fortis /N/, the way thus being opened for **kæntan* > **kændan* > **kɛ̄dan* vs. unchanged **æNde*. Thurneysen's alternative (followed by McCone, *SnaG*, 77-8) that a vowel plus single nasal was converted into a nasal vowel before a voiceless stop, whence **kæntan* > **kæ̃tan* > **kæ̃dan* > **kɛ̄dan*, in effect offers a different formulation of the contrast between a weaker and a stronger nasal before a voiceless and a voiced stop respectively. Its disadvantage is that both compensatory lengthening of a preceding vowel and voicing of a following consonant are perhaps more readily explained in terms of a nasal consonant than a mere nasalised vowel. The most straightforward approach seems to be to posit (a) voicing of a voiceless stop after /n/ (**kæntan* > **kændan*, **tonketah* > **tongetah*), (b) uncompensated loss of /n/ before a stop except after stressed [æ] and [ɪ] (**tongetah* (MW *tynghet*) > **togetah* > **togeθa* > OIr. *tocad* 'fortune') and (c) compensated loss of /n/ between [æ] or [ɪ] (both > /ɛ̄/) and a stop (**kændan* > **kɛ̄dan*; OIr. *cét* 'hundred'). Although the possibility can hardly be ruled out, this scenario obviates the need to join Schrijver (1993, 33-5) in positing nasalisation of any preceding vowel before loss of /n/. However, it seems tempting to posit nasalisation of [æ] and [ɪ] to [ɛ̃] before a nasal in order to explain the peculiar reflex in (c) as **kændan* > **kɛ̃ndan* > **kɛ̃dan*. Further examples include PIE **n̥-* 'un-' (> Gk. *α-*, Lat. *in-*, OE *un-*) > PC *an-* (Gaul. *an-*, MW *an-*) > OIr. *é-* before *t*, *c* as in *é-cóir* /ēgōrʹ/ 'unjust' < PC **æn-kowar-i-/-yo-* (MW *ag-kyweir*); PIE **h$_2$weh$_1$ntos* (> Lat. *ventus*, OE *wind* etc.) > PC **wēnto/ā-* > **wĩnto/ā-* > **winto/ā-* (II.5.5; > MW *gwynt* 'wind') > PrimIr. **windā* > **widā* > **weda* (2.1a/c) > OIr. *fet* /fed/ 'whistle' (McCone, 1991b, 49-51); PIE **sent-* (> Got. *sinþs*) > PC **sɪnt-us* (> MW *hynt*) > PrimIr. **sɪnduh* > **sɛ̃du* > OIr. *sét* /sēd/ 'path, way'. In the uncertain event that Schrijver (1993, 41) is right to compare Toch. A *ṣont* 'road' and, tentatively, Skt. *sātu-* 'vagina' with their implication of a preform **seh$_1$ntu-* > **sēntu-* > PC **sĩntu-* > **sintu-* > MW *hynt*, OIr. *sét*, then the explanation just proposed for OIr. *fet* 'whistle' would have to be abandoned.

There is no evidence for compensatory lengthening of unstressed [æ]/[ɪ] before nasal plus stop, which may imply retention of the nasal until stage (c) above only when the preceding mid to low front vowel was stressed, perhaps because nasalisation of the vowel was confined to this environment. Hence such proclitic forms as 3pl. copula *it* < **ɪdi* < **ɪnti*, prep. *itar* 'between' < **ɪder* < **ɪnter* (OW *ithr*, C *enter*). There are also a few problematical instances with

unlengthened stressed vowel (*GOI* 518-9) such as *ecor* 'arrangement' < **ɪnkorah* (vb. n. of *in:cuirethar*; ModIr. *eagar*), *tecosc* 'instruction' < **t(o)-ɪn-ko(m)-skʷ-an*, *do:ecmaing* 'befalls' < **to ɪn-koṽ-ɪnkeh* (ModIr. *teagmh-*), *do:ecmalla* 'collects' < **to ɪn-koṽ-eʟāh* or the stressed pronominal forms of *itar*, e.g. *etronn*, *etruib*, *etarru* 'between us/you/them' < **edro-ɴah/-hweh/-hūh* < **ɪdro-* < **ɪntro-* (with preconsonantal liaison vowel as in dat. pl. *rɪgaib* < **rɪ̄gobis* for **rɪ̄g-bis* etc.?). Conceivably the following *o* (plus *r* or *m/ṽ*?) played a role in loss of the nasal at stage (b) rather than stage (c) but the precise conditioning remains unclear.

There is evidence that the development *nt/k*$^{(w)}$ > *d/g*$^{(w)}$ had been completed before the fifth century A.D. To begin with, Ogam inscriptions present two examples of a voiced stop in place of *n* plus voiceless stop, namely DECCEDDAS /dexēdah/ < gen. sg. **dekant-os* (cf. Gaul. δεκαντ-) and TOGITTAC /togʹɪθaxʹ/ = OIr. gen. sg. *Toicthig* (nom. *Toicthech* 'Lucky') < **Tonketākī* (McManus, 1991, 84) and so far none of NT, NC or the like. Secondly, had Latin words such as *planta* (> MW *plant* 'children'), *ancora* been borrowed before this loss of nasality with concomitant voicing, OIr. **clét*, **écor* or the like should have resulted and not the actually attested *cland* 'family', *ingor* 'anchor'. The only plausible reason for substitution of PrimIr. *nd, ng* for Lat. *nt, nc* would seem to be the lack of native *nt, nc* in fifth-century Irish because these had already become *d, g* respectively (McManus, 1983, 60-1).

Voicing of *t, k* to *d, g* after a nasal occurred not only within the word but also across the word boundary in the case of syntactically close groups (cf. lenition in III.4.2-4). This ultimately gave rise to grammatical nasalisation as in PC gen. pl. **sindoisom karantom* > PrimIr. **indoyhan karantan* > **indoya gareda(n)* > **indoy gared* > (V.2.3) **indē gared* > OIr. *inna carat* /ɪ̃na garəd/ (ModIr. *na gcarad*) 'of the friends'.

Alternations of the type *con:ic* 'is able' vs. prot. *-cumaing* (3pl. *-cumcat* with post-syncope loss of ŋ between ṽ and *g*), vb. n. *cumang*, *do:ecmaing* 'befalls', 3p. *do:ecmungat* are only explicable on the assumption that in an unstressed sequence ṽVŋ*k* the nasal had its usual voicing effect to produce ṽVŋ*g* but was not lost in the normal way thereafter, probably because it was strengthened to /ŋ/ under the influence of preceding /ṽ/ separated from it only by an unstressed vowel (note the normal development seen when *r* also intervenes in *con:ric* 'meets', prot. *-comraic*, vb. n. *comrac*). Schrijver (1993, 35-46) has argued that, whereas *int/k* (including < *ɪ̄nt/k*, but see II.5.7) like *ænt/k* became *ɛ̄d/g*, *ænnt/k* became first *ennt/k* (cf. *ænn* > *enn* above) and was then simplified to *ent/k*, after which an *ad hoc* Primitive Irish development > *int/k* > *id/g* is invoked to justify a derivation of *-ic* < **en(n)keh* < **ænnket(i)* < **annk-* < **ŋnk-* < **$h_{2/3}$ŋ-n-ḱ-*. The obvious objection is that, if *ennk* was simplified to *enk* early enough, it would surely have shared in the development to *ɛ̄g* undergone by *ænk*, *ɪnk* and quite likely seen in OIr. *-téici* 'congeals' < **tænk-* < **tænnk-* < **tannk-* < **tŋ-n-k-* if directly comparable with the Skt. nasal present *tanakti* 'coagulates' (McCone, 1991b, 48). On the other hand, retention of the nasal past this stage would presumably have resulted in the *ing* sequence seen in *-cumaing* etc. In short, this derivation should have produced **-éic* or **-ing* but hardly *-ic*.

1.4 Ogam forms prove that *o* became *a* in final unstressed syllables in the prehistory of Irish: e.g., gen. pl. MAQA 'of (the) sons' < **-an* < (Gaul. *-on* <) PC **-om* < **-ōm* (III.5.1), gen. sg. NIOTTA 'of the sister's son' < **nioθah* < PC **ne(p)ot-os* (McManus, 1991, 84-5). If *-oi* had not already been monophthongised to *-ɪ* in Insular Celtic, it would presumably have become *-ai* as a result of this development and then undergone the Primitive Irish monophthongisation of *-ai* to *-ɪ* proved by examples like OIr. dat. sg. *tuil* < **tul-i* < **tol-i* < **tol-ɪ* < **-ai* < **-āy* (II.5.6 ; nom. *tol* 'will' < *tol-ā*). Thus, in the admittedly unlikely event that an *i*-affected MW nom. pl. like *beird* 'bards' is from **bard-ɪs* < IC **-ūs* rather than from IC **bard-ɪ* < **-oi* (II.5.3), nothing prevents derivation of an OIr. *o*-stem nom. pl. like *fir* from PrimIr. < **wir-i* < **wir-ɪ* < **-ai* < IC **-oi*. Since, however, there is nothing as yet to prevent the ascription of unstressed *o* > *a* in final syllables to Insular Celtic, this stage may already have witnessed both **-oi*, **-āi* > **-ai* and the further monophthongisation of both to **-ɪ* (III.5.7). Og. NIOTTA (OIr. *niad*) < IC **neotos* < **nepotos* also attests to a Primitive Irish change *e* to *i(y)* in hiatus before a back vowel not seen in MW *nei* < **neīs* < I/PC **neūs* < **nepōs* (Lat. *nepos* etc.).

1.5 A further crucial Primitive Irish development prior to 2.1(c) below at least was the probably regular insertion of *i* between consonant and *y* (Cullen, 1972): e.g., OIr. *aile* < PrimIr. **alʹeyah* < **aliyah* < I/PC **alyos* (MW *eil*, Gaul. *allos*, Celtib. acc. sg. **ailam**) < IE **alyos* or **$h_2$elyos* (> Gk. ἄλλος, Lat. *alius*).

2.1 UMLAUT AND OTHER CHANGES IN VOCALISM. Whether it had come into being as early as Insular Celtic (III.5.3) or not, the initial word stress characteristic of Old Irish must have been in force by the time (a) below took place. The only exceptions to this general pattern are a few late juxtapositions of the type *in-nocht* 'tonight', *inn-uraid* 'last year' (article plus stressed *nocht* and *uraid*; III.5.4) and, more importantly, the so-called 'deuterotonic' forms of compound verbs with proclitic first preverb as opposed to the so-called 'prototonic' forms with stressed first preverb that chiefly occur after certain proclitic particles such as the negative (see *GOI* 27-31 and *EIV* 1-8): e.g., deut. *for:beir* 'increases', *for:con-gair* 'commands' (stress on *-beir*, *-con-*) vs. *nɪ́:for-bair* 'does not give', *nɪ́:for*$^{\text{t}}$*ngair* 'does not command' with prot.

forms (both stressed on *-for-*). In this case the first element (**wor* in the first two examples, the negative in the last two) was probably once separated from the rest of the verbal expression in tmesis with the result that both halves were stressed. However, once these had been 'univerbated' into a single group at the head of the sentence, the lighter stressed element (**wor*, neg. respectively) became proclitic to the heavier one following it by the process in III.5.2 (see Watkins, 1963, and McCone, 1979, for full discussions).

That brings us to three crucial Primitive Irish developments illustrated by OIr. *cucann* 'kitchen' (assimilated as a fem. *ā*-stem with nom. sg. **kogīnā*) < Lat. *coquīna* /kogīna/ (> MW *kegin*) and *pridchid* 'preaches' (assimilated as a weak *ā*-verb with 3sg. conj. **-preðixāh*) < *praedicat* /preðikat/ below.

(a) Shortening of unstressed long vowels except before *-h*, whence unchanged **-preðixāh* but **kogīnā* > **kogina*, **tol-ī* > *tol-i*, **wir-ī* > **wir-i* in 1.4, (PIE **mātēr* > P/IC **mātīr* >) **māθīr* > **māθir* (OIr. *máth(a)ir*).

(b) Raising of stressed short *e, o* (i.e. in initial syllables) to *i, u* respectively before a high vowel (*i/ī* or *u/ū*), whence **kogina* > **kugina*, **-preðixāh* > **-priðixāh*, **tol-i* > **tul-i*.

(c) Lowering of short stressed or unstressed *i, u* to *e, o* before a non-high back vowel (*a/ā* or *o/ō*) in the following syllable, whence **kugina* > **kugena*, **-priðixāh* > **-priðˊexāh* or **aliyah* > **alˊeyah* in 1.5.

As one might expect, some Ogam forms with (b) or (c) and some with neither are attested: e.g., gen. sg. -CUNAS (< PC **kunos*), -CONAS and -CONA and finally -CON = OIr. *con* (McManus, 1991, 102; OIr. nom. sg. *cú* 'hound'). The lost final syllable often left its mark in the form of a vocalic alternation in an Old Irish paradigm: e.g., OIr. nom. sg. *fer* 'man' < PrimIr. **werah* < **wirah* < PC **wiros* by (c) but gen. sg. *fir* < PrimIr. **wiri* < **wirī* or nom. sg. *mil* 'honey' < PrimIr. **milih* < **melis* (cf. Lat. *mel*, Gk. *μέλι*) by (b) but gen. sg. *melo* < **melōh* < **melōs*.

Being confined to stressed syllables was not the only respect in which (b) was more restricted than (c), which seems only to have been impeded in the case of *i* (as opposed to *ī*) by intervening *nd* on the evidence of OIr. *find* 'white' < PrimIr. **wiNda(h)* < PC **wind-os/-ā* (Gaul. *-uindos*, MW m. *gwynn*, f. *gwenn*). Raising in (b) by contrast frequently failed to take place over a voiceless consonant or a group of consonants, although the precise details have yet to be worked out: e.g., OIr. nom. sg. *ech* 'horse', *nert* 'strength' < **ekwos*, **nertom* and unraised gen. sg. *eich*, *neirt* < **ekwī*, *nertī*; OIr. nom. sg. *mes* 'judgement', gen. sg. *meso* < PrimIr. **messuh*, **messōh* < PIE **med-tu-s*, **med-tew-s* (OIr. *mid-ithir* 'judges' < PrimIr. **meðiθor* < **med-ye-tor*) unlike nom. sg. *fius* 'knowledge', gen. sg. *feso* < PrimIr. **wissuh*, **wessōh* (< **wissōs*) < **wid-tu-s*, **wid-tew-s* (more in *GOI* 47-9; see II.2.2 on *dt* > *ss*).

2.2 Prior to raising in 2.1(b) stressed *e* was lowered to *æ* before *γ/γʷ* and *e/i* unless the following syllable contained *y* (McCone, *SnaG*, 79). Hence nom. sg. **deγʷih* > **dæγʷih* > OIr. *daig* 'flame' but gen. sg. **deγʷōh* > OIr. *dego*; dat. sg. **tegesi* > **tegis* > **teγih* > **tæγih* > OIr. *taig* (Wb.) but nom./acc. sg. **tegos* > **teγah* > OIr. *tech* 'house' and gen. sg. **tegesos* > **tegisos* > **teγiyah* by 2.1(b) > **tiγˊeyah* by 2.1(c) > OIr. *tige* (*Fél.*); 3 sg. **Leγeθi* > **Læγeθi* > OIr. *laigid* 'lies' but 3 pl. **Leγodi* > OIr. *legait* and verbal noun nom./acc. **Leγiyan* > **Liγˊeya(n)* by 2.1(b) and (c) > OIr. *lige* 'lying'. On the evidence of OIr. *dér* 'tear' (MW pl. *dagreu*; Gk. *δάκρυ* etc.) < **dɛ̄r* (cf. *ɛ̄d/g* < *ænt/k* in 1.4) < **dæxr* < **dakro-* vs. OIr. *ár* 'slaughter' (OW *hair*, MW *aer*) < **aγr* < **agro-* a similar fronting occurred before *xr* (see *GOI* 78 for arguable examples of this development before *xl/n*) but not *γr/l/n*. Since an example like *feidid*, *-feid* 'leads' shows that lowering to *æ* did not occur before a dental, the reflex seen in 3 sg. *saidid*, *-said* 'sits', 3 pl. *sedait*, *-sedat* < **seðe/o-* must be due to the analogical influence of *laigid*, *legait*.

Schrijver (1995, 134-41) has argued, on the strength of a couple of British instances explicable in terms of *eg* > *æg* > Brit. *ag*, for Insular Celtic *ege/i* > *æge/i*. This then yielded *iγ* by raising but otherwise *aγ* in Old Irish. Thus Schrijver (1995, 139-40) would ascribe a case like *lige* to straightforward raising of **lægi(y)an* to **ligi(y)an* but then has to invoke 'the numerous restrictions to which the law of raising is subject' in general and three separate *ad hoc* rules in particular to account for its absence in OIr. *daig* 'flame' < **deγʷi-*, *graig* 'flock' < **greγi-*, *aig* 'ice' < **yeγi-*. Since, as just pointed out in 2.1, an intervening single voiced consonant seems to have been maximally conducive to raising, these three forms speak strongly against Schrijver's formulation of the split between *iγ* and *aγ* and in favour of the contention here that the former only arose where the following syllable contained *y*. Nevertheless, there remains a serious possibility that *eγe/i* > *æγe/i* occurred as early as Insular Celtic, although the British evidence is suggestive rather than conclusive.

2.3 Stressed *a* was diphthongised to *au* before *u/ū* in the following syllable (Greene, 1976, 28-9): e.g., OIr. nom. sg. *ball* 'limb' < **baLah* (< **-os*) but dat. sg. *baull* < **bauLu* < **baLū(i)* and acc. pl. *baullu* < **bauLū* (< **-ūs*). Og. CALUNO- > **Cauluna-* > **Caulona-* > OIr. *Caulann* shows that this happened some time before lowering in (c) above. Unstressed *a*, however, was not affected by *u*-colouring: e.g., *marbad* 'killing' < **marwaθuh* < **-ātus* as opposed to *léiciud* 'letting' < **lēgiθuh* < **-ītus*.

Dat. sg. **wirū* (< PC **wirūi*) was shortened to **wiru* in accordance with 2.1(a), whereas acc. pl. **wirūh* (< PC **wirūs*) remained unchanged. The diphthongs *eu, iu, ou* then arose as a result of the assimilatory effects of a short *u* upon *e, i* and *o* respectively (Greene, 1976, 29-30). Thus dat. sg. **wiru* > **wiuru* > OIr. *fiur* '(to a) man' vs. acc. pl. **wirūh* > **wirū* > OIr. *firu*. Likewise *o*-stem dat. sg. **NeRtū* > **NeRtu* > **NeuRtu* > OIr. *neurt* '(to) strength', **Roθū* > **Roθu* > **Rouθu* > EOIr. *routh* '(to a) wheel', *u*-stem nom. sg. **wissuh* > **wiussuh* > OIr. *fius* 'knowledge'. As the contrast between *fius* and *mes* < **messuh* shows, *u*-colouring did not affect stressed *e* across *ss*. In unstressed syllables, however, *u* was added to *e* as well as *i*: e.g., OIr. *tomus* 'measurement' < **toveu(s)suh* < **tovessuh* < **to-messus*, *dorus* 'door' < **doreu(s)suh* < **doressuh* < **d(w)ores-tu-s*.

The contrast between OIr. deut. *as:biur* 'I say' < **biuru* < **biru* < **berū* (raising of stressed *i* by 2.1b) and prot. *-epur* < **e-buru* < **eɣ-beuru* < **ex(s)-berū* also indicates that unstressed *eu* became *u* but it is clear from examples like dat. *cenéul* '(to a) family' < **keneuθlu* < **keneθlu* < **kenetlū* that this happened after the compensatory lengthening in 5.1.

Note the parallelism between nom./acc. sg. *fer* 'man', *céile* 'fellow' (< **wera-*, **kēl´eya-* < **wira-*, **kēliya-* by 2.2c), gen. sg. *fir*, *céili* (< **wir´-i*, **kēl´-ī* < **kēliy-i* < **kēliy-ī*), dat. sg. *fiur*, *céiliu* (< **wiuru*, **kēl´iuyu* < **wir-u*, **kēliy-u* < **-ū*).

2.4 An *æ* < *a* by fronting before nasal plus obstruent (1.3 and II.5.1) was retracted to *a* again before *mb* or *nd* followed by a back vowel (*a/o* and probably high *u*), whence OIr. *land* 'area, land' < **LaNd-a* < **LæNd-ā* < PC **land-ā* (> MW *llann*), OIr. *camb* 'crooked' < **kamb-ah* < **kæmb-ah/-ā* < PC **kamb-os/-ā*, *and* 'in it, there' < **aNd-an* < **æNdan* < PC **andom* < PIE **h₁n̥-dom* (Hitt. *andan*), OIr. *ambue* '(cowless) outlaw' < **æm* + **buwiyah* (OIr. *bue*) < **bowiyah* < PC **bowyos* < **gʷow-yo-s*.

An *æ* unaffected by this process by virtue of being followed by *ŋg(ʷ)* or by *mb/nd* plus a front vowel was subsequently raised and fronted to *ɪ* before nasal plus voiced stop: e.g., OIr. *cimbid* 'prisoner' < **kɪmb-iyaθih* < **kæmb-iyaθih* < **kamb-iyatis*; OIr. *ind-* 'in' < **INde* < **æNde* < PC **ande* (Gaul. *ande-*); OIr. gen. sg. *Imchado* (nom. *Imchad*) < **Imbĭxaθō* < Og. AMBICATOS /æmbixaθōh/ (McManus, 1991, 113; McCone, 1991, 67-8; cf. Gaul. *Ambicatus* < PC **Ambi-katus*); OIr. *ingor* 'anchor' < PrimIr. **ŋgura* < **æŋgurā* < Lat. *ancora* (/ankura/?); OIr. gen. sg. *imbe* (nom. *imb* 'butter'; cf. OC *amen-en*, MW *ymen-yn*, Lat. *unguen*) < PrimIr. **æmbēh* < PC **ambēs* < PIE **h₂ŋgʷ-en-s*. This raising took place before the lowering in 2.1(c) on the evidence of **d/tŋgʰwāt-* > PC **tangwāt-* > **tæŋgwāθ-* > **tɪŋgwaθ-* > **teŋgwaθ-* > OIr. *tengae* 'tongue'.

2.5 Although *y* seems to have been lost as early as Proto-Celtic in a couple of specific environments (II.3.1), it is clear from British and Continental Celtic that *y* was preserved in most contexts: e.g., Gaul. *Iantu-*, W *add-iant* 'longing' vs. OIr. *ét* 'jealousy' < **yænto-* or the **yowænko-* reflexes in II.5.1. Consequently its general absence in Irish is due to loss after the end of the Insular Celtic period, its retention until well into the fourth century at least being implied by McManus' attractive suggestion that the Ogam sign conventionally transcribed H originally had the value /y/ (I.5.1). This is supported by further linguistic considerations. To begin with, the epenthesis in 1.5 above presupposes the survival of postconsonantal *y* at that stage. Furthermore, despite different reflexes in Old Irish such as *o*-stem *fir* /fir´/ 'man's' < **wirī* vs. *yo*-stem *céili* 'client's' < **kēliyī*, the genitive singular of both *o*- and *yo*-stems is written -I in Ogam (McManus, 1993, 115): e.g., MAQ(Q)I (*o*-stem, OIr. *maic*), CORRBRI (*yo*-stem, OIr. *Coirpri*), LUGUNI (*yo*-stem, OIr. *Luigni*). The obvious explanation is that this -I represented /-i/ in the *o*- but /-ī/ in the *yo*-stems. If so, the latter must have arisen by contraction of **-ii* < **-iyī* after the former had been shortened to **-i* by 2.1(a). Whereas **-i* was lost by the apocope in 4.3, *yo*-stem **-ī* (like any long vowel that remained or arose after the shortening in 2.1a) survived in Old Irish as the corresponding short vowel. Thus **wirī* > **wiri* > **wir´ɪ* > OIr. *fir* but **kēliyī* > **kēlii* > **kēl´ɪ* > OIr. *céili*. This would place loss of *y*, in this environment at least, after the shortening of final vowels but before the contraction to **-ī* that seems to be regularly reflected in Ogam spelling and so probably took place rather early in the fifth century. So far there is no obvious obstacle to the economical assumption that a general loss of *y* occurred in Primitive Irish at that time, although it may have survived somewhat longer as a non-phonemic glide between *i* and *e* or a back vowel. Certainly the different outcome of *laigid* < **leɣeθi* and *lige*, gen. *ligi* < **leɣiy-an/-i* shows that *y* must still have been present when 2.2 applied (prior to 2.1b).

2.6 According to Kortlandt (1979, 46-7), after the shortening of unstressed vowels in 2.1(a) above the oppositions *i/e* and *u/o* were neutralised if the following syllable did not contain *i* or *u*. Subsequently *e* and *o* arose unless a palatal consonant intervened as in the case of voc. sg. *fir* 'man' < **wir´e*, *fiche* 'twenty' < *wix´ēh* or *cingid* 'steps' < **kɪ´ŋg´eθi* vs. pl. *-cengait* < **kŋgodi* or sg. *bong(a)id* 'breaks' < **buŋgeθi*. The main purpose of this rather elaborate modification of the conventional formulation of the basic raising and lowering rules in 2.1(b)-(c) is to account for the otherwise difficult *o* in verbs like *bong(a)id*, *-boing* or nom. pl. *coin* 'dogs', these last forms then being derived from **bungeh*, **kuneh* on the assumption that palatalisation of consonants between front vowels occurred before the palatalisation of any consonant by *e* or *i* in a final syllable. Although Kortlandt's rule provides the most straightforward morphological analysis of the *o*-vocalism of a few verbs like

-boing or *fo:loing* 'suffers', this is achieved at the expense not only of considerably complicating the raising and lowering rules but also of splitting the first palatalisation in 3.2 below into two chronologically distinct stages. More to the point, it is falsified by 3sg. pret. *luid* 'went' < **luðe*, which should have yielded OIr. **loid* in accordance with Kortlandt's formulation. Since 3sg. **loid* would have been quite distinctive and have alternated with *lod(-)* in the rest of the paradigm in a manner very similar to the pattern observed in *-boing*, *-bongat* etc., *luid* is clearly not analogical and Kortlandt's rule is invalidated.

Schrijver (1995, 51) lists eight arguable examples of *o* for *u* in Old Irish as a result of what he terms 'Kortlandt's restriction' and considers that 'the only true counterevidence, which I cannot explain, is offered by OIr. *·luid* 'went' < **lude(t)* and *·buig* 'broke' < **buge(t)* (Joseph 1990: 116). Both forms have word-final **-e* in PrIr. Might one suggest that *word-final *-e* merged with **-i* before lowering took place, as Pedersen thought...?' (1995, 51-2). This possibility is, however, ruled out by OIr. 2sg. imperatives such as *be(i)r* 'carry!', *du-m:em* 'protect me!' (not **bir*, **-im* < **beri*, **evi*) < **bere*, **eme*. Since it is almost certainly an innovatory Middle Irish *s*-preterite replacing OIr. reduplicated suffixless *-bobuig* (McCone, 1986, 230), *-buig* is not really a problem but that still leaves the extremely well attested *luid* as a fatal obstacle to Kortlandt's argument, and all of the examples adduced by Schrijver are susceptible to alternative explanations. Thus the adjective *sonairt* 'strong' may contain original *so-* rather than *su-*. The former probably arose by II.5.1 from **su-* before *w-* and perhaps also from prevocalic **suw-* in Proto-Celtic and then became somewhat productive, being attested alongside *su-* in Gaulish (Ellis Evans, 1967, 257) as well as having reflexes in Irish (*GOI* 231) and British (*LHEB* 659). As for OIr. *ar:ne-get* 'prays' allegedly from **are ni-g"ed-i-t*, Pokorny (*IEW*, 312) is surely right to suggest that full-grade *nē* < **nei* underlies OIr. *ar/ind:neat* 'awaits' < **are/ande nē-sed-e-t*, since **-niat* should have resulted from **ni-sed-* (or even **ne-sed-* by V.2.1; see McCone, 1993b, 64). Presumably, then, *ne* in *ar:ne-get* is due to shortening of **nē* on the analogy of *-neat* rather than to the operation of Kortlandt's rule upon **ni*. A possible morphological solution to the problem of *o* in verbs of the *-boing* type has been proposed elsewhere (McCone, 1991b, 41-7) and Joseph (1990) accounts for the vocalism of acc. sg. or nom. pl. *coin* 'dogs' by utterly straightforward derivation from the full-grade **kon-en/-es* (replacing **kwon-* under pressure from zero-grade weak **kun-*) with preservation of the strong stem proper to these cases in PIE rather than from the **kun-en/-es* with generalised zero grade posited hitherto. He also makes the reasonable assumption that MW *cwn* 'dogs' is from **kon-es*, which probably survives in Ptolemy's Οὐενί-κωνες (surely most unlikely to be a corruption of *-κυνες* identical with the Greek word for 'dogs'), in line with a British tendency to raise *o* to *u* before *n* seen in *mwn* 'neck' < **monis* (OIr. *muin*), for example. This has been disputed by Schrijver on the grounds that 'raising of **o* to **u* in British did not occur between **k* and a nasal' (1995, 50). Even if this were true and the British form must be from **kun-es*, that would not disprove the derivation of OIr. *coin* from surviving full-grade **kon-es*. Since, however, Schrijver's sole good example of non-raised *o* here is *cof* < **kov* and his only instances of non-raising before *n(n)* involve *e*, the possibility of MW *cwn* /kun/ < **kon* by raising is hardly excluded.

In conclusion, Kortlandt's rule and its ramifications can be dispensed with on the grounds that it is essential for none of the forms in question and is directly contradicted by OIr. *luid*.

3.1 PALATALISATION. The crucial Old (Middle and Modern) Irish opposition between non-palatal or broad and palatal or slender phonemes is clearly seen in minimal pairs such as OIr. *ráth* /Rāθ/ 'surety' vs. *ráith* /Rāθ´/ 'rampart', nom. sg. *mac* /mak/ 'son' vs. gen. sg./nom. pl. *maic* /mak´/ 'sons', 3 sg. pres. *be(i)rid* /ber´əð´/ 'carries' vs. subj. *ber(a)id* /berəð´/ 'may carry'. As has long been realised, the origins of this phenomenon are to be sought in the typologically widespread development of palatal and non-palatal allophones of individual consonant phonemes before front (*e/ē* or *i/ī*, cover symbol E) and back (*a/ā*, *o/ō* or *u/ū*) vowels respectively: cf. the allophonic variation in Modern English between palatal [k´] in words like *kill*, *keel* and non-palatal [k] in *call*, *cool* etc. Phonemicisation of such variation is by contrast rather less frequent, being confined to Irish within the Celtic group. The obvious mechanism for producing it was loss of previous distinctions between palatalising and non-palatalising vowels, an extreme case being complete disappearance of the vowel(s) in question. As we shall see, this phonemicisation of palatal versus non-palatal throughout the consonant system spread in several stages between Primitive and Middle Irish.

According to Thurneysen (*GOI* 102-3) single intervocalic non-labial and non-guttural consonants were palatalised before *e/ē* or *i/ī* in Primitive Irish without regard to the quality of the vowel before the consonant. Pedersen's treatment of palatalisation (*VKG* I, 345-8) rightly distinguishes between a consistently palatalising front vowel liable to apocope or syncope and a retained front vowel with a less marked palatalising effect, the precise details of which remained obscure: 'before a non-final unaccented originally front vowel palatalisation does not usually take place' (347). Martinet (1955, 199-211) was the first to realise that a preceding as well as a following vowel could play a role and this possibility was explored further by Cowgill (1969). Greene (1973) then produced a masterly synthesis and further development of these insights.

A central plank of Greene's approach was the difference, also apparent to Pedersen and Martinet before him, between a reduced front vowel (*ĭ* < *e*,

i) that palatalised any preceding consonant(s) before being lost by apocope or syncope and a less strongly palatalising retained front vowel. This distinction was needed in order to account for plentiful contrasts of the following type: *-tabair* 'gives' < **taver´-ɪ́* < **to-veret* vs. *-taibret* 'give' < **tav´ɪ́rod* < **to-veront*, *erbaid* 'entrusts' < **erbiθ´ɪ́* vs. *eirbthi* 'entrusts himself, trusts' < **er´b´ɪ́θ´i* < **erbiθiy-ɪ́(n)*. This retained front vowel only palatalised single consonants or groups of nasal plus stop (*mb, nd, ng*). However, whereas palatalisation in this case regularly occurred between two front vowels (E(N)CE > E(N´)C´E), position between a back and a front vowel was subject to more complicated rules depending upon whether the first vowel was rounded or unrounded, the consonant was labial/velar (C/P) or not (T) and the second vowel was *e* or *i*.

3.2 The first palatalisation, then, affected a single consonant (and *mb, nd, ng*) between two front vowels or between any vowel (except *ā*; see below) and high front *i/ɪ́*: e.g. OIr. *daig* 'flame' < **dæγʷ´ih* < **dæγʷih*; OIr. *laigid* 'lies' < **Læγ´eθ´ɪ́* < **Læγeθi* (between front *æ* and *i* or *e*); OIr. *beirid* 'bears' < **ber´eθ´ɪ́* < **bereθi* (between two *e*'s); *túaithe* (gen. sg. of *túath* 'kingdom') < **tōθ´eyāh* < **tōθ´iyāh* < **tōθiyāh*; *gaibid* 'takes' < **gav´iθ´ɪ́* < **gaviθi* (between back *ō* or *a* and *i(y)*); *ráithe* 'quarter (of year)' < **Rāθ´eya* < **Rāθ´iya* < **Rāθiyā* (between *ā* and *iy*). In accordance with this rule there was no palatalisation in cases like *canaid* 'sings' < **kaneθ´ɪ́* < **kaneθi*, *carae* 'friend' < *karɛ̄h*, *tocad* 'fortune' < *togeθah* (1.3; between *a* and *e*) or *erbaid* 'entrusts' < **erbiθ´ɪ́* < **erbīθi*, *ní:dén(a)i* 'does not do' < **-deγnīθ*, *áram* 'reckoning' < **aðrīvā* (two consonants).

When the preceding vowel was stressed and rounded, there was no palatalisation of a labial or guttural con-sonant between this and *i/ɪ́* but palatalisation of any other single consonant (or *nd*) did occur: e.g., *sluindid* 'names' < **sLuN´d´iθ´ɪ́* < **sLoNdiθi* < **sLoNdīθi*, *-cuirethar* 'puts' < **kur´eθor* < **korīθor*, *tuirem* 'recounting' < **tur´eva* < **torīvā* with palatalisation but *cucann* 'kitchen'< **kugena* (2.1), *ungae* 'ounce' < Lat. *uncia*, *do:lugai* 'forgives' < **-Luγīh* < **Loγīθ*, *umae* 'bronze' < **uveya* < **oviyan*, *ógae* 'wholeness' < **ōγeya* < **ōγiyā* without it. Palatalisation in the OIr. comparative *duibiu* 'blacker' is presumably analogical and, even though both *do:luigi* and *do:lugai* are attested in the Glosses, there would be no motive for introducing *lug-* /Luɣ-/ into a paradigm *luig-* /Luɣ´-/ with palatal stem-final consonant throughout in accordance with the normal weak *i*-present (W2) pattern, whereas the reverse is easy to justify.

This palatalisation must be dated before the lowering in 2.1(c), since the rule of non-palatalisation between a back vowel and *e* (as opposed to *i*) would otherwise have produced **túathae* < **tōθeyāh*, **ráthae* < **Rāθeyā* instead of actually attested *túaithe*, *ráithe* < unlowered **tōθ´iyā(h)*, **Rāθ´iya* and so on.

Greene's rule that a following *i* invariably palatalised a single consonant (or *nd*) that was neither labial nor guttural entails the assumption that the stem-final consonant of the weak *i*-verbs *ráidid* 'says' and *sáidid* 'places' (< **rāðīθi*, **sāðīθi)* was originally palatal throughout the paradigm. However, this is hard to square with Old Irish examples like pres. 3pl. *-rádat* (Ml. 31ª18), 3sg. rel. *rádas* (Ml. 42ᶜ4&10), 1sg. *-sádu* rhyming with *dánu* in *Félire Óengusso* (Jan. 23), subj. 3sg. *-ráda*. Since weak *i*-verbs of this type (W2a) normally had palatal final throughout (e.g. *-léicet*, *léices*, *-léiciu*, *-léicea*) it seems inconceivable that the non-palatal *d* so clearly seen in these forms was due to analogy. As with *do:lugai* above, it seems necessary to start from a paradigm which basically had a non-palatal stem-final consonant, whence 3sg. *-rádai* < **rāðɪ́* < **rāðīθ*, 3pl. *-rádat* < **rāðeyod* < **rāðiyod* < **rāðiyont* and so on. Wherever the front vowel was liable to syncope it will have first been weakened to invariably palatalising *ɪ́* (3.1 and 3.5), whence OIr. passive *-ráter* 'is said' < **rāð´θor* < **rāð´ɪ́θor* < **rāðīθor*. The basic point is that, unlike *a* or *o/ō*, *ā* impeded palatalisation of a following consonant by an *i/ɪ́*, whence *rádaid* 'says' < **Rāðiθ´ɪ́* < **Rāðīθi*, *cnámai* 'bones' < **knāvīh*, *máthair* 'mother' < **māθir* < **mātīr* (McCone, 1994, 281-2). Verbs like W2a *erbaid* 'entrusts', *sádaid* and *rádaid* with an inherited opposition between syncopated forms with palatal and unsyncopated forms with non-palatal stem-final consonant were then liable to experience spread of the non-palatal consonance from syncopated to unsyncopated forms in line with the majority W2a type (*léicid* etc.) with palatal final throughout, the upshot being *sáidid*, *-ráidi* etc. Unless their palatal *-th-* is analogical, forms like *ráithe* above (Ml. 93ᶜ7 *rathib* being, of course, ambiguous) and *áithæ* 'sharpness' (Sg. 108ª4) < **āθ´eya* < **ātiyā* seem to indicate that, unlike its voiced counterpart, a voiceless dental stop/fricative was palatalised between *ā* and *iy* (as opposed to *i/ɪ́* without *y*). A full collection of relevant examples is an obvious desideratum. Between an unstressed vowel and a back vowel *-(s)siy-* seems to have been simplified to *-sy-* and then *-s-* before palatalisation: e.g., 3sg. rel. *s*-pret. *marbas* < **marw-asa* < **-asya* < **-assi-yo* (McCone, 1995, 130-2).

After the raising of a preceding stressed *e*, *o* in 2.1(b) by *i* (but not *e*) and the loss of final *-n* or *-h*, short *e* and *i* were apparently reduced in absolute final position to a palatal schwa *ɪ́* that palatalised any preceding consonant(s) except the group *cht* regardless of the vowel that stood before it/them: e.g., OIr. *baird* 'bards' < **baR´d´ɪ́* < **baRdi* < **baRdɪ́*; *mil* 'honey' < **mil´ɪ́* < **mili* < **melih*; OIr. nom./acc. sg. *ainm* 'name' < **an´m´ɪ́* < **anme* < **anmen* but gen. sg. *anmae* < **anmē* < **anmēh* and nom./acc. pl. *anmann* 'names' < **anmen*< **anmena*; 3sg. conj. *-cain* 'sings' < **kan´ɪ́* < **kane* < **kaneh* < **kaneθ* vs. abs. *can(a)id* < **kaneθ´ɪ́* < **kaneθi*. The details of this process are sufficiently different from those of the foregoing to raise doubts

as to whether they should be lumped together. On the other hand, since this palatalisation must have occurred between raising and apocope and the former must have preceded lowering, they appear chronologically compatible and it seems most economical to make them contemporaneous as a first palatalisation between the post-raising (2.1b) emergence of *-ɤ́* and lowering (2.1c).

3.3 As is clear from the foregoing, the first palatalisation predated lowering of *i, u* > *e, o* before a low back vowel in 2.1(c). Since it follows from 3.4 below that the palatalisation of an initial consonant or group of consonants by following stressed *e/ē* or *i/ī* occurred after this lowering, this process constitutes a second palatalisation: e.g., OIr. *beirid* 'bears' < **b´er´eθ´ɤ́* < **ber´eθ´ɤ́*, *mligid* 'milks' < **m´l´iɣ´eθ´ɤ́* < **mliɣ´eθ´ɤ́*, *scél* 'story' < **skʷ´eθla* < **skʷeθlan*. Low front *æ* (< *e* by 2.2) may have been retracted to low back *a* between the first and second palatalisations. At any rate, it did not palatalise an initial consonant: e.g., *laigid* 'lies' (< **Laɣ´eθ´ɤ́?*) < **Læɣ´eθ´ɤ́* < **Leɣeti* vs. 3pl. *legait* < **L´eɣod´ɤ́* < **L´eɣonti*, *daig* 'flame' (< **daɣʷ´ɤ́*) < **dæɣʷ´ɤ́* < **deɣʷih* vs. gen. sg. *dego* < **d´eɣʷō* < **deɣʷōh*.

3.4 Older Ogam inscriptions still distinguish *kʷ* from *k* by means of the signs transcribed Q and C respectively but C can be used for both on later inscriptions: e.g., gen. sg. CUNAMAQI /kunaṽakʷi/ (OIr. nom. *Conmac*) but MAC /mak´/ for earlier MAQI /makʷi/ (OIr. nom. sg. *mac* 'mac' < **makʷkʷos*, MW *mab* < **makʷos*, Gaul. acc. sg. *mapon*). It would appear, then, that simplification of *kʷ* and *gʷ* to *k* and *g* took place in the course of the sixth century A.D. (McManus, 1991, 90; McCone, 1991, 38-45).

However, prior to loss of the labial element *i* and *a* were rounded to *u* and *o* respectively after *kʷ* or *gʷ*: e.g., OIr. *coire* 'cauldron' < **kʷor´eya* < **kʷariyah* < **kʷaryos* (> MW *peir*) < **kʷɾ-yos*; OIr. *goire* 'filial piety' < **gʷor´eya* < **gʷariyā* (> MW *gwared*) < **gʷɾ-yā*; OIr. *cruth* 'shape' < **kʷruθu* < **kʷriθuh* < **kʷritus* (> MW *pryt*) < **kʷɾ-tus*; OIr. *guidid* /guð´əð´/ 'prays' < **gʷuð´iθ´ɤ́* < **gʷiðiθi* < **gʷeditі* (cf. MW *gwediaf*). In view of the failure of this rounding to affect *e* (e.g. OIr. *cenn* 'head' < **kʷennom*), it must be assumed that **gʷeði-* had already been raised to **gʷiði-* and **kʷrina-* lowered to **kʷrena-* by the time it applied in order to generate OIr. *guidid* 'prays' and *crenaid* 'buys' (instead of **geidid*, **crunaid*; see McManus, 1992, on some paradigmatic anomalies and skews resulting from this sequence). Consequently *i* > *u* here must be dated after the lowering in 2.1(c), whereas it has been seen that the first palatalisation must have predated lowering. If, however, the second palatalisation had antedated *i* > *u* after a labiovelar, one would expect OIr. **criuth* /*k´r´uθ/ instead of actually attested *cruth* /kruθ/ 'shape' and so on. Therefore, the lowering in 2.1(c) must be placed between the first palatalisation in 3.2 and the second palatalisation of initial consonants by stressed *e/ē* or *i/ī* in 3.3.

3.5 The third palatalisation came about after the truncation or loss of final syllables (4.3 below) when the front vowels *e, i* and *ü* (< *u* before a front vowel *i/e* in the following syllable; Greene, 1973, 134) fell together as palatal schwa *ɤ́* in a non-final internal syllable directly after the first syllable bearing the main stress and (where applicable) after the third syllable probably bearing secondary stress. Like its counterpart produced before the apocope (3.2), this sound palatalised any preceding consonant(s) and can probably be seen in Ogam TOGITTAC /Tog´ɤ́θax´/ < **Togeθaxi* < **tonketākɤ́*. One would expect OIr. gen. sg. **Tocthaig* instead of actually attested *Toicthig* (3.1 above and McManus, 1991, 89) but for this development, which accounts for alternations such as OIr. *tocad* 'fortune' < **togeθ* < **togeθah* < **tonketos* (MW *tynghet*) vs. *toicthech* 'fortunate' < **tog´ɤ́θax* < **togeθaxah*, OIr. *erbaid* 'entrusts' < **erbiθ´* < **erbīti* vs. *eirbthi* 'entrusts himself, trusts' < **er´b´ɤ́θ´i* < **erbītiy-en*, OIr. *tabair* 'give!' < **taver´* < **taver´ɤ́* < **to-vere* but *taibred* 'let him/her give' < **tav´ɤ́r´eθ* < **taver´eθo*, nom. *Luguid* < **Luɣuð´* < **Luɣüð´e(h)* < **lugu-dex-s* vs. gen. *Luigthech* < **Luɣ´ɤ́ð´ex* < **Luɣüð´ex* (Og. LUGUDEC) < **Luɣüðexa(h)* (Og. LUGUDECA, LUGUDECCAS; McManus, 1991, 89) < **lugu-dek-os*.

Greene's (1973, 134) suggestion of a parallel reduction of *a, o* and unfronted *u* to non-palatal schwa (here represented by *ŭ)* in post-tonic syllables would entail derivations like OIr. *frecrae* 'answer' < **w´r´egŭr´e* < **wregar´e* < **wregar´eya* < **wri(t)gariyan*, OIr. *-dílgai* 'forgives' < **dīlŭɣ´ɤ́* < **dīloɣ´ɤ́* < **dīloɣɤ́θ*. However, whereas its stronger palatalising effects help to distinguish *ɤ́* from *i, e* or *ü*, non-palatal *ŭ* behaved no differently from *a, o*, or *u* with the result that this reduction cannot be proved on the strength of Old Irish itself. Neverthless, some support is provided by various spelling fluctuations in Ogam such as CATTUBUTTAS /kaθuvuθah/ vs. later [CAT]TABOTT /kaθŭvoθ/ (McManus, 1991, 89). It would seem that even front vowels in a post-tonic syllable became non-palatalising *ŭ* rather than palatalising *ɤ́* before non-palatal *h*: e.g., *cuicce* 'to her' < **kug´ʰh´e* < **kug´ɤ́h´e* < **kʷugeh´eyan* < **kʷunk(ʷ)e-siyan* but *cuccu* 'to them' < **kugʰhu* < **kugŭhū* < **kugehūh* < **kʷunk(ʷ)e-sūs* (McCone, 1993c), prot. *-impai* 'turns' < **ɪmphoy* < **ɪmbʰhoy* < **ɪmbŭ-how´* < **æmbi-sowet(i)*, *-intamlathar* 'imitates' < **ɪnthaṽl-* < **ɪndʰhaṽʰl-* < **ɪndŭ-havŭl-* < **ænde-samal-*.

In view of the hopeless confusion resulting from Russell's (1995, 32) failure to recognise this basic fact (see 3.3 of McCone, forthcoming c), it is to be stressed that these reductions of short vowels to palatal and non-palatal schwa only took place in non-final post-tonic syllables subsequently liable to syncope and did not affect the vowels of other unstressed syllables, which escaped not only syncope but also, as has usually been inferred from the good evidence of the small corpus of Early Old Irish material (V.4.3), this pre-

liminary weakening.

4.1 LOSS OF FINAL CONSONANTS AND VOWELS. It has been seen firstly that a final voiceless fricative (basically *-(s)s* by 1.2 above and *-θ*) became *-h* after the Irish lenition (III.4.4) and secondly that unstressed long vowels were shortened except in front of this *-h* (2.1a) prior to lowering of short *u* or *i* before *a* or *o* (2.1c) and in advance of *u*-affection of *e, i, o* (2.3). Thus nom. sg. **Rīh* 'king' < **Rīs(s)* < **rīx-s*, gen. sg. **Rīγah* < **rīg-os*, acc. pl. **Rīγāh* < **rīg-ās* (<**-ans*), gen. pl. **Rīγan* < **rīg-om*; nom. sg. **werah* 'man' < **wir-os*, gen. sg. **wiri* < **wirī*, dat. sg. **wiuru* < **wirū* (< **-ūi*), acc. pl. **wirūh* < **wirūs*, gen. pl. **weran* < **wir-om* < **-ōm*; nom./acc. sg. **arwar* 'grain'; pres. ind. 3 sg. abs./conj. **bereθi/ *-bereh* (< **bereθ*) 'bears', 3 pl. **berodi/*berod* (< **-ont(i)*).

After a voiced consonant *w* became *v*, as is clear from OIr. *marb* /marv/ 'dead' < **marvah* < PC **marwos*, *arbar* /arvar/ 'grain' < **arvar* < PC **arwar*, *fedb* /feδv/ 'widow' < **wiδva* < PC **widwā*, *ainb* /an´v´/ 'ignorant' < **anvih* < PC **an-wiss*. It is necessary to posit that final *-n* was still present to change initial *w-* > *v-* across the word boundary too in syntactically close groups: e.g., gen. pl. OIr. *inna fer* /iNa ver/ 'of the men' < **inda vera* < **indan veran* < **indan weran* < **(s)indom wirom*. Presumably *w* combined with a preceding *h* as voiceless *f* at about the same time: e.g., OIr. *seinnid* 'plays' < **swen-e-ti* but reduplicated preterite *sefainn* 'played' < **sefone* < **sehwone* < **se-swon-e*, nom. sg. OIr. *in fer* 'the man' < **inda fera* < **indah werah* < **(s)indos wiros*, OIr. *a fiur* 'his sister' < **eya fiūr* < **e(h)ya hwehūr* < **esyo swesūr*.

4.2 Final *-h* and *-n* were then lost in various ways. Although it disappeared without trace before a following consonant other than *w-*, final *-h* was shifted from the end of its own word to the beginning of a following word with initial vowel in syntactically close groups: e.g., nom. sg. **iNdah Rīh maθih* > **iNda Rī maθi* 'the good king' but **iNdah exʷah begah* > **iNda hexʷa bega* 'the little horse' or nom. pl. **iNdāh eledīh* > **iNdā heledī* 'the deer' (OIr. *inna eilti* /iNa hel´d´i/). Final *-n* was lost without trace before *l-, r-, n-, m-, s-* but changed *t-, k$^{(w)}$-, w-* to *d-, g$^{(w)}$-, v-* (1.3 and 4.1) and was shifted to a vowel or *b-, d-, g$^{(w)}$-* at the beginning of a syntactically close following word: e.g., gen. pl. **iNdoihan Rīγan* > **iNdoya Rīγa* 'of the kings', **iNdoihan weran tanawiyan* > **iNdoya vera danaw´eya* 'of the thin men', acc. sg. **iNdan exʷan began* > **iNda nexʷa mbega* 'the small horse' (OIr. *in n-ech mbecc*). It is not surprising that examples of this development are to be found on Ogam inscriptions: e.g., gen. pl. TRIA MAQA without *-n*, gen. sg. DECCEDDAS, DEGOS with /-h/ (I.5.2) and DECEDA, DEGO without it.

As the examples in the preceding paragraph show, before this crucial phase the occurrence of non-mutation, nasalisation and lenition was mechanically conditioned by the auslaut or lack of a syntactically close preceding word: non-mutation after a juncture or a non-nasal consonant (e.g. **iNdah kaliyaxah tanawiyah* 'the thin cock' in III.4.4), nasalisation after *-n* and lenition after a vowel (e.g., **iNdā xloxā θrumbā* 'the heavy stone' in III.4.4). Henceforth, however, a final vowel might be followed by non-mutation, *h-* prefixed to a vowel, nasalisation or lenition of a consonant according to the word and/or grammatical category to which it belonged, as the examples after > in the previous paragraph show. Consequently it was no longer a question of mere allophonic variation but of grammatically significant phonemic alternations. The Primitive Irish reflexes of PIE **esyo* 'his' (masc., Skt. *asya*), **esyās* 'her' (fem., Skt. *asyās*) and **eysōm* 'their' (pl., Skt. *eṣām*) will serve to illustrate this: **eya θeγah/exʷah* > **eya θeγa/exʷa* 'his house/horse' but **eyāh teγah/ exʷah* > **eyā teγa/hexʷa* 'her house/horse' and **eyan teγah/exʷah* > **eya deγa/nexʷa* 'their house/horse'. Thus before the loss of final *-n* or *-h* the form of the possessive pronoun itself distinguished these three instances in Primitive Irish as in other old Indo-European languages like Sanskrit, whereas after it the form of the beginning of the word following the pronoun was the differentiating factor as it has continued to be in this and similar cases in Irish since the fifth century A.D.

4.3 The next stage was the apocope, which deleted any short unstressed vowel at the end of a word, whether this had always been a short final vowel, had been shortened by 2.1(a) or had been left in absolute auslaut by loss of a following *-h* or *-n* in 4.2. A short vowel was saved from loss by a following final consonant and a long vowel was retained in absolute auslaut: e.g., **arwar* (> OIr. *arbar*), **berod* (> OIr. *(-)berat*), gen. sg. **deγʷō* (< **deγʷōh*; OIr. *dego*), acc. pl. **wirū* (< **wirūh*; OIr. *firu*) in 4.1 above. On the other hand, the (final short) vowel was lost in cases like voc. sg. OIr. *(a) fir* 'o man!' < **wir´* < **wir´-ī* < **wir-e* (< PIE **-e*); gen. sg. OIr. *fir* < **wir´* < **wir´-ī* < **wir-i* (< **wir-ī* by 2.1a); nom. sg. OIr. *fer* 'man' < **wer* < **wera* (< **werah* by 4.2).

As a result of 4.2 a final vowel could trigger any mutation depending on lexical or grammatical category and this further development brought the same situation about after a final consonant: e.g., nom. sg. **iNd hex beg* (OIr. *int ech bec*) 'the little horse' < **iNda hexʷa bega* but **iNd xlox θromb* (OIr. *in chloch thromm*) 'the heavy stone' < **iNda xloxa θromba* (< **iNdā klokā trumbā*); acc. sg. **iNd nex mbeg* (OIr. *in n-ech mbec*) < **iNda nexʷa mbega*.

Until the apocope palatal and non-palatal variants of single consonants (and *mb, nd, ng*) were basically in complementary distribution conditioned by the flanking vowels. The lowering in 2.1(c) was responsible for one very limited exception to this in the case of a consonant preceded by *a*, since

palatalisation had been caused by a following *i* but not by *e* in this environment. Consequently, once *i* had been lowered to *e*, a marginal phonemic opposition arose between palatal and non-palatal consonants flanked by *a* and *e*: e.g., *aided* '(violent) death' < **að´eθa* (< **að´iθa* < **aðitā*) vs. *adaig* 'night' < **aðex$^{(w)}$´ɪ* (< **aðek$^{(w)}$ɪ*). Nevertheless, a major consequence of apocope was the establishment of a widespread phonemic opposition between non-palatal and palatal consonants in auslaut after the originally conditioning vowel had been lost. Before the apocope *x^{w}´*, *x´* etc. were simply allophonic variants of *x^{w}*, *x* etc. before palatal schwa *-ɪ*: e.g., nom. sg. **ex^{w}a*, dat. sg. **eux^{w}u* but gen. sg. or nom. pl. **ex^{w}´ɪ*, 3 pl. ipv. (or pres. ind. conj.) **berod* but 3 pl. pres. ind. (abs.) **berod´ɪ*. Once apocope had reduced these to **ex*, **eux* and **ex´* (> OIr. *ech*, *euch*, *eich*), **berod* (> OIr. *berat* 'let them bear') **berod´* (> OIr. *berait* 'they bear') respectively, the basic differentiating factor became the quality of the final consonant in place of the nature of the final vowel.

5.1 COMPENSATORY LENGTHENING AND SYNCOPE. As a result of 2.1(a) the only long unstressed vowels to survive in Primitive Irish will have been in absolute final position (after loss of *-h* by 4.2). Since short vowels in absolute auslaut had been lost by the apocope, there will no longer have been phonemic distinctions of length in Primitive Irish unstressed syllables: all internal unstressed vowels were short and all final unstressed vowels long. Before long, however, new internal unstressed long vowels were created by compensatory lengthening in the wake of loss of a dental or guttural fricative between a vowel and *l*, *r* or *n* (details of the combinations involved in *GOI* 78-9): e.g., OIr. *cenél* 'race' < **k´en´eθl* < **kenetlom* (OW *kenetl*); OIr. *úan* 'lamb' < **ɔ̄n* < **oγn* < **ogno-s* (MW *oen*; Lat. *agnus*); OIr. *áin* 'driving' (verbal noun of *agid*) < **aγ´n´* < **ag-ni-s*; OIr. *én* 'bird' < **eθn* < **et-no-s* (MW *ed(y)n*; IE **pet(h$_2$)-* 'fly', Lat. *penna* < **pet-nā*). The lost consonant left rounding as well as compensatory lengthening behind after *i* and/or before a palatal consonant: e.g., 1 sg. *ad:gén*, *-aithgén* 'I recognised' < **-g´eγn* < *-gegna* vs. 3 sg. *ad:géuin*, *-aithgéuin* '(s)he recognised' < **-g´eγ´n´* < **-gegne*, nom. sg. *én* vs. gen. sg. *éuin* or *éoin* < **eθ´n´* < **eθni* < **etnɪ*, 3 pl. *ar-a:chĺurat* 'they will perish' < **-kixreod* < **kixriyod* < **kikrɪsont(ɪ)*. The fricative seems to have been restored on occasion through morphological pressure as in the case of verbal noun *fognam* 'serving' or prot. *-fognai* 'serves' (for expected **-fón-*) corresponding to deut. *fo:gní*.

Since its failure to affect *sɪl* 'seed' < **sɪlan* < **sɪlom* etc. demonstrates the inapplicability of lowering to long vowels, it follows from examples like *muinél* 'neck' < **mun´exlah* < **moniklos*, *célaid* 'will conceal' < **kexlaθ´ɪ* < **kiklāseti*, *-cúalae* 'heard' < **kɔ̄le* < **koxlē* < **kuxlow´* < **kuklowe* (Skt. *śuśrāva*) that the compensated loss of certain fricatives before a liquid or

n occurred after 2.1(c). Consequently there is much to be said for Greene's (1973, 132-3) view that this development postdated the apocope. Thurneysen's (*GOI* 67) simple rule that syncope deleted any post-tonic vowel, whether long by compensation or short, was objected to for the sound reason that 'this does not hold good for the new long vowels..., as our example *toscélad* shows' (Greene, 1973, 134; < **-sk^{w}eθl-*). One might further note unsyncopated dat. pl. *cenélaib* 'races' < **ken´eθlov´*, *muinélaib* < **mun´exlov´* or regular retention of the *é* of certain futures as in prot. *-tibérad* 'would give', but there also seem to be instances of syncope such as augmented 1 sg. subj. *-árladar* 'I may address' < **-að-rɔ̄laðar* < **-að-ro-γlāðār* or ipf. subj. 1sg. *do:róininn* 'I might do' < **de ro-γn-eN´* vs. prot. *-dernainn* < **-de-r†-n-eN´* < **-de-rɔ̄n-* < **-de-ro-γn-*, which indicates that syncopated *do:rigni* 'has done' was the regular OIr. outcome of **de ri-γɛ̄ni* < **de ro-γeγni* and the variant *do:rigéni* due to the analogy of prot. *-deir†géni* (similarly fut. 3pl. *-dignet* 'will do' < **-di-γɛ̄nad* < **-de-γiγnād* vs. *-digénat* with clear fut. *é* under the influence of deut. *do:génat*).

It thus looks as though compensated loss of γ befoe *r/l/n* occurred before the syncope (5.3), which consequently affected the resultant long vowel in the post-tonic syllable whereas there was apparently no syncope of a compensatorily lengthened vowel resulting from the disappearance of a fricative such as *θ* or *x* before *r* (*x* only), *l* or *n*. The obvious explanation for the difference is that the latter clusters had not yet been simplified at the time of syncope, the upshot being that the vowel of the post-tonic syllable was retained before such a cluster as before *cht* (e.g. *cumachtach* 'powerful', dat. pl. *cumacht†gaib*, comp. *cumacht†gu* with loss of the third instead of the second syllable; cf. *cenélach* 'racial', fem. nom. pl. *cenél†cha*) and only later lengthened in compensation for the subsequent loss of the fricative. Some support may come from a special case involving hiatus, namely OIr. *biáil* 'axe' (Sg. 46^{b}6), gen. *béla* (long vowel fixed by rhyme and consonance in a quatrain in *ZCP* 1, 455), if < **beaθ´l´* < **biyatlis* (< **beya-*, root **b^{h}eyh* 'strike') and syncopated **be†θlō* < **biyatlōs* respectively (leaving the extraordinarily difficult British forms out of account; see Schrijver, 1995, 323). That said, lack of syncope in *gabál* 'taking' < **gavaγlā* (MW *gauael*), gen. sg. *gabálae* would then have to be ascribed to analogical restoration of the long-vowel suffix throughout the paradigm, a possibility that might then be entertained in the case of *cenélaib* etc. Pending a badly needed collection and evaluation of all relevant forms, we may provisionally posit two stages, namely (a) pre-syncope compensated loss of voiced γ before *r/l/n* and (b) post-syncope compensated loss of voiceless *x* and *θ* at least in roughly the same environment. However, it also seems just possible on present evidence (but only if the explanation of *béla* just offered is not accepted) to operate with a general compensatory simplification of the relevant

clusters under (a) and subsequent analogical tendencies to restore the long vowel. If at least some simplifications of this type postdated the syncope, they must nevertheless have been completed before the subsequent development of an anaptyctic vowel in front of interconsonantal or postconsonantal final *r, l* or, under certain circumstances, *n* (V.1.2). Obviously **ken´eθl* must have become **ken´ɛl* before **araθr* with its unsimplified cluster became **araθər* (OIr. *arathar* 'plough') after syncope had applied.

It will emerge later (V.4.1) that the new *ɛ̄* due to compensatory lengthening here and in 1.3 was different from the old *ē* probably inherited from Proto-Celtic. It seems likely that the phonemes in question were mid low /ɛ̄/ by compensatory lengthening and older mid high /ē/ and it may be reasonably assumed (see VI.2.7) that there was a similar difference between a new mid low /ɔ̄/ by compensatory lengthening and older mid high /ō/ (< PC *ow* by III.5.7). This implies a shift from the inherited system on the left to that on the right below.

ī	ū	ī	ū
ē	ō	ē	ō
		ɛ̄	ɔ̄
ā		ā	

5.2 When unstressed *e* or *i* stood between two homorganic consonants (e.g., two labials or gutturals) the first of these was subject to dissimilatory loss if preceded by a stressed vowel. In the case of stressed *a* or *o* a diphthong (*aí/áe*, *oí/óe* respectively) resulted from contact with the unstressed front vowel: e.g., OIr. disyllabic *deac* 'plus ten' < **de[x´]eg* (< **deken-kan* < *-kom* 'with ten' in numerals 11-19; McCone, *SnaG*, 204-5; cf. Schrijver, 1993b), deut. *con:imthet* 'accompanies' vs. verbal noun *coímthecht* 'accompanying' < **ko[v´]im´b´iθ´ext* or deut. *ro:cechain* 'has sung', *do:tét* 'comes', *fo:lilsitis* 'they would endure' vs. prot. *-róechain* < **ro[x]exan´*, *-táet* < **ta[θ]ed*, *-foílsitis* < **wo[l´]ilūs´ed´is´*.

5.3 The next step was syncope, which affected every second non-final syllable, taking the stressed syllable as first in the sequence, and had far-reaching grammatical consequences. As examples such as *coím†thecht* < **coim´b´[ʃ]θ´ext* and *-foil†sitis* < **woil´[ʃ]s´ed´is´* above show, syncope came after the dissimilation in 5.2. The principal effect of the basic syncope rule was to eliminate the second syllable of a three- or four-syllable word and also the fourth syllable of a five- or six-syllable word: e.g. (lost syllable marked †), OIr. nom. sg. *lepuid* 'bed' < **L´ebuθ´* vs. gen. sg. *lep†tho* < **L´eb[o]θo*; OIr. nom. pl. *carait* 'friends' < **kared´* vs. acc. pl. *cair†tea* < **kar´[ʃ]dā* < **kareda*; OIr. *prid†chid* 'preaches' < **p´r´ið´[ʃ]xaθ´* < **preðixaθi* < Lat. *pr(a)edicat*; OIr. 3 pl. deut. *for:berat* 'they increase' < **wor b´erod* vs. prot. *-foirb†ret* < **wor´b´[ʃ]rod* < **worberod*; OIr. 3 sg. deut. *con:os†na* 'rests' < **kon os[a]nā* (< **u(s)s-anāh*) vs. prot. *-cum†sana* < **kuṽ[o]sanā* (< **koṽ-u(s)s-anāh*); OIr. nom. pl. *brith†emain* 'judges' < **b´r´iθ´[e]aṽon´* < **briθi-yaṽoneh* vs. acc. pl. *brith†em†na* < **b´r´iθ´[e]aṽ[o]nā* < **briθiyaṽonāh*; OIr. 3 pl. pret. deut. *do:rósc(†c)aisset* 'stood out' < **de rōsk[o]xisod* vs. prot. *-der†scaig†set* < **der[o]skox´[ʃ]sod*.

As indicated in 4.3, the first significant phonemicisation of palatal consonants came about in final position after the apocope of a conditioning front vowel. What had hitherto been an allophonic alternation in internal post-tonic syllables between non-palatal consonants before a back vowel and palatal variants of the same before *ɾ* from a front vowel in this position (3.5) was now phonemicised by loss of the conditioning vowel. Henceforth palatalisation was phonemic at the end of internal (e.g., acc. pl. /*kar´dā/ 'friends', 3sg. pres. /*prið´xaθ´/ 'preaches') as well as of final closed syllables (e.g., 3pl. pres. /berod´/ 'they bear' in 4.3).

CHAPTER FIVE

From Early Old Irish to Middle Irish

1.1 CONSONANT GROUPS ARISING BY SYNCOPE. Between them the apocope of c. 500 A.D. and the roughly mid-sixth-century syncope constitute a watershed marking the emergence of a language agreeing in all typological essentials with the so-called 'Classical' Old Irish adequately documented in eighth- and ninth-century sources. That being so, it is convenient to take syncope as the final stage of the **Primitive Irish** epoch discussed in the previous chapter and apply the term **Early Old Irish** to the period from about the middle of the sixth to the end of the seventh century. Although there is some room for doubt about quite how early in this period manuscript texts began to be produced in the vernacular, the handful of contemporary or near-contemporary texts and glosses that constitute the only reasonably reliable witness to sound change at this time all belong almost certainly to the latter half of the seventh century. For present purposes, then, a 'prehistoric' first part accessible by historical inference alone is to be distinguished from a second part for which a limited amount of direct evidence is available. The obvious starting point is provided by a number of developments which logically postdate syncope but behind which the surviving written record does not reach.

1.2 Where apocope or syncope had left a nasal or a liquid unsupported after a consonant or between two consonants respectively, a support vowel /ə/ was normally developed in front of the resonant (*GOI* 70) and later coloured appropriately by the flanking consonants in accordance with 4.3 below: e.g., OIr. *domun* /doṽun/ 'world' < **doṽn* < **doṽna* < **duṽnah* < **dumnos*; *arathar* /arəθər/ 'plough' < **araθr* < **araθran* < **aratrom*; nom. sg. *bríathar* 'word, verb' < **brēθər* < **brēθr* < **brēθra* < **brētrā*, dat. sg. *bréithir* /brēθ´ər´/ < **brēθ´r´* < **brēθ´r´ĭ* < **brēθrī* < **brētrai*; *ebraid* < **evraθ´* 'will give' but *ebarthi* /evərθi/ 'will give it' < **evrθ´i* < **evraθ´i*; deut. *ad:gládathar* 'addresses' but prot. *-accaldathar* /agəldəθər/ < **-agəlðaθor* < **-aglðaθor* < **-aglaðaθor* < **-adglādātor*; *ingnad* 'wonderful' < **ingnaθ* but *ingantu* /ingəntu/ 'more wonderful' < **ingənθ´u* < **ingnθ´u* < **ingnaθ´ū* (< **an-gnāt-*). As can be seen from examples like *domun* above or Wb. *accobor*, *accobur* 'desire' < **akovr* < **akkovra(n)* < **ad + kuprom*, this /ə/ tended to be rounded in the vicinity of a labial. Anaptyxis did not apply to a nasal followed by a homorganic voiced stop as in *aisndís* 'narration' < **es´in´d´ew´isu* (IV.3.2; McCone, 1995, 131) or preceded by a liquid, another nasal or *d* as in OIr. *iarn* 'iron', *almsan* 'alms' (from Lat. *el(e)emosyna*), *ainm* 'name', *naidm* 'binding'. On the reasonable assumption that a case like dat. *bréithir* reflects

regular palatalisation of the whole cluster by *-ĭ prior to anaptyxis, examples such as gen. *arathair* /arəθər´/ 'of a plough', *domuin* /doṽun´/ 'of the world' will be due to well motivated replacement of **araithir* /arəθ´ər´/, **duimin* /duṽ´ən´/ < **araθ´r´ĭ*, **duṽ´n´ĭ* under paradigmatic pressure from the nom./acc. forms above.

1.3 Post-syncope sequences of non-nasal voiced consonant plus unvoiced fricative seem to have become voiceless throughout (*GOI* 80-1): e.g., *neph-chomt(h)etarracti* 'incomprehensible' (*neb-*), *deph†thigim* 'I contend' (*debuith* 'discord'), *prithchibes* 'who will preach' (Lat. *pr(a)edicare*), *ad:áich†fer* 'I shall fear', *ad:r-áich†setar* 'they have feared' (*ad:ágathar* 'fears'), *ainmmnich†the* 'named' (*ainmnigithir* 'names'), *a:trefea* 'will inhabit' < **aθ:tref´fa* < **að:trev´†fa* (*ad:treba* 'inhabits'), deut. *im(b):soí* but prot. *-impai* /impi/ 'turns' < **imphoy* < **imb†hoy* < **æmbi-how´ĭ* < **ambi-sowet(i)*, deut. *in(d):samlathar* 'imitates' but prot. *-intamlathar* < **inthavl-* < **ınd†hav†l-* < **ande-samal-* (see IV.3.5 on non-palatal *mp*, *nt* here), and probably *creit†fes* /kret´f´əs/ 'who will believe' (*creitid* /kred´əð´/ 'believes'), *léic†fimmi* /lēk´f´əm´i/ 'we will leave' (*léicid* /lēg´əð´/ 'leaves') etc. despite the failure of Old Irish orthography to distinguish between voiced and voiceless stops in this position.

Numerous Old Irish spellings fail to reflect this regressive assimilation: e.g., *neb-thórtrammad* 'non-pestering', *debthich* 'quarrelsome' (nom. pl.), *ad:ráig†setar*, *-ainmnig†ther* 'is named', *-ulemairb†fe* 'you will destroy utterly' (*marbaid* 'destroys'), *eirb†thi* 'entrusts himself' (*erbaid* 'entrusts'), *prid†chim* 'I preach'. It is uncertain whether retention of the form or stem found in corresponding forms before voiced segments in such cases (e.g. *neb-dénum* 'non-doing', *-pridach* 'I preached') was purely orthographical or at least sometimes due to analogical levelling reflected in actual pronunciation. Whichever of these factors was involved, the Old Irish Glosses certainly manifest considerable confusion both ways on the evidence of spellings like *neph-dligthich* 'irrational' (gen. sg.), *-prithach* 'I preached'.

1.4 When syncope brought homorganic consonants into contact (including *l, n, s* plus dental) any fricative(s) present were delenited: e.g., *-accaldathar* and *ingantu* in 1.2; *do:róscai* 'stands out' < **de rōsk†ki* < **de rōsk†x´i* < **de rōskox´ĭ* (prot. *-der†scaigi*); nom. pl. *Ulaid* 'Ulstermen' < **Uluθ´* < but acc. pl. *Ultu* < **Ul†θu* < **Uluθū*; *-mitter* 'is judged' < **miθ´†θor* (by 1.3) < **mið´†θor* < **meðiθor*; *benaid* 'strikes' < **benaθ´* but *bentai* 'strikes him' < **ben†θ´i* < **benaθ´i*; nom. sg. *césad* 'suffering' < **kēsaθ* but gen. sg. *césto* < **kēs†θo* < **kēsaθō*.

A few cases such as *cosaít* 'complaining' (vb. n. of *con:saídi*), *foít* 'sending' (vb. n. of *foídid*), *techt* (alongside normal *techtad*) 'possessing' (vb. n. of *techtaid*), *cruitt* 'harper' (arguably *crott* 'harp' plus agentive *-(a)ith* <

**-iyati-*) have been ascribed to sporadic syncope of an unstressed vowel in a final syllable between dentals at this stage (McCone, 1981, 40-1; see IV.1.2). However, *foít*, *techt* and the like could presumably be back-formations from regularly syncopated and delenited gen. sg. *foíteo* < **woiðĭθō*, *techto* < **textaθō* (Schrijver, 1992, 182-3), as can *cosaít* since, for whatever reason, it fails to syncopate the second syllable and then syncopates the third instead (cf. *cumacht†g-* in IV.5.1). This explanation by means of analogy will not apply to *cruitt* on account of **krottiyatōs* > **krut´e(y)aθōh* > **krut´†aθō* > gen. sg. **cruittedo* but, as Schrijver points out, this might simply have been an *i*-stem (*cruitt* < **krutih* < **krottis* vs. *crott* < **krottā*) from the beginning.

1.5 When a palatal and a non-palatal consonant came into direct contact as a result of syncope of the intervening vowel, this new group became palatal or non-palatal throughout by progressive assimilation to the quality of the first consonant. Thus pal. + non-pal. > pal. + pal. but non-pal. + pal. > non-pal. + non-pal.: e.g., OIr. *-mitter* (pal. *-tt-*) 'is judged' < **miðˊθor* < **miðˊĭθor*, *bentai* (non.pal. *-nt-*) < **benθ´i* < **benaθ´i*, deut. *for:cenna* 'terminates' (pal. *c*, non-pal. *n(n)*) vs. prot. *-foircnea* (pal. *-rcn-*) < **worˊkˊNa* < **worˊkˊĭNa* and deut. *fo:gaibet* (non-pal. *g*, pal. *b*) 'they find' vs. prot. *-fogbat* (non-pal. *-gb-*) < **woγvˊod* < **woγavˊeod*.

Greene's claim that 'a few archaic spellings like *coicsath*, for later *coicsed*, show the older state of affairs' (1973, 134-5) before the progressive assimilation to (in this case) palatal quality throughout would entail a date around the mid-seventh century for this development, since this and other examples such as *tu:esmot* 'who shed' (later *do:esmet*) are from the Cambrai Homily. However, *ad:rímther* 'is reckoned' presumably represents /rīṽ´θ´ər/ < **rīṽ´θor* in the same text, where partial retention of the original quality of unstressed internal vowels (4.3) raises the possibility that *coicsath* and *tu:esmot* reflect assimilated /kog´s´aθ/, /tu es´ṽ´od/ without orthographic indication of the palatal off-glide (I.6.7) rather than unassimilated /kog´saθ/ (or even /kog´səθ/), /tu es´ṽod/. Consequently an earlier post-syncope date can hardly be excluded.

1.6 The gap in the stop system produced by Proto-Celtic loss of *p* was initially filled in Primitive Irish by loanwords like OIr. *penn* 'pen' < Lat. *penna* (III.1.4; McManus, 1983, 36-40 and 48), a new voiceless *p* corresponding to voiced *b* being admitted on the pattern of the relationship between inherited *t* and *d*, $k^{(w)}$ and $g^{(w)}$. A similar use of loanwords to fill out gaps (e.g. new *b* to existing *p* on the model of *d/t*, *g/k*) in the inherited system of a Southern Pacific language has been described by Lenormand: 'It is clear that Lifu speakers have managed to reproduce such foreign phonemes as somehow filled the 'gaps' in the pattern. This is easily understandable if one realizes that a 'gap' in the pattern means that a combination of two articulations, each of

which was widely used in the language, is not made use of for distinctive purposes. It will certainly be easier for the speakers of that language to combine two existing articulations than to reproduce a totally strange one' (1952, 256).

A new 'native' *-p-* later arose internally after syncope in Irish because *-h-* (< *-s-*) resisted otherwise general intervocalic loss some time before the first palatalisation (2.3) at the beginning of a word, including the root of compound verbs (III.1.4) or a pronoun suffixed to a preposition. After syncope this *-h-* devoiced any voiced consonant in contact with it by 1.3 before disappearing everywhere except in postvocalic anlaut, where it has survived right down to Modern Irish: e.g., OIr. *a śíl* /a hīl/ 'his seed/offspring' vs. gen. sg. *int śacairt* /ɪNt agəʀ´d´/ 'the priest's' (ModIr. *an tsagairt* /ən tagəʀ´t´/) < **ind hagaʀ´d´* < **indi hagardi*; OIr. *a ech* /a hex/ 'her horse' (ModIr. *a heach*) < **eā hexʷa* < **eyāh exʷah* vs. *int ech* /ɪNt ex/ 'the horse' (ModIr. *an t-each*) < **ind hex* < **inda hexʷa* < **indah exʷah* (IV.4.2); deut. *do:sluindi* 'denies' vs. prot. *-dílltai* /dīLti/ (ModIr. *diúltaíonn*) < **dīhʟnti* < **dī-hʟᵗn´d´i* < **dī-hʟon´d´ī* < **dī-slondīt(i)* (see 4.4 on *lnd/t* > *ld/t*); *impu* 'around them' < **ɪmbᵗhū* < **æmbi-hūh* < **-sūs* and also *-impai*, *-intamlathar* in 1.3 above.

2.1 SEMIVOWELS AND DIPHTHONGS. Stressed *i* (< *i* or *e* by IV.1.5) in hiatus before *a/o* was regularly lowered to *e* by IV.2.1(c) but then raised to *i* again in hiatus after syncope: e.g., subj. 3 pl. rel. *crete* < **kʳ´eᵗd´e* < **kʳ´ead´e* < **kriy-ad´iya* < **krey-āsonti-yo* (*crenaid* 'buys') vs. 3pl. conj. *-criat*; nom. sg. *scé* 'whitethorn' < **ske* < **skʷeya* < **skʷiy-as* vs. gen. *sciad* < **skʲeaθ* < **skʷʲeaθa* < **skʷiy-at-os* (MW *yspydat*) and probably nom. sg. *biáil* 'axe' vs. gen. *béla* (IV.5.1).

2.2 It has been seen (IV.4.1) that *w* became *v* after a voiced consonant before the loss of final *-n*, while merger of *h* plus *w* as *f* (chrono)logically precedes the general loss of postvocalic *h* (2.3), a rather early date supported by the substitution of *s(w)-* for (at this stage lenited only < **hw*) *f-* in some old Latin loanwords such as OIr. *sroigell* 'whip' < Lat. *flagellum* (McManus. 1983, 51-6). Both /f/ and /v/ (written *f/ph* and *b*) then remained unaltered throughout the Old (and Middle) Irish period. Notwithstanding Russell's blithe assertion that 'the final stages of the change of **-sw-* > **-hw-* > *-f-* are relatively late within Primitive Irish at a point when internal *w* would already have disappeared' (*JCeltLing* 2, 1993, 166), the likes of Og. (gen.) CUNOVALI (MW *Cynwal*), EOIr. *Conual* and OIr. *Conall* demonstrate the survival of unmodified *w* until after syncope and its retention after a consonant right down to the seventh century, whereas logic dictates that *hw* had become *f* not just before loss of 'internal *w*' in *Conual* etc. but actually some time before the apocope of c. 500 A.D.

Before a consonant or in absolute auslaut non-palatal *w* coalesced with a preceding stressed vowel to form a diphthong: e.g., OIr. *Éogan* < **Ewᵗɣen* < **Ewaɣena* < **Iwaɣenah* (Og. gen. IVAGENI) < **Iwo-genos*; EOIr. gen. sg. *bou* (probably = *bóu*) 'cow' < **bow* < **bow-os*; OIr. nom. sg. *béo* 'alive' < **bew* < **bewah* < **biwos* but pl. *bí* < **biy* < **biwʲ´ī* < **biwī*, gen. *aisndísen* < **esᵗɴdiyᵗs´on* < **essæɴdew´issonah* (preferable to McCone, 1995, 131) < **-s(i)yonah* (1.2; IV.3.2). Palatal *w* also survived the syncope, whereupon it was lost before a vowel but became *y* at the end of a word or before a consonant (cf. Toch. A *want* but B *yente* 'wind' < **wēntos*). This *y* also coalesced with a preceding vowel: e.g., OIr. *bí*, *aisndísen*, *oac* 'young' < **oweg* < **yowænkos* vs. *óitiu* 'youth' < **oyd´u* < **owᵗd´u* < **yowʲdu* < **yowæn-tūs* (cf. Lat. *iuventus*); OIr. *oí* 'sheep' < **oy* < **ow´* < **owʲ´ī* < **owih* (non-raising of *o* over *w* by *i* here as opposed to *iy* in *nu(i)e* below or *bue* in IV.2.4; cf. *daig* vs. *lige* in IV.2.2) < PC **owis* < PIE **$h_2$ow-i-s* (Lat. *ovis* etc.); OIr. *druí* 'druid' < **druy* < **druw´* < **druwʲ´ī* < **druwi(d)-s*. It appears from Wb. *nuie* 'new' < **nuye* < **nuwʲ´eya* < (raising by *iy*) **nowiyah* < IE **new-yo-s* (Skt. *navyas*, OE *nēowe*) that *y* < *w´* made a diphthong with *u* before *-e* but Ml.and Sg. *nu(a)e* indicate that this *i* was soon lost within the Old Irish period. The above follows Cowgill's (1967) perceptive treatment of the fate of *w* in Primitive and Early Old Irish in positing these basic developments prior to the general post-syncope loss of any *w* that had neither been changed to *f* or *v* nor combined with a preceding vowel into a diphthong (now see further Uhlich, 1995): e.g., *Conual* > *Conall* above .

A peculiar development *w-* > *f-* confined to unlenited initial position before the loss of unmodified *w* is a rather unattractive way of accounting for the likes of OIr. *fer* 'man' < **wer* < **werah* < **wiros*. It seems more likely (following Watkins, 1966, 70-1) that the anomalous patterning seen in nom. sg. **wer* 'man' vs. *in fer* 'the man' (< **inda fera* < **indah wirah*), gen. sg. *ind fir* /irʲ/ 'the man's' and pl. *inna fer* /ver/ 'the men's' (< **indan veran*; *w* > *v* after a voiced consonant) and so on in anlaut was tending to be replaced by nom. sg. *fer/in fer* etc. under analogical pressure from the normal alternations seen in a case like nom. sg. *corp* 'body', *in corp* 'the body', gen. sg. *in choirp* 'the body's', gen. pl. *inna corp* /gorp/ 'the bodies''. Variants such as **wer/fer* could then have triggered uninflected doublets like **wor/for* (OIr. *for* 'on'), **wo/fo* (OIr. *fo* 'under') before *f-* triumphed throughout.

2.3 Although *-oi* and *-ai* were monophthongised to *-ī* quite early (III.5.7), new final *i*-diphthongs arose as a result of the loss of *h* (< *s*) between vowels: e.g., the verbal endings **-asi* (S3 2 sg. abs. pres.), **-mosi* (1 pl. abs.), **-mosi-yo* (1 pl. rel.), **-āsisi*/**-āsis* (2 sg. *a*-subj. abs./conj.) > **-ahi*, **-mohi*, **-mohiya*, **-āhihi*, **-āhih* > **-ai*, **-moi*, **-moiya*, **-āiyi*, **-āi* respectively. The palatal *-m(m)-* of OIr. 1 pl. *-aimmi* < **-omʲ´ī* (replacing **-oṽī* under the copula's influence) shows that monophthongisation of *-ai*, *-oi* to *-ī* here

occurred after the shortening of long vowels in IV.2.1(a) but before the first palatalisation between IV.2.1(b) and (c). Thereafter *-āi* was shortened to *-ai*, whence 2 sg. *ā*-subj. > **-aiyi*, **-ai*, and this new *-ai* was still a diphthong when the apocope produced further instances of *-ai/-oi*: e.g., 1 pl. rel. **-moi* < **moiya*, 2 sg. abs. subj. **-ai* < **-aiyi*, **-boi/*-rovoi* 'was/has been' < **boy* < **bow´ɣ* < **bowe* (2.2). This 'third generation' post-apocope *-ai/-oi* was monophthongised to *-ē* in unstressed syllables: e.g., OIr. *ro:boí* 'has been' < (stressed) **-boy* < **bow´ɣ* < **bowe* vs. *ní:ra-bae* 'has not been' < **-vē* < (unstressed) **-voy* < **-vow´ɣ* (OIr. *-impai* 'turns' for **-impae* < **-impē* < **-imb†hoy* < **imbi-how´ɣ* owing to analogical pressure from *-léici* 'lets', *-accai* 'sees' etc.); OIr. 1 pl. rel. *-aimme* /-əm´e/ (palatal *m* on the analogy of abs. 'sees' etc.); OIr. 1 pl. rel. *-aimme* /-əm´e/ (palatal *m* on the analogy of abs. *-aimmi* above) < **-omē* < **-omoi* (or **-oṽoi*); 2 sg. subj. *berae* /bere/ < **berē* < **berai* (cf. McCone, 1982, 25-6); *gáe* /gai/ 'spear' < **gay* < **gaya* < **gaihah* < **gaisos* vs. *foga(e)* /foɣe/ 'small spear' < **woɣē* < **woɣay* etc.; *senchae* 'custodian of tradition' < **seno-xē* < **seno-x^{w}oya* < **seno-x^{w}oih(y)ah* < **seno-k^{w}oisos* 'ancient seer' (McCone, 1995b).

2.4 It thus appears that the shortening of unstressed final vowels seen in OIr. gen. sg. *dego* 'of flame' < **deɣō* < **deɣ^{w}ōh* (IV.), *-marba* 'kills' < **-marvā* < **marw-āh* (< **-āθ* < **-āt(i)* etc. took place after this monophthongisation of tertiary *-ai* to *-ē* (> OIr. *-e*). On the other hand, a short stressed vowel or the first element of a *u*-diphthong was lengthened in absolute final position: e.g., OIr. *me-sse* 'I/me' (emphatic) vs. *mé* 'I/me' < **me*; *tu-ssu* 'you' (sg., emphatic) vs. *tú* 'you' (sg.) < **tu*; 3 sg. abs. *s*-subj. *geis* 'may pray' < **ges´* < **g^{w}essi* vs. conj. *-gé* < **-ge* < **g^{w}eh* < **g^{w}ess*; 3 sg. abs. pres. *baid* 'dies' < **baeθi* vs. conj. *-bá* < **-ba* < **baeθ*. The upshot was lack of phonemic length in final vowels, since the feature [±length] was complementarily distributed in this environment: final vowels were automatically long under the stress but otherwise short.

3.1 VOICING OF CONSONANTS. The most significant development in the consonant system between the Early Old Irish of the seventh and the (Classical) Old Irish of the eighth and ninth centuries was the voicing of dentals on the word boundary (including the boundary between a proclitic and the stressed word following it) next to an unstressed vowel (McCone, 1981). This resulted in word-final [θ] > [ð] (spelt *-th* and *-d*) after an unstressed vowel and in [t] > [d] at the beginning of a proclitic (*t-* > *d-* orthographically) or at the end of a word (where it was still spelt *-t* in accordance with I.6.6) after an unstressed vowel. Thus EOIr. *ro:slogeth* (Wb. 13^{a}24 *prima manus*) vs. OIr. *ro:slocad* 'has been swallowed', EOIr. subj. *gorith* (Cambrai) vs. OIr. *gor(a)id* 'may warm', EOIr. *díltuh* (Wb. 6^{c}2 *prima manus* and Cambrai) vs. OIr. *díltud* 'denial', EOIr. 3pl. *tu:esmot* (Cambrai) vs. OIr. *do:esmet* 'who spill'. Although

Lat. *sagitta* must have been borrowed into Irish as /saɣ´it/, Modern Irish *saighead* 'arrow' leaves little doubt that OIr. *saiget* 'arrow' was actually pronounced /saɣ´əd/ as a consequence of the voicing of final [t]. This sound law accounts for numerous grammatical alternations in Old Irish such as those between deut. *do:beir* 'brings' (*t-* > *d-* before proclitic vowel) and prot. *-tabair* (*t-* unchanged before stressed vowel), deut. *do:gníth* 'was done' (*-th* unchanged after stressed vowel) and prot. *-dénad* < **-deɣniθ* (*-th* voiced to *-d* after unstressed vowel), deut. *ad:géuin* 'recognised' (*-th* > *-d* after proclitic vowel) and prot. *-aithgéuin* (unaltered *-th-* after stressed vowel), nom. sg. *lepuid* 'bed' and gen. sg. *leptho* or *beirid* 'carries' and *beirthi* 'carries it' (final *-th* > *-d* after unstressed vowel and unaltered internal postconsonantal *-th-* respectively).

A late seventh-century date for this voicing is indicated by the fact that the Cambrai Homily consistently ignores it and the Würzburg *prima manus* of about 700 A.D. has only one clear instance of *-d* in pl. *dilgid* 'forgive!' as opposed to several of *-th* or proclitic *tu-/to-* (OIr. *du-/do-*).

3.2 There was also a marked tendency to voice a dental fricative between unstressed vowels, [θ] > [ð] here being responsible for Old Irish doublets such as *-comalnathar* (Wb. 31^{c}14) or *-comalnadar* (15^{b}14) 'fulfils' as well as alternations such as that between *-cruthaigedar* 'forms' (Ml. 140^{b}5) and syncopated *-cruthaigther* 'is formed' (cf. *lebuid*, *leptho*), EOIr. *-étatham* 'we will obtain' (Cambrai; cf. Wb. *prima manus* 21^{a}4 *siglithi* glossing Lat. *signati*) and OIr. *-étada* 'will obtain' (Ml. 129^{b}5). The evidence suggests an early eighth-century date for this intervocalic voicing, whence the considerably higher frequency of conservative *-th-* spellings here in eighth- and ninth-century sources than is found in the case of final *-th/-d* after an unstressed vowel.

3.3 Voicing of *f* to /v/ written *b* occurred under virtually identical conditions to those just described in 3.1-2: e.g., *-solfea* 'will turn' (retention after stressed vowel), *-léicfea* 'will let' (retention after consonant) vs. *-léiciub* 'I will let' (regular voicing in auslaut after unstressed vowel) and *-pridchabat* 'they will preach' or *-comalnabadar* 'will fulfil' (voicing between unstressed vowels) alongside conservatively spelt *-élafae* 'you will escape'. As Peter Schrijver points out to me, OIr. *feb* 'excellence, worth' < **wefa* < **wehwā* < **weswā* indicates that this particular voicing was general in final position, even after a stressed vowel.

3.4 Voicing of the palatal velar /-x´/ to /-ɣ´/, spelt *-ch* and *-g* respectively, at the end of the word after an unstressed vowel or between unstressed vowels apparently occurred in tandem with the similar developments above in the dentals and labials. Hence EOIr. nom. pl. *dásachtaich* (Wb. 19^{b}3, *prima manus*) vs. OIr. *dásachtaig* 'madmen' (nom. sg. *dásachtach* with unaltered non-palatal *-ch*) and Old Irish morphophonemic alternations of the type nom. sg./gen. pl. *pecthach* '(of) sinner(s)', gen. sg./nom. pl. *pecthaig* (also spelt

pecthich Ml. 57^{d}1) or adj. (nom. sg.) *sóinmech* 'prosperous', abstract noun *sóinmiche* or *sóinmige* (cf. *-athar* or *-adar* in 3.2).

Such was the centrality of alternations between broad and slender consonance to various Old Irish inflectional and derivational processes, especially in the nominal system, that this patterning became productive with the result that broad *-ch* /-x/ might replace original broad *-g* /-ɣ/ in paradigmatic alternation with slender *-g(-)* /ɣ´/ by analogy (see Penny, 1991, 84-6 for a similar acquisition of an unlenited variant [b] by [v] in Spanish on the analogy of original [b] with its lenited variant [v]). Despite the problem of the preceding stressed vowel (perhaps compounds like *rígthech* 'palace' for *-theg* provided the trigger), a probable example is replacement of the original NVA sg. *teg* 'house' (cf. Gk. *(σ)τέγος* 'roof', Lat. *teg-* 'cover') still surviving in Wb. 23^{b}8 (*prima manus*) by *tech* alternating with gen. *tige*, dat. *t(a)ig* in Old Irish.

3.5 After *r*, *l*, *n* or (unlenited) *m* and an unstressed vowel final *n* /n/ and *l* /l/ were strengthened to *n(n)* /N/ and *l(l)* /L/ in accordance with MacNeill's Law (see Hamp, 1974): e.g., OIr. nom. pl. *anman(n)* 'names', *céim(m)en(n)* 'steps' < **anmen*, **kĕmmen* < **anmena* (cf. OW *enuein*; Gaul. *anuana*), **kanxsmena* (cf. OW *cemmein*); *lán* 'full' but *comlann* 'complete' < **kov-lan* (< **kov-lān-ah*; 6.2a), *Caulann* < **kaulon* (IV.1.3).

4.1 BREAKING, PROCLISIS AND UNSTRESSED VOWELS. Contrasts such as those between EOIr. *Neel* /nēl/ (Tírechán; see I.3.2) or gen. sg. *fédot* (Cambrai) and OIr. *Níal(l)* 'Niall', *fíadat* 'of a lord' show that, unlike the mid low *é* /ē/ due to compensatory lengthening (e.g., OIr. *cét* 'hundred' and *én* 'bird'; IV.1.3 and 5.1), old mid high *é* /ē/ underwent breaking to a diphthong *ía* before a non-palatal consonant around the end of the seventh century. This development is responsible for plentiful Old and Modern Irish grammatical alternations of the type nom. sg. *ciall* 'sense', *grían* 'sun' but gen. sg. *céille*, *gréine* (/ē/ before non-palatal and palatal consonant respectively).

Even though the precise conditions responsible have not been established (*GOI* 39-41), *úa* often replaces *ó* in Old Irish: e.g., nom. sg. *túath* 'tribe' < **tōθ*, gen. sg. *túaithe* < **tōθ´e*, nom. sg. *slóg* or *slúag* 'host', gen. sg. *slóig* or *slúaig*. A comparison between EOIr. *ood* (= *ód*), *ōnni* (Cambrai) and OIr. *(h)úad* 'from him', *(h)ónni* or *(h)úanni* 'from us' indicates that this development too originated around the end of the seventh century. It would be tempting to suppose that this breaking, like that of *é* to *ía*, originally occurred before a non-palatal consonant but, if so, there had already been considerable analogical confusion both ways by the time of Old Irish.

4.2 It is clear from the sources that the seventh century witnessed a number of changes peculiar to proclitic elements such as conjunctions, conjunct particles, pretonic preverbs, prepositions, possessive pronouns and the copula.

Voicing of *t-* to *d-* before the unstressed vowel of a proclitic has already been covered (3.1). Further important developments confined to proclitics were depalatalisation of consonants and a corresponding retraction of *u*, *e* to *o*, *a* respectively: e.g., EOIr. *amail* /aṽal´/ (Wb. 21^{c}10, 22^{c}24 *prima manus*) but OIr. *amal* /aṽəl/ 'as, like'; EOIr. *ocuis* /ogus´/ (Cambrai) but OIr. *ocus* /ogus/ 'and'; EOIr. *ine lāim* /in´e/ (Cambrai) but OIr. *ina láim* /ina/ 'in his hand'; EOIr. *le* [l´e] (Cambrai) but OIr. *la* [la] 'with'; EOIr. *óire nu-ndem* (Cambrai) but OIr. *(h)óre/(h)úare no-ndan* 'because we are'. Both voicing of *t-* and depalatalisation of *-m* can be seen in the OIr. preposition *dochum* 'towards', a proclitic version of *tochim* 'stepping towards' (verbal noun of *do:cing*). It is probable that *u*-spellings such as *dochum*, *ocus*, *du* and so on still found in Old Irish sources simply reflect the possibility of spelling the single rounded vowel phoneme resulting from the neutralisation of the distinction between high back /u/ and mid back /o/ in proclisis as *o* or *u*. Retraction of proclitic *e* accounts for grammatical alternations such as that between deut. *as:beir* 'says' and prot. *-epir* (stressed *e* unaffected by retraction).

Nevertheless, alongside examples such as the above with palatal consonants and unretracted vowels in proclisis the Cambrai Homily also contains examples of the depalatalisation and retraction typical of 'Classical' Old Irish: e.g., *ocus* beside *ocuis*, *ara* /ara/ beside *are* /ar´e/ 'so that', 3 pl. rel. *ata* /ada/ of the copula (McCone, 1995). It seems, then, that both of these processes had affected the spoken language before the composition of this homily, probably in the second half of the seventh century, but that the written language was a little slow in recognising them at first.

4.3 The same applies to non-final unstressed *a*, *e*, *i* and *o*, which had merged as mid central 'schwa' /ə/ before a consonant by the time of Old Irish. This 'schwa' phoneme was then written in various ways in order to indicate the quality of the flanking consonants (I.6.7), most likely because colouring by these had endowed /ə/ with several allophones. It was thus written *a* (= [a]?) between two non-palatal consonants, *i* (= [i]?) between two palatal consonants or a non-palatal and a palatal consonant (= [ɪ]?; in this case it was optionally written *ai* to indicate the non-palatal status of the preceding consonant) and *e* (= [e]?) between a palatal and a non-palatal consonant. In hiatus after *i* (2.1) /ə/ was represented as *a* (= [a]?) before a non-palatal but as *ei* or *i* (= [e], [i]?) before a palatal consonant, the former apparently being preferred before *r´* and *ɣ´* at least: e.g., OIr. sg. acc. *sieir* /siər´/ 'sister' < **s´ior´* < **s´eor´* < **swehor-en* < **swesor-æn*; nom. *lieig* /liəɣ´/ 'leech, doctor' < **ʟ´iaɣ´* < **Leaɣ´ɣ* < **-is* (but gen. *lego* < **ʟ´e^{h}ɣo* < **-ōs* and *leiges* 'cure' < **ʟ´e^{h}ɣ´-es* < **-issos*); pres. 3sg. abs. *biid* /biəð´/ 'is wont to be' < **bieθ´*, 3pl. abs. *biit* /biəd´/, conj. *-biat* /biəd/ 'are wont to be' < **biod´*, **biod*, 3sg. fut. abs. *bieid* 'will be' /biəð´/ < **biaθ´* < **biāθi* (conj. *-bia* /bia/ < **biāh*),

sg. acc. *liic* /liək´/ 'stone', gen. *liac* /liək/ < **li(y)akk-* (?; nom. sg. *lie* < **liah* < **liyaxs*?).

There are a number of examples of this new system in Cambrai alongside examples of the old system prior to merger: e.g., 1 pl. (pres.) *ar:foímam* 'we receive', (*s*-subj.) *fris:tóssam* 'we may refuse' < **-oṽ* < **-o-mos*, 3 sg. pres. pass. *ad:rímther* 'is reckoned' < **ad:rímthor* < **að RĪṼ´[ĭ]θor*. Nevertheless, the following fine examples of the pre-merger state of affairs indicate that this crucial development had not taken place long before the composition of the homily: 3 pl. rel. pres. *tu:esmot* 'who spill', *tu:thégot* 'who come', 3sg. pret. *aut:rubert* 'said it', *saíthor* 'work', gen. sg. *fēdot* 'lord's' (Cambrai) and *ro:slogeth* 'has been swallowed' (Wb. *prima manus*) corresponding to Classical Old Irish *do:esmet* /do es´ṽ´əd/, *do:thíagat* /do θiaɣəd/, *at:rubart* /ad ruvərt/, *saíthar* /saiθər/, *fíadat* /fiaðəd/ and *ro:slocad* /ro slogəð/.

This post-syncope alteration of internal unstressed vowels around the middle of the seventh century is responsible for plentiful paradigmatic alternations in Old Irish such as those between deut. *do:beir* 'gives' and prot. *-tab(a)ir* /tavər´/ (< **taver´*), pret. *as:bert* 'said' and perfect *as:rubart* /as Ruvərt/ 'has said' (< *-rubert*), deut. *fo:gaibet* /fo gav´əd/ 'they find' and prot. *-fogbat* /foɣvəd/ or deut. *for:cennat* /for k´eNəd/ 'they finish' and prot. *-foircnet* /for´k´n´əd/ (*GOI* 75).

This development not only reduced a fivefold phonemic opposition among short unstressed preconsonantal vowels to a twofold one between /ə/ and /u/ (e.g., *as:ruburt* /as Ruvurt/ 'I have said' vs. *as:rubart* /as Ruvərt/ 'he has said' or dat. sg. *formut* /formud/ vs. nom./acc. sg. *format* /forməd/ 'jealousy'), but also significantly extended the phonemic status of palatalisation versus non-palatalisation of internal single consonants by eradicating originally crucial conditioning distinctions between the non-final unstressed vowels following them. For example, before this stage the phonemic distinction between 3sg. abs. pres. [b´er´eθ´] and subj. [b´eraθ´] could be stated in terms of the post-consonantal vowels as /bereθ´/ vs. /beraθ´/, whereas after it only the palatal versus non-palatal internal consonant was phonemically relevant in /ber´əθ´/ (OIr. *be(i)rid*) vs. /berəθ´/ (OIr. *ber(a)id*).

Prior to lowering and apocope palatalisation was a purely allophonic feature, the distribution of which was determined by the quality of flanking vowels. As a consequence of the apocope and syncope above all, palatalisation of consonants attained major phonemic status in the course of the first half or so of the sixth century but the five basic short vowel articulations also retained their phonemic relevance in all environments. The vital seventh-century developments just documented created a further major phonemic shift away from the quality of vowels to that of consonants not only by expanding the incidence of phonemic palatalisation of consonants but also and even more importantly by making any differences between a range of short unstressed vowels into a mere

allophonic concomitant of the quality of the flanking consonants. Only stressed vowels and unstressed final vowels retained a fivefold phonemic distinction between /a/, /e/, /i/, /o/ and /u/. As a result of syncope, loss of *y* etc. phonemic distinctions of consonant quality had already come into being before final unstressed *-a, -e, -i, -o, -u* and the only point in the system where the opposition between non-palatal and palatal consonants had not yet attained phonemic status was at the beginning of a word, i.e. before a stressed vowel.

4.4 As a comparison between OIr. *álaind* 'beautiful' < **ālINdih* and comparative *áildiu* 'more beautiful' < **āl´ᵗN´d´u* < **ālINdiyūh* shows, *n* was lost between *l* and a stop at some time between the operation of syncope (cf. *-díltai* in 1.6) and the approximately late-seventh-century Cambrai Homily (*dilluth* 'denial').

5.1 CHANGES IN THE OLD IRISH PHONEMIC SYSTEM. The foregoing considerations imply the inventory of consonant phonemes ascribed in I.6.1 to the beginning of the Old Irish period. This system remained virtually unchanged throughout the Old and Middle Irish periods. By and large, fricatives arose from the corresponding stops by up to three successive waves of lenition (III.4.1-4). Since /p/ inherited from Proto-Indo-European had been changed to /x/ etc. or lost before the end of the Proto-Celtic period (II.1.5), there was originally no /p/ in Primitive Irish to lenite to /f/. Even when this gap in the system had been filled with the help of loans from Latin from the later fifth century A.D. onwards (1.6), there was reluctance to lenite *p-* in the absence of an inherited native pattern for this, whence OIr. *tech* 'house', *mo thech* 'my house' etc. but normally *popul* /pobul/ 'people' (< Lat. *populus*), *mo popul* (cf. Ml. 77ᵃ12) 'my people'. Gradually, however, *p-* began to be lenited to *ph-* /*f-* on the analogy of the system seen with *t-*, *c-* vs. lenited *th-*, *ch-*, whence occasional examples like voc. sg. *a phopul* 'o people' (Wb. 33ᵃ15). The chief source of OIr. *f* was thus *hw* and *w-* (IV.4.1). The rise of palatal phonemes (indicated by ´) has already been dealt with (4.5 above and IV.3.1-5), as has the opposition between tense or unlenited /N/, /R/, /L/ and lax or lenited /n/, /ɾ/, /l/. The phoneme /h/ had only marginal sub-lexical status, occurring in Old Irish merely as a mutation of an initial vowel or *s-* in certain circumstances: e.g., OIr. *ní (h)ed* /nī heð/ 'it is not' (ModIr. *ní hea*) < **nīh eð* (< **nīs..* < **nēsti..* < **ne esti..*), *a (h)ech* /a hex/ 'her horse' (ModIr *a heach*) < **eāh ex* (< **esyās ekwos*) or *a śét* /a hēd/ 'his path' < **ea hēduh* (< **esyo sɪntus*). Since palatalisation of initial consonants was still non-phonemic (4.3), *h-* did not yet have a phonemic palatal counterpart.

5.2 The basic vowel phonemes were /a/, /e/, /i/, /o/, /u/ and their long counterparts /ā/, /ē/, /ī/, /ō/, /ū/. The OIr. variants *-moinethar*, *-muinethar* beside rarer *-mainethar* < **manyetor* < **mŋ-ye-tor* testify to a tendency to

round stressed *a* between labial *m* and palatal *n* at least. The contrast between /a/, /e/, /i/ and /o/ had been neutralised as /ə/ in unstressed syllables before a consonant by 4.3. The straightforward contrast between mid high /ē/ and mid low /ɛ̄/ (see IV.5.1) before a non-palatal consonant had been eradicated by 4.1. and there is no evidence that a phonemic distinction between mid high /ō/ and mid low /ɔ̄/ had survived either.

5.3 The Old Irish diphthongs have been subjected to a detailed investigation by Greene (1976). The only diphthongs inherited from Proto- via Insular Celtic into Primitive Irish would seem to have been *ai* and *oi*, which are the only ones found on Ogam inscriptions (McManus, 1991, 121) and duly survived down to the Old Irish period: e.g., Og. MAILAGNI, OIr. *maíl/máel* 'bald' < **mailo-* (OW *mail*, MW *moel*), Og. COIMAGNI, OIr. *coím/cóem* 'fair' < **koimo-* (OB *-cum*, MW *ku*). Further instances of these arose as a result of various Primitive Irish developments (e.g. IV.5.2) and *ui* was added to them as a result of *-w´* > *-y*: e.g., OIr. *druí* 'druid' < **druy* < **druw´* etc. in 2.2.

New *au*, *iu*, *eu* and *ou* diphthongs were created by *u*-affection (IV.2.3) and by the merger of word- or syllable-final *w* with a preceding vowel as in 2.2 above. The corresponding long diphthongs *áu*, *íu*, *éu* and *óu* were also the product of two separate developments. Firstly there was compensated loss of certain fricatives before a nasal or liquid (IV.5.1), as in gen. sg. **k´en´eθ´l´* > **k´en´ēul´* (OIr. *cenéuil/cenúil*) and dat. sg. (**kenɛθlu* >) **k´en´euθl* > **k´en´ēul* (OIr. *cenéul/cenúl*), and secondly there was lengthening of the first part of a stressed final diphthong (2.4), as in *bóu* and *béo* in 2.2 above, 1 sg. pres. *-bíu* 'I am wont to be' < **biu* < **biuyu* < **biyu* < **biyū*, *a:táu* 'I am' < **tau* < **ta-u* < **ta-ū*, subj. *-béu/-béo* 'I may be' < **beu* < **be-u* < **be-ū*. The late seventh-century breaking of *é* and *ó* responsible for the diphthongs *ía* and *úa* has been described in 4.1.

It seems that *ou* and *óu* did not outlive the Early Old Irish period. To begin with, *u*-affection often failed to apply to *o* for the simple reason that this had already been raised to *u* by IV.2.1(a), as in nom. sg. *locc* 'place' < **Logah* (< Lat. *locus*) vs. dat. sg. *lucc* < **Lugu* < **Lugū* < **Logū*. This *o/u* pattern apparently ousted the unraised type with nom. sg. *roth* 'wheel' and dat. sg. EOIr. *routh* early, whence OIr. *ruth* and so on. As for *óu*, it had merged with *áu* before the end of the seventh century on the evidence of a case like EOIr. gen. sg. *bóu* 'cow's' < **bow* < **bow-os* vs. OIr. gen. pl. *báu/báo* 'cows'' < **bow* < **bow-om* (McCone, 1991c). Hence the Old Irish inventory:

/ai/	/oi/	/ui/
/au/	/eu/	/iu/
/āu/	/ēu/	/īu/
/ia/	/ua/	

5.4 The number of diphthong phonemes was evidently on the wane in the course of the Old Irish period. Confusion of /ai/ and /oi/ is found as early as *maídem* (Wb. 17c14) 'boasting' alongside normal *moídem* (Wb. 17c11 etc.). Indeed, Peter Schrijver has reminded me of a surprisingly earlier instance in Ogam (McManus, 1991, 121), namely VRAICCI (Sg. *froích* 'of heather') < **wroikī* (MW *gruc*). Old Irish sources also show a marked tendency to monophthongise *au* to *u* and *áu* to *ó*, as in acc. pl. *baullu* or *bullu* 'members' (Wb. 3b26 and 9d4 respectively), 1 sg. *for:chun* 'which I teach' (Wb. 10a13) for **for:chaun*, *-táu* (Wb. 32a10) and *at:tó* (Wb. 21c19 etc.) 'I am' and so on.

Notwithstanding alternations such as *cenéuil/cenúil* above, *éo/éu* and *íu* resisted confusion when grammatical distinctions such as nom. sg. *béo* 'alive' vs. dat. sg. *bíu* or 1 sg. *-bíu* 'I am wont to be' vs. subj. *-béu/-béo* 'I may be' were involved. It is to be noted that either *u* or *o* could represent the second element of the diphthongs /āu/, /ēu/ orthographically and that in the second of these the syllable centre may already have been shifting in the Old Irish period to produce /ō/ between two palatal consonants, a process probably more or less complete in Middle Irish: e.g., nom. pl. *beóil* 'lips, mouth' (Wb. 7d9; /b´ōl´/?) or gen. sg. *a cheneóil* 'of his race' (Wb. 6d6; /xen´ōl´/?). This at best very limited occurrence of C´- before a stressed back vowel would have marked the barest beginning of a phonemic opposition between non-palatal and palatal initial consonants within Old Irish itself. In addition, alternations such as that between nom. sg. *fis* /fis/ (Ml. 46c24) and *fius* /fius/ 'knowledge' (Wb. 10b27 etc.) or dat. sg. *ar chinn* /xiN/ (Wb. 2a9 etc.) and *ar chiunn* /xiuN/ 'in front of, awaiting' (Wb. 2a9 etc.) testify to an Old Irish tendency to simplify *iu* to *i* (plus non-palatal on-glide phonetically). Both this and the previous shift of syllable centre prefigure major Middle Irish developments to be discussed below.

The upshot of all of this is that the Old Irish period witnessed significant progress towards a reduction from the eleven phonemic diphthongs in 5.3 to a mere five: /ai/, /ui/, /eu/, /ia/, /ua/.

5.5 No significant change affected the vowel system during the Old Irish period except that final unstressed *-o* and *-a* began to merge as *-a* quite early with the result that the short vowel phonemes in this environment were reduced from five to four: e.g., *u*-stem gen. sg. *betho* 'of (the) world', *gnímo* 'of a deed' mostly in Wb. alongside examples of *betha* (Wb. 15d9) and *gníma* (Wb. 6a11), the normal forms from Ml. onwards. In view of the surprisingly early contrast between nom. *feda* (for expected *fedo*) and gen. *fedot* (*e*= /ɛ̄/ in both) in the Cambrai Homily it is tempting to suggest that final /-o/ was lowered to [-ɔ] around the middle of the seventh century and that this sound intermediate between [o] and [a] could be spelt either *-o* or *-a* as in Würzburg (and Cambrai?) before it was unrounded to /-a/ normally spelt *-a* as in Milan.

5.6 As a result of syncope hiatus could only normally be found between

a stressed and an unstressed vowel in Old Irish disyllables (see 2.1), whence alternations of the type subj. 3sg. *-tlia* < **-tlea* < **-tli(y)āh* < **-tleyāset* but *-rothla* < **-ro-θl[e]a* < **-ro-tli(y)āh* etc. or pass. *-tlethar* < **-tle[a]θor* < **-tli(y)āθor* etc. (pres. *-tlen* 'removes'). Typical examples of hiatus disyllables are OIr. *a:taat* 'are', *biid* 'is wont to be', *soid* 'turns', *-soat* 'turn', *tee* 'hot' (< **teēh* < **tepents*), and a trisyllable by anaptyxis (1.2) such as *loathar* /loəθər/ 'tub' < **loaθr* < **lowatr* apparently also retained hiatus at first but soon contracted to *lóthur* in Old Irish. Contrasts such as that between *gniid* 'does' < **gnieθ´* (4.3) < **gniyeθi*, *gníthi* 'does it' < **gnieθi* < **gniyeθiy-e*, *ol-daas* 'than is' and *táthut* 'you have' (< **taeθiu-tu*), or *tee* 'hot' and dat. pl. *-thétib* (< **teedov´*) are most straightforwardly explained by positing a pre-syncope (otherwise **gnithi* < **gni[e]θi*) contraction of *ie*, *ae*, *ee* to *ī*, *ā*, *ē* respectively in a tri- as opposed to a di-syllable after the main apocope. On the other hand, it is difficult to square a form like 3pl. rel. *gníte* 'who do' vs. *gniit* 'they do' < **gniod´* < **gneod´* < **gniyonti* with the development seen in *-tlethar* above, gen. *lego* 'leech's' in 4.3, 3pl. rel. *crete* in 2.1 and so on, since this would surely imply **gniyonti-yo* > **gneod´e-(y)a* > **gne[o]d´e* > OIr. pres. **gneite* indistinguishable from the corresponding subj. form. That being so, a form like *gníte* was probably created from abs. *gniit* on the analogy of *gníthi* in relation to EOIr. *gniith* (> OIr. *gniid* by 3.1). Occasionally syncope could leave two unstressed vowels in hiatus but in such cases contraction would seem to have taken place by the beginning of the Old Irish period: e.g., *aisndís* < **es^{t}ndiis* < **es[ɪ]ndewis* (1.2) or 3sg. subj. *do:intá*, *tintá* 'may return' < **t(o) ɪnd^{t}hoā* < **ænde-howāθ*, vb. n. *tintúd* < **t'ind^{t}howuθ* < **t'ind^{t}howeuθu* < **t'ænde-howeθuh*.

6.1 MIDDLE IRISH DEVELOPMENTS. Although the numerous innovations of Middle Irish (c. 10th.-12th. cent.) in relation to Old Irish concern morphology (see *EIV* 176-266 on the verb and Breatnach, *SnaG*, 221-333 in general) rather than phonology for the most part, a number of significant phonological developments in the vowel system above all will be briefly considered here (further details in Breatnach, *SnaG*, 227-36). A number of these also occur sporadically in Old Irish sources (McCone, 1985c, 85-8), which probably indicates that they were becoming current in ordinary speech by then but had not yet gained full recognition in the learned standard.

A phenomenon that affected both the vowel and consonant systems seems a suitable starting point. Many Modern Irish (as opposed to Scots Gaelic) forms indicate a shift in the syllable centre whereby sequences of short back vowel plus palatal on-glide or short front vowel plus non-palatal on-glide became sequences of non-palatal off-glide plus *i* or palatal off-glide plus *a* at some time after the Old Irish period: e.g., OIr. *fer* /fer/ [fe^{a}r] vs. ModIr. *fear* /f´ar/ 'man'

(ScoG. *fear* /f´er/), OIr. *guide* /guð´e/ [gu^{j}ð´e] vs. ModIr. *guí*, trad. *guidhe* /gī/ or /giyə/ 'prayer' (ScoG. *guidhe* /guyə/). Spelling fluctuations of the type OIr. *coire* /kor´e/ 'cauldron' or *laig-* /Laɣ´-/ 'lie' but *coire*, *caire*, *cuire* or *laig-*, *loig-*, *luig-* in later manuscripts point to a stage where what was variously written *a/u/o* was a non-palatal off-glide in emergent pronunciations /kir´ə/, /Liɣ´-/ and so on. Occasional Middle Irish spellings such as *-chrean* (cf. OIr. *-cren* /-kren/), *-cear* 'fell' (OIr. *do:cer* /-ker/) probably reflect shifted /-x´r´an/, /-k´ar/. Before a guttural fricative rounding, which can be formulated as OIr. (C)/ex/ɣ/ = [e^{o}x/ɣ] > MidIr. (C´)/ox/ɣ, tended to accompany this shift: e.g., MidIr. *-deochatar* 'they went', acc. pl. *euchu* 'horses', *-geogain* 'killed' vs. OIr. *-dechatar*, *echu*, *-geguin*. In unstressed internal syllables [e]/ə/ and even /ē/ apparently underwent a comparable development to yield [a]/ə/ and /ā/ respectively: e.g., MidIr. *-aichneastar* 'recognised' with -C´[astar] for OIr. *-estar* -C´[estar] (both phonemically -C´/əstər/) or *aileán* 'island' (also *oil-*) reflecting /il´ān/ for earlier *ailén* /al´ēn/.

A crucial result of these changes, which were probably more widespread in the speech of the Middle Irish period than the generally conservative orthography suggests, was to phonemicise the opposition between non-palatal and palatal consonants in anlaut, since an initial non-palatal consonant could now be followed by a front as well as a back vowel and conversely a palatal consonant could now precede [ō] (5.4), [o] and [a] as well as a front vowel.

6.2 Beyond this the consonant system underwent little major change between Old and Middle Irish, although a number of assimilations and dissimilations are worth mentioning. For instance, OIr. *ln*, *ld* and *nd* undergo progressive assimilation in Middle Irish, whence O/MidIr. *comallaid* 'fulfils' (OIr. *comalnaithir*), MidIr. *ac(c)allam* 'address' (OIr. *ac(c)aldam)*, MidIr. *clann* 'offspring' (OIr. *cland*). The optional preservation of a spelling like *cland* when /klaN/ had become the normal pronunciation generated 'hypercorrect' spellings like *cend* alongside *cenn* (OIr. *cenn* /keN/) in Middle Irish. Although /ṽ/ and /v/ continue to be written *m* and *b* respectively with such consistency that the sounds were clearly still distinct as a rule, MidIr. pret. *mebaid* 'broke' (OIr. *memaid* /meṽəð´/) shows dissimilation of /ṽ/ to /v/ after /m/ plus vowel while *náem* 'saint' (OIr. *nóeb* /noiv/) manifests the reverse assimilation of /v/ to /ṽ/ after /n/ plus vowel. Initial *mr-* and *ml-* had usually become *br-* and *bl-* in Middle Irish: e.g. OIr. *mrath* 'treachery' and *mligid* 'milks' but MidIr. *brath*, *bligid*. Occasional spelling confusions such as *anag* 'remaining' for *anad* and gen. *mullaid* 'crown's' for *mullaig* suggest that the Modern Irish merger of /ð/, /ð´/ and /ɣ/, /ɣ´/ as /ɣ/, /y/ was already under way in Middle Irish.

6.3. Although early hiatus has survived right down to the present in Scots Gaelic, in Ireland hiatus disyllables were beginning to undergo contraction to monosyllables with a long vowel as early as Old Irish on the evidence of

occasional spellings in the Glosses like *-tat* for *-taat*, *bíad* for *biad*, *-gníat* for *-gniat* and sporadic contracted forms in Old Irish poems like *Félire Óengusso* (Carney, 1983, 194-6). In view of I.6.4 it is quite possible that spellings like *bíid* 'is wont to be' in the Glosses represented contracted /bīð´/ rather than hiatus /biəð´/ or the like. Be that as it may, contracted forms like *óc* 'young' for OIr. *oac* steadily gained the upper hand in the Middle Irish period, Breatnach (*SnaG*, 231) noting metrically determined instances such as monosyllabic *déc* '-teen', *síur* 'sister', *cóir* 'right' for normally disyllabic *deac*, *siur*, *coir* in Old Irish.

It has already been seen (5.3-4) that streamlining of the system of diphthongs was well under way in Old Irish. These trends neared completion in Middle Irish with the probable replacement of *u* as the second element of a diphthong by a mere non-palatal on-glide, as in dat. *nirt* /niRt/ for *niurt* instead of OIr. *neurt* (nom. *nert*) on the analogy of *fer*, dat. *fiur* etc. (see 2.3). The product of the merger of /ai/ and /oi/, designated /ai/ in 5.4, appears as a monophthong in all Modern Irish and Scots Gaelic dialects, although the details vary considerably (see O'Rahilly, 1932, 27-38), and some examples of the typical southern monophthongisation to /ē/ are found in Middle Irish texts: e.g. *é(i)n-* for *óen-* 'one', *ébind* for *aíbinn* 'pleasant', *-fébair* for *-fáebair* 'sharp edges'. Examples of /ī/ established by rhyme instead of /ai/ and /ui/ are *a:taí* 'you are' rhyming with *do:gní* 'you do' and *druí* 'druid' rhyming with *rí* 'king' (Breatnach, *SnaG*, 233). The only inherited diphthongs unaffected by this attrition were the latecomers /ia/ and /ua/ first developed around the end of the seventh century (4.1) but this process of simplification was rapidly overtaken in the spoken language by the development of new diphthongs as a result of the loss of various internal voiced fricatives during the Early Modern Irish period (cf. Greene, 1976, 44).

6.4 By far the most important phonological development in Middle Irish was the complete eradication of such phonemic distinctions between short unstressed vowels as Old Irish had maintained (but see McCone, 1985c, 87-8 on sporadic early confusions in unstressed final vowels). It will be recalled that proclitics basically had only three short vowel phonemes /a/, /o/ (written *o* or *u*) and /i/ as a result of 4.2, that internal unstressed vowels only differentiated /ə/ and /u/ phonemically after 4.3, and that the full fivefold distinction between /a/, /o/, /u/, /e/, /i/ in absolute final position was reduced quite early in the eighth century to a fourfold one as a result of the merger of /a/ and /o/ as /a/ by 5.5. In Middle Irish all of these unstressed vowels were reduced to schwa /ə/, a process which inevitably had enormous morphological repercussions and is clearly reflected in the loss of distinctions between unstressed final vowels in rhyme.

Orthographically this was manifested in the widespread confusion of previously distinct spellings. A few examples of this will suffice here. As far

as proclitics were concerned, there was no longer a distinction between pres. 3sg. cop. *is* 'is' and rel. *as* 'which is' (OIr. /is/ and /as/, MidIr. both /əs/) or between the vowel of *ro:gab* 'has seized' and that of *ra:ngab* 'has seized him' (OIr. /ro/ and /ra/, MidIr. both /rə/), the upshot being that both copula forms could be spelt *is* or *as* and that *ra:gab* and *ro:ngab* became alternatives to the original spellings (*EIV* 183). Old Irish differentiation of internal unstressed /ə/ as in *as:rubart* 'he has said' from /u/ as in *as:ruburt* 'I have said' disappeared in Middle Irish when the latter became /-ruvərt/ (often written *-rubart*) too, an ambiguity that triggered a new 3sg. *-rubairt* with palatal final (*EIV* 264-5). The falling together of all short final vowels as schwa had particularly serious consequences. For instance, a *yo*-stem like *céile* 'client' with OIr. sg. nom. *céile*, voc. *céili*, acc. *céile*, gen. *céili*, dat. *céiliu*, pl. nom. *céili*, voc./acc. *céiliu*, gen. *céile*, dat. *céilib* simply became /kēl´ə/ throughout except for the dat. pl. in Middle Irish with the result that all of the vowel-final forms could be written *céili*, *céile* or (rarely except for the dat. sg. or acc. pl.) *céiliu* indifferently. Similarly forms with preceding non-palatal consonant such as *dalt(a)e* (nom., acc. sg., gen. pl. in OIr.), *dalt(a)i* (voc., gen. sg., nom. pl. in OIr.), *daltu* (dat. sg., voc./acc. pl. in OIr.) 'foster son(s)' became free variants (although *-u* was rare outside the dat. sg. and voc./acc. pl.) in Middle Irish alongside *dalta*, all representing /daltə/. It is hardly surprising that this serious ambiguity gave rise to new analogical plural forms (Greene, 1974, 195-6).

CHAPTER SIX

The Great British Vowel Shift.

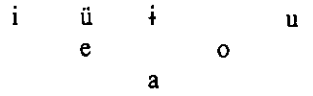
1.1 THE BASIC ISSUE. Most linguists are familiar with the so-called 'Great Vowel Shift' that affected the long vowels of Early Modern English (e.g. Bynon, 1983, 82) and has been subjected to a classic structuralist analysis by André Martinet (1955, 248-56). The present chapter is concerned with a less well known but considerably older set of shifts in the vowel system of British Celtic.

1.2 The vowel phonemes ascribed to Insular Celtic in III.5.7 provide the obvious starting point. It is of no immediate concern here whether *eu* became *ou* as early as Proto-Celtic, as argued in chapter two, or later in the separate prehistories of all attested Celtic languages. Although *ou* (including < *eu*) was monophthongised to *ō* in the prehistory of both Irish and British, its retention as a diphthong in the first instance in Gaulish and Celtiberian (I.2.4 and 3.6) proves that this was not a general Celtic and, therefore, not a Proto-Celtic phenomenon. It may not even have been a feature of Insular Celtic prior to the separation of these two branches if occasional spellings such as Tacitus' *Boudica* or LOVCETIO and TOVTATI on British Latin inscriptions (*LHEB* 306-7) are taken at face value. Certainly *ou* > *ō* is so well motivated as a means of restoring balance to the system in II.5.4 that it could easily have occurred in Irish and British independently. Be that as it may, early spellings such as *Londinium* in Tacitus and NODONTI or NODENTI on British inscriptions, not to mention the frequent merger of internal Latin long *ō* with this sound in loanwords, strongly support Jackson's (*LHEB* 312-4) contention that monophthongisation had taken place in British by the end of the first century A.D. at latest. The result was the (Insular Celtic or) Proto-British reversion below to the configuration of five short and five corresponding long vowel phonemes that had been characteristic of early Proto-Celtic prior to the various changes discussed in chapter two.

i		u	ī	ū
	e	o	ē	ō
		a	ā	

1.3 This Proto-British system combining five basic vowel qualities with the distinctive feature ±*length* stands in marked contrast to the system inferred below for Old Welsh from about the ninth century onwards. Since this consists of seven basic vowel phonemes with distinct articulations and merely allophonic

variations in length, the obvious question is how and why this radical restructuring came about.



This is an evident case of what Martinet termed 'isochrony' and defined and explained as follows. 'Isochrony is the condition that arises from the elimination of the phonemic feature of vowel length. The types of process involved may vary considerable from language to language but the end result is always a situation in which the length of every vowel in a sequence basically depends upon phonematic or prosodic environment and one may surmise that isochrony is regularly arrived at through the lengthening of certain originally short vowels that had become too short for their environment and through the shortening of other originally long vowels that had become too long for the checked or unaccented syllables in which they occur' (1955, 248). That being so, the transition from the Proto-British to the Old Welsh system seems a promising candidate for investigation along lines similar to those pioneered by Martinet with reference to the English shift. The above diagrams as well as those in the remainder of this chapter attempt to present various stages in the evolution of the system of vowel phonemes by using vertical position to denote high (top) versus low (bottom) plus slanting axes for front unrounded (*i*, *e* etc.) and back rounded (*u*, *o* etc.) vowels intersecting at back unrounded *a*. The intervening space is reserved for front rounded vowels (e.g. *ü*) to the left, central rounded vowels (e.g. ʉ) to the right and central unrounded vowels (e.g. ɨ) in the middle.

1.4 In his seminal book *Language and History in Early Britain* published in 1953 Kenneth Jackson has erected an imposing chronological framework for the many sound changes to affect British Celtic during the first twelve centuries of the Christian era. This combines logically deduced relative linguistic chronologies with broad absolute dates assigned to certain developments. These in turn depended upon the scanty inscriptional and vernacular record plus the various external correlations implied by Latin loanwords in British, British loanwords in Irish and Anglo-Saxon placenames of British origin. Thorough though Jackson's treatment was in virtually every other department, it could be and indeed has been (Watkins, 1954) criticised for paying insufficient attention to structural considerations. In an important recent reappraisal Patrick Sims-Williams (1990) has profitably incorporated this dimension into parts of an overall argument that some of Jackson's absolute dates could be pushed back by up to a century without doing violence to the available evidence. Within the parameters set by that evidence the following discussion of the transformation

of the Proto- into the Late British vowel system will attempt to go a stage further and place structural considerations in the foreground throughout.

2.1 BREAKDOWN OF THE INSULAR CELTIC SYSTEM. Although there may be room for manoeuvre on absolute dating, the principal unconditioned sound changes to affect the above Proto-British system of five long vowel phonemes prior to the loss of phonemic length are non-controversial. The first batch to concern us are:

(a) The close or mid high back rounded vowel *ō* had been raised to *ū* by the fourth century A.D., to judge from spellings like Ammianus Marcellinus' *Lundinium* and inscriptional NUDENTE vs. Tacitus' *Londinium* and NODONTI or NODENTI. Jackson (*LHEB* 305-15) suggests the end of the third century as a reasonable date for this development, which underlies MW *tut* (Mod. *tud*) 'people' < **tūd* < **tūtā* < **tōtā* < **toutā*). However, the demonstrable conservatism of Romano-British orthography led Sims-Williams to formulate the sound principle that 'as a general rule, a recording of a phonological innovation in an inscription is significant chronologically, but a *non*-recording is insignificant. Hence epigraphy can rarely stand in the way of *ante*-dating sound changes' (1990, 237). In similar vein Arwyn Watkins has pointed out that 'the early appearance of a changed form is of far greater importance than a great many more, but later, examples of unchanged forms' (1966, 1). That being so, an earlier date for this change in the third or even the second century can hardly be excluded.

(b) In non-final syllables the Proto-British and Proto-Celtic diphthong *oi* fell together (except in auslaut, where it had already become *-ī* in Insular Celtic; III.5.7) with *ū* from *ō* and then shared its development, as can be seen from a comparison of Middle Welsh *un* /ün/ 'one' < **oinos* (cf. OLat. *oinos* > Lat. *ūnus*) with *tud* 'people' < **tōtā* in (a). There is no good direct evidence for dating. The usual treatment of Latin *ū* like the product of Proto-Celtic *ō* and *oi* in loanwords such as MW (also C and B) *pur* /pür/ 'pure' < Lat. *pūrus* would be surprising if British had no *ū* during the second and third centuries when most such loans can be assumed to have taken place. Jackson resolves this problem by placing *oi* > *ū* shortly after late first-century *ū* > *ȳ* in 1(c) and some time before late third-century *ō* > *ū* in 1(a), concluding: 'thus we have a situation in the second to third century of a native *ō* < *au, ou, eu*, and a Latin internal *ō* which fell together with it; and a native *ū* < *oi*, and a Latin *ū* which was identified with it' (*LHEB* 314).

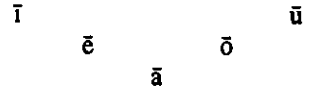
This may be so, but the difficulty would not exist in the first place if, as seems quite feasible, *ō* > *ū* were dated to the second century. This would make *ū* the only long rounded back vowel in British at the time. Assimilation of virtually identical Latin *ū* to this in loanwords like *pur* would be only natural,

and close or mid high Vulgar Latin *ō* would simply have had nowhere else to go, whence a case like Welsh *yscub* 'broom' from **skūb* from **skūpā* for Latin *scōpa*. That being so, there is no firm criterion for ordering British *oi* > *ū* and *ō* > *ū* relative to each other and a more or less simultaneous development cannot be ruled out.

(c) Proto-Celtic and Proto-British high back rounded *ū* was fronted to *ū̄*, as in MW *ki* 'hound' < **kū̄* < **kū*. This process must already have been under way by the time *ō* and *oi* had become *ū* on account of distinct reflexes in Old, Middle and present-day North Welsh. Apart from a couple of presumably very early loans like MW *kip*, ModW *cib* 'vessel, cup' < **kū̄pā* < **kūpā* for Lat. *cupa*, Latin *ū* was not assimilated to this sound but to the *ū* from *ō* and *oi* in (a)/(b), as in the case of *pur*. It thus looks very much as if old *ū* had become *ū̄* by the time a significant number of Latin loanwords began to enter British from the second century onwards. Hence Jackson's (*LHEB* 317-9) suggestion of a late first-century or, if the *cib* type represents an older stratum, an early second-century date.

2.2 Since this absolute date for *ū* to *ū̄* seems reasonably secure, the shift from *ō* or *oi* to *ū* would have to be dated earlier still if a push chain were posited. In that case the lack of any likely examples of *u* for *o* in Roman or Romano-British sources before the fourth century would be rather surprising. This consideration tips the balance of probability in favour of a drag chain with *ū* > *ū̄* by the early second century and *ō* or *oi* > *ū* not long after (see Bynon, 1983, 81-6 on similar developments in French and Attic Greek as well as on push and drag chains in general). Stages I-III below represent this process and its effects.

Stage I



Stage II

Stage III

Although the fronting of *ū* > *ū̄* did not affect the basic inventory of long vowel phonemes, it did have one major structural effect upon the system. At stage I the contrast between mid high /ē/ and /ō/, high /ī/ and /ū/ can be stated

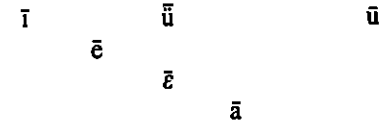
in terms of front/back as well as unrounded/rounded. However, once high back /ū/ had become high front /ü/, only *unrounded/rounded* remained as a distinctive feature capable of covering both pairs of oppositions. This in turn left /ō/ free to be raised to /ū/ without significantly altering a skewed system in which an unrounded front /ē/, /ī/ primarily distinguished by height came to be opposed to high rounded /ū/, /ü/[ū̃] primarily distinguished by position.

2.3 That brings us to the next sequence.

(a) An open or mid low vowel phoneme /ɛ̄/ arose by monophthongisation of Proto-British and Proto-Celtic *ai*. This monophthong is reflected in Anglo-Saxon placenames and appears as *e* on Romano-British inscriptions but became an *o*-diphthong in all the British languages in contradistinction to the *u*-diphthong that resulted from the mid high long *ē* inherited from Proto-Celtic. Thus OW *coit*, MW *coet*, *koed* 'wood', Rom.-Brit. *-cetum* < PC **kaitos* (Gaul. *Καιτο-*, *Ceto-*) or MW *hoed(y)l* 'life', Rom.-Brit. *Setlo-* < PC **saitlo/ā-* (cf. Lat. *saeculum*). Jackson (*LHEB* 324-9) argues from the lack of certain cases of *ai* in British that this had become ɛ̄ by the end of the first century A.D., if not before, but the meagre inscriptional evidence leaves the possibility of a date a century or two later open.

Since Proto-Celtic *ei* > *ē* had reduced the short *i*-diphthongs to *oi* and *ai* at an early stage, it is structurally tempting to posit their more or less simultaneous eradication by monophthongisation to *ū* and ɛ̄ by 2.1(b) and 2.3(a) respectively. If so, stage III above soon gave way to:

Stage IV



It would thus seem that by about the end of the second century a new mid low front vowel had generated imbalance in the system by introducing a fourth unrounded phoneme that had no counterpart among the three rounded vowels. There was an obvious means of restoring equilibrium, namely:

(b) The rounding of low back *ā* to open or mid-low back ɔ̄. This remained a mostly rounded monophthong in Cornish and Breton but the usual Old Welsh reflexes were a diphthong *au* in final, that is to say stressed, syllables versus short *o* in non-final, i.e. pretonic, syllables, as the following examples show: OB *mor*, MC *mur*, OW *maur*, MW *mawr* 'great' < **mɔ̄r* < PC **māros*; OW *trintaut*, MW *trindawt* < **trīnidɔ̄d* for Lat. *trīnitāt-*; OB *brotr*, MW *brawt*, *brawd* 'brother' < **brɔ̄dr* < PC **brātīr*, MW *broder*, *brodyr* 'brothers' <

**brōder* < PC **brāter-es*. Stage V below was brought into being by the change *ā* > ō.

Stage V

ī ū ū

ē

ē ō

2.4 Jackson (*LHEB* 287-92) dates British *ā* > ō as late as circa 500 A.D. If this were so, the shift in question could hardly be ascribed to pressures in the system established some three centuries earlier at stage IV. Since relevant Old English placenames regularly reflect this rounding (*LHEB* 292), it can hardly be dated much later than the early sixth century. Indeed, a significantly earlier date is indicated by sporadic instances of *o* for *a* in Roman or Romano-British sources from about the third century A.D. onwards (*LHEB* 290-1), given that a single innovatory spelling has greater evidential value regarding actual pronunciation than numerous traditional ones. Moreover, in a few cases, notably Middle Welsh *nawn* 'afternoon' and *awr* 'time' < **nōn*, **ōr* < Lat. *nōna*, *hōra*, Latin *ō* was assimilated to British ō < *ā* rather than to *ū* in the usual way. On Jackson's dating of the rise of ō this could not have happened before the sixth century, well after the end of Roman occupation. As he himself candidly admits (*LHEB* 307-8), this is uncomfortably late for such basic borrowings. A fourth-century date would suit much better and would be quite viable if the rounding of *ā* in British and, presumably, also in British Latin were dated circa 300 A.D. in line with the inscriptional data.

Jackson, however, felt obliged to discount this weighty evidence and opt for a much later date because 'the first group of British loanwords in Irish, borrowed in the middle of the fifth century, show that the British sound was still *ā*, whereas the second group, borrowed during the sixth century, show that it had by then become ō' (*LHEB* 291). The basic issue here is the different reflex of British Latin *ā* seen in Old Irish *cáise* 'cheese' from *cāseus* or *srát* 'road' < *strāta* on the one hand and that in Old Irish *póc* 'kiss' from an oblique case of *pāx* as in *osculum pācis* or *oróit* 'prayer' from *ōrātio* (/orōd-/ with short *o*- for some reason) on the other.

2.5 Following in the footsteps of Sarauw and above all MacNeill, Jackson distinguished two main groups of Latin loanwords in Irish, namely a smaller 'Cothriche' group that 'was a direct consequence of the mission of St. Patrick, and is therefore to be dated in the middle of the fifth century' and a larger 'Pádraig' group 'introduced in the sixth century, a result of the very close relations between the monasteries of Ireland and Britain during that century' (*LHEB* 133). Among other things, the two sets are characterised by the following differences in their treatment of British Latin ('Cothriche' first, 'Pádraig' second): (i) *á* vs. *ó* for *ā*/ō, (ii) partial retention vs. total loss of terminations of the *-ius*, *-io* type, (iii) (*k*^{w} >) *c* vs. *p* for *p*, (iv) *ch*, *th* by Irish vs. *c* [g], *t* [d](, *p* [b]) by British lenition of postvocalic *c*, *t*(, *p*), (v) shortening vs. non-shortening of unstressed alias non-initial vowels, (vi) syncope vs. non-syncope of post-tonic vowels. As earlier and later borrowings of Lat. *Patricius*, OIr. residual *Cothriche* vs. standard *Pátraic* contrast diagnostics (ii)-(iv), while a similar relationship between *ortha* and *oróit*, both 'prayer' < Lat. *orātio*, can be established on the strength of (ii) plus (iv)-(vi). Likewise *cáise* is 'Cothriche' under the terms of (i)-(ii) and *póc* 'Pádraig' in accordance with the criteria in (i) and (iii).

There are, however, a disturbing number of 'hybrid' loanwords combining features from both groups, e.g. OIr. *pairche* 'monastic federation' < Lat. *parūchia* (*paroecia*) with 'Cothriche' (ii) plus (iv)-(vi) but 'Pádraig' (iii). OIr. *srát* < Lat. *strāta* above is, of course, a further case in point, as it has 'Cothriche' *á* under (i) but 'Pádraig' *t* [d] under (iv). Jackson is naturally aware of this phenomenon but seeks to minimise its impact upon the clear chronological divide posited between the allegedly mid-fifth-century 'Cothriche' and the sixth-century 'Pádraig' group by rather vaguely suggesting that 'this may sometimes be explained by the influence of analogy or by suffix substitution' and 'changes in loanwords... may have taken place at different rates in different parts of the country' (*LHEB* 134-5). As for the combination seen in *srát*, 'the reason may be quite simply because the various changes within the two groups need by no means have synchronised exactly: lenition in British is older than *ā* > ō' (*LHEB* 130), the corollary presumably being that *srát* was borrowed between 'the second half of the fifth century' and 'the later fifth to early sixth century' but *póc* etc. after the latter date by Jackson's reckoning (see *LHEB* 695). No answer is given to the obvious further question begged by a strict application of the two-group theory, namely whether this makes *srát* a late 'Cothriche' or an early 'Pádraig' borrowing.

The Gordian knot of problems raised by 'mixed' forms of this type has now been cut by Damian McManus' (1983) cogent argument that these are too numerous and diverse for the hypothesis of two discrete groups to be sustained. Instead of arbitrarily assigning most of the shifts in question to a gap between two major influxes of loanwords, McManus posits the more or less continuous admittance of borrowings from British Latin into Irish in the wake of Christianisation in the fifth and sixth centuries. During this period of major phonological upheaval in both Irish and British a succession of changes in the former especially conditioned shifts such as those in (i)-(vi) above one by one at different times. This scenario, which has received the accolade of rejection by Karl Horst Schmidt (1988, 6-7; 1990, 128-31), is the only one with the

flexibility necessary to account for the facts, generating as it does (to use black-and-white 'Cothriche'/'Pádraig' terminology) both 'pure' and 'hybrid' forms with equal ease by placing any given loanword at the appropriate point in a polychrome spectrum. For example, if the shift in (iii) preceded those in (iv) and (ii) as McManus suggests, OIr. *pairche* < *parūchia*, *peccath* (> *-ad*) 'sin' < *peccātum* and *pridchid* 'preaches' < *praedicat* will simply have been borrowed after the first shift but before the other two and thus cease to be an embarrassment in relation to 'consistent' *Cothriche* etc. borrowed before and *Pátraic* etc. borrowed after all three.

2.6 As McManus (1984) has shown, the final vowel of OIr. *cáise* 'cheese', MIr. *ortha* 'prayer' reflects the assimilation of Lat. *cāseus*, *orātio* etc. to the closest native inflectional patterns as **kāseyah*, **oraθ-iyu* prior to the Primitive Irish loss of final syllables around 500 A.D., whereas its absence in later loans like *oróit* 'prayer' is due to an analogous assimilation to the different native patterns predominating after the loss of final syllables. Since the former type also includes cases like OIr. *notaire* 'scribe' < *notārius* with *t* = British [d] rather than Irish *th* under (iv) above, OIr. *srát* 'road' could have been borrowed as an *ā*-stem before or after loss of final syllables. In other words, there is no firm criterion for dating its adoption or that of the OIr. *ā*-stem *plág* 'plague' < Lat. *plāga* later than that of *cáise* once the 'Cothriche'/'Pádraig' straitjacket has been removed. On the other hand, forms with *ó* rather than *á* like *oróit* < *orātio* or *trindóit* < *trīnitāt-* should be later than the post-apocope rise of new long vowels by compensatory lengthening in unstressed syllables after the shortening in IV.2.1(a) above and there is no difficulty in dating the only reliable example in a stressed syllable, *póc* < *pāc-*, to the same phase. In fine, nothing prevents the indeterminate *srát* and *póc* being grouped with *cáise* and *oróit* respectively.

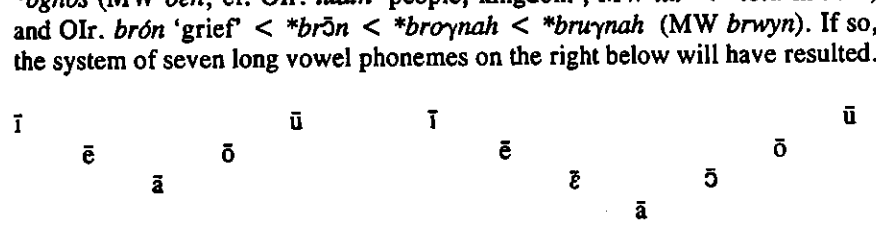
There is, then, no likely example of *ó* rather than *á* as the Old Irish reflex of British Latin *ā*/*ō* in loanwords predating the early sixth-century lengthening of stressed (initial) or unstressed (non-initial) vowels in compensation for the loss of certain fricatives before *r*, *l* or *n* (IV.5.1) seen in OIr. *én* 'bird' < **etnos* (MW *ed(y)n* 'bird') < **pet-no-s*; OIr. *cenél* 'clan' < **kenetlom* (OW *cenetl*, MW *kenedyl*, ModW *cenedl* 'clan'). It seems legitimate to ask whether there is any connection between these two developments.

By ascribing the difference between fifth-century *cáise*, *srát* and sixth-century *oróit*, *póc* to British rounding of *ā* circa 500 A.D. without more ado Jackson uncharacteristically departs from his usual sound practice of considering the phonological system of the target language at the time of the borrowings as well as that of the source language. Once this crucial factor is taken into account, the Old Irish forms cease to have any bearing upon non-rounding versus rounding in British.

Whether by inheritance from Insular Celtic or as a result of a parallel but independent monophthongisation of *ow* > *ō*, Primitive Irish had a set of long vowel phonemes virtually identical to that of Proto-British (stage I above), namely low *ā*, relatively close or mid high *ē*, *ō* and high *ī*, *ū* as on the left below. At this stage the obvious native sounds to substitute for an alien mid low rounded back ɔ̄ in borrowings from British Latin were low unrounded back *ā* or mid high rounded back *ō*. Since the probably mid high rounded British Latin *ō* was usually represented by the virtually identical Irish *ō*, as in Old Irish *scúap* /skuab/ 'broom' (< **scōb*) from British Latin *scōpa* /skōba/, only *ā* remained as a phonemically unambiguous Primitive Irish substitute for British Latin ɔ̄. Consequently Old Irish *cáise*, *srát* and so on do not necessarily presuppose contemporary British Latin /kāseus/ and /strāda/ rather than rounded /kɔ̄seus/ and /strɔ̄da/ at the time of borrowing.

2.7 As far as the later substitution seen in Old Irish *póc*, *oróit* etc. is concerned, the crucial point is that this apparently postdates the compensated loss of various spirants before a liquid or nasal seen in *én* and *cenél* above. The *ē* resulting from this compensatory lengthening was clearly different from the one inherited from Proto-Celtic. Old *ē* was retained before a palatal but had undergone breaking to the diphthong *ía* before a non-palatal consonant by about 700 A.D., whence frequent alternations such as those between Old Irish nom. sg. *cíall* 'sense', *fíach* 'debt' < **kēL*, **fēx* and gen. *céille* /kēL´e/, *féich* /fēx´/. The new long *e* by contrast remained unchanged before a non-palatal while developing into a rounded diphthong before a palatal liquid or nasal as in Old Irish nom. sg. *én*, *cenél* < **eθn*, **keneθl* vs. gen. *éoin*, *cenéoil* < **eθ´n´*, **keneθ´l´* (V.4.1). Since inherited *ē* was probably mid high as suggested by Jackson, the new long *e* by compensation presumably differed from this in being more open, i.e. mid low. Its arrival on the scene produced minimal pairs such as the **wēn* (< **wēðnā*) and **wēn* (< **weγnos*) underlying Old Irish *fían* 'warrior band' and *fén* 'waggon'.

Although there is no correspondingly firm criterion for differentiating the new long *o* by compensatory lengthening from inherited mid high *ō*, there is nothing to contradict the reasonable assumption that the situation was parallel to that of ɛ̄ and *ē*, whence OIr. *úan* 'lamb' < **ɔ̄n* < **oγn* < **oγnah* < **ognos* (MW *oen*; cf. OIr. *túath* 'people, kingdom', MW *tut* < **tōtā* in 2.1a) and OIr. *brón* 'grief' < **brɔ̄n* < **broγnah* < **bruγnah* (MW *brwyn*). If so, the system of seven long vowel phonemes on the right below will have resulted.



Once Irish had acquired an ɔ̄ similar to the British and British Latin outcome of *ā* in this way, it will have been the obvious equivalent for the latter in loanwords, whence OIr. *póc*, *oróit* etc. Prior to this development, however, *ā* was the only convenient substitute available in Irish, whence *cáise*, *srát* etc. In short, this shift from *ā* to *ɔ̄* in borrowings from British Latin can be adequately accounted for in terms of a change in the Irish phonemic system, thus rendering the postulate of British *ā* > ɔ̄ around 500 A.D. quite unnecessary as an explanation. That being so, we are free to assume that the British sound rendered by Irish /ā/ here was [ɔ̄] rather than [ā] and the only serious obstacle to dating British *ā* > ɔ̄ as far back as the end of the third century disappears. In short, stage V probably succeeded stage IV above quite quickly in British and the first and second vowel shifts summarised earlier may be taken to have been complete by about 300 A.D.

3.1 FURTHER EROSION OF PHONEMIC LENGTH. Comparison of the resultant system of long vowels with the hitherto essentially unchanged set of five short vowel phonemes reveals some reduction in the role of length as a distinctive feature. It had ceased to be phonemically indispensable at the three points in bold italics out of a total of eleven below (for convenience /ɛ̄/ rather than /ē/ is selected as the correlate of /e/, which may well have been [ɛ] phonetically or have had both [e] and [ɛ] allophones).

Stage Vb
(short and long vowels)

i		u	ī	***ǖ***		ū
				ē		
e	o			ɛ̄	ɔ̄	
	a					

3.2 Movement away from phonemic correlations of length was then decisively advanced by three further shifts.

(a) Unrounding of *ǖ* (< *ū* by 1c) to *ī*. This change is not only directly observed in examples like MW *ki* 'hound' < **kī* < **kū̄* < PC **k(w)ū* (OIr. *cú*) or *kil* 'back' < **kūl-* < IC **kūlos* (OIr. *cúl*) with the same vowel as MW *hil* 'seed' < PC **sīlom* (OIr. *síl*) etc. but was also responsible for the final *i*-affection seen, for example, in MW *kereis* 'I loved' < **karass-ī* < **-ū̄* < PC **-ū* (OIr. *-carus*) < **-ō* (Lat. *reg-ō* etc.). Clearly, then, *ǖ* > *ī* had occurred before final *i*-affection (*LHEB* 319-21), which is dated by Jackson to the late fifth or early sixth century before the loss of final syllables (*LHEB* 603). This

terminus post quem non may be matched by a *terminus ante quem non* deduced from the substitution for final Latin *-ō* indicated by MW *dreic* 'dragon' < **dragī* (< **drakū̄* ?), which Jackson (*LHEB* 302-3) considered best explained in terms of a vowel still rounded when Latin words were being borrowed into British from the second to the fourth centuries. A fifth-century date thus seems reasonable for *ǖ* > *ī*, Jackson plumping for the middle of that century (*LHEB* 319). McManus (1984, 152-3), however, has argued convincingly that the substitution for Lat. *-ō* underlying MW *dreic* etc. was not a phonologically but a morphologically motivated one involving the assimilation of a Latin to a British *n*-stem pattern. In that case the nom. sg. could have been **-ī* at the time just as well as **-ū̄*, Jackson's *terminus ante quem non* falls and an earlier date for *ǖ* > *ī* becomes a possibility.

(b) (*ō/oi* > by 2.1a/b) *ū* > *ǖ*, spelt *i* or *u* in Old and *u* or *v* in Middle Welsh, e.g. MW *llu* or *llv* /ɬü/ 'host' < OW **ɬüγ* < **ʟūγ-* < IC **slōgos* (OIr. *slóg*, *slúag*). Bede's early eighth-century *Dinoot* /dünɔ̄d/, MW *Dunawt* < Lat. *Dōnātus* is the earliest example of this fronting, which Jackson (*LHEB* 309-11 and 315-7) dates to the sixth century although a still earlier date can hardly be ruled out.

(c) The first significant shift in the short vowel phonemes inherited from Insular Celtic, namely *i* > *ɪ* (spelt *i/e* in OW/B/C; MW *y/i*, MB *e*, ModW *y*) as in OW/B *celmed*, MB *caluez*, MW *celuit*, *keluyd*, ModW *celfydd* 'able, expert' < **kalmiyos* (OIr. *calmae* 'strong, brave'). As a result the British reflexes of Proto-Celtic *i* are the same as those of the Proto-Celtic allophone [ɪ] of /e/ before nasal plus obstruent (III.5.1) seen, for example, in OB *hint*, MW *hynt*, MB *hent* 'way' < PC **sɪntus* (OIr. *sét*) < **sentus*. In essence, then, the reflex of PC /i/ merged with the [ɪ] inherited as an allophone of /e/ to produce a single phoneme in British Celtic. Orthographic hesitation between *i* and, more rarely, *e* in Old Welsh, Cornish and Breton sources points to a sound intermediate between high front *i* and mid front *e*, the obvious candidate being an English-style mid high front /ɪ/. This, indeed, is the value ascribed by Jackson to the Old Cornish and Breton reflexes (*LHEB* 284).

3.3 The reflex of this sound in Middle Welsh final syllables is usually spelt *y*, whereas *i* there normally represents the outcome /i/ of *ī* (including < *ū* by 3a and 1c) and *u/v* stands for /ü/ (< *ū* < *ō* and *oi* by 3b and 1a/b). In early Modern Welsh *u* begins to be confused with *y*, a state of affairs reflected in present-day North Welsh pronunciation of both as high central unrounded /ɨ/ vs. high front /i/ for *i*, e.g. *bys* /bɨs/ 'finger', *mul* /mɨl/ 'mule' but *mil* /mil/ 'animal', *mis* /mis/ 'month'. South Welsh now has /i/ for both, but contrasts like that between SW *bys* /bis/ and *mis* /miʃ/ show that this merger postdates *s* > ʃ after a high front unrounded vowel there. It follows that Middle Welsh *y* in final syllables represented high central /ɨ/ as in Modern North Welsh.

Although Old Welsh orthography does not distinguish *y* from *i*, the existence of a difference in pronunciation there requires, in Morris Jones' succinct words, 'no further proof than that they are different in origin, and if the difference had been lost it could not have been recovered' (1931, 15).

Jackson disputes Pedersen's (*VKG* I 377) view that PC *i* (including < *e* before nasal plus obstruent) was once mid high front [ɪ] throughout British on the following grounds (nb. [ī] instead of [ɨ] in his notation): 'this occurs only in internal affection, which is late (seventh to eighth century, see §176), and *i* must have become *ɪ* before then (see below). There is no real reason why [ī] should not cause metaphony (which is all that is involved) of *a,o,u,e*. It must indeed have become *ɪ* before about 600, when the new type of vowel quantity came into existence (see §35), because original long *i* remained a front vowel, and if original *i* in a word like Pr.W. **sicc* was not already *ɪ* it would have been lengthened to *i* and would have given W. [i], not [ī] as it did, so that we should have had W. **sich*, not *sych*. Hence it must have been **sɪ̈cc* already before the rise of the new quantity system. It was, however, not yet *ɪ* when W. and CB. diverged over this matter, since Brit. *i* gave *i*, not *ɪ*, in PR.CB. perhaps in the first half or not later than the middle of the sixth century (see below). One may suggest, therefore, some time in the earlier part of the sixth century, or perhaps the middle, as the date for Brit. *i* > *ɪ* in Pr.W.' (*LHEB* 283-4).

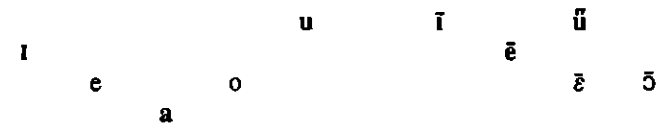
3.4 The case for an early sixth-century dialectal split between SWBrit. mid high front [ɪ] (= OC/B *i/e*, MC/B. *e* [e]) and WBrit. high central [ɨ] (= OW *i*, MW *y*) dissolves on closer inspection. Although not conclusive, the fact that the internal *i*-affection of *o* to *e* seen in OW *emid*, MW *euyd* 'bronze' < **omiyos* (OIr. *umae*) is based on fronting rather than raising speaks for Pedersen's mid high front [ɪ] rather than Jackson's high central [ɨ]. More importantly, Jackson's point about *sych* etc. only excludes a high front [i] precisely equivalent to [ī] in all but length and does not apply to a mid high front [ɪ] that did not, after all, fall together with the reflex of [ī] in Cornish and Breton as a result of the new quantity system, e.g. MB *quic* 'flesh' (OB, MW *cic*), *guir* 'true' (OB/C/W *guir*, MW *gwir*), *quil* 'back' (OB/C *cil*, MW *kil*) with /i/ < /ī/ vs. MB *pec* 'pitch' (OB *pic*, W *pyg*), MB *lenn* 'pool' (OB/C *lin*, MW *llynn*) with /e/ < /ɪ/.

Jackson's (*LHEB* 696) late sixth- to early seventh-century date for the rise of the new quantity system is very close to that of compensated loss of *x* between *i* and *t* in MW *brith, nith* above. His scenario entails development from **brixt*, **nixt*, but these should have yielded MW **bryth*, **nyth* for the same reasons as those just advanced for *sych* unless loss of *x* is dated a little earlier than the rise of the new quantity system. Compensatory lengthening of high central [ɨ] to the only high unrounded long vowel available at that stage,

namely high front [ī], then becomes feasible, but that of mid high front [ɪ] to high front [ī] under the same conditions is still easier to envisage. Finally, the evidence of Old Welsh, Old Breton or Old Cornish orthography, although not conclusive, is perfectly compatible with a virtually identical pronunciation of the reflex of short *i* (< PC *i*, *ɪ* and, by final *i*-affection, *e*) in all three for at least the earlier part of the period (c. 8th.-12th. cent.) in question. The most economical way of accounting for this evidence is to posit a general British merger of the *i* continuing PC *i* as well as the outcome of PC *e* by roughly later fifth-century final *i*-affection with the *ɪ* continuing the PC allophone of *e* before nasal plus obstruent to produce a new phoneme /ɪ/ throughout. Thus, although the Middle and Modern North Welsh reflex represented by *y* was high central [ɨ], this was not necessarily the case in Old Welsh, which could perfectly well have had the same [ɪ] as Old Cornish and Old Breton here. The new mid high short /ɪ/ phoneme now, of course, differed from high front long /ī/ in height as well as length.

3.5 Like *i* > *ɪ* in 3(c), the fronting of *ū* > *ʉ̄* in 3.2(b) can be motivated by the drift away from phonemic oppositions based on length only and provides the obvious knock-on trigger for the unrounding of *ʉ̄* to *ɪ* in 3.2(a), which ultimately led to its complete merger with a hitherto distinct /ī/ phoneme inherited from Proto-Celtic. Obviously *ʉ̄* > *ɪ* must predate final *i*-affection in the second half of the fifth century. A push chain would make *ū* > *ʉ̄* earlier still, but not by much, and a fifth-century date seems plausible for *i* > *ɪ*. Indeed, direct evidence may be available in the form of fifth-century British Latin spellings like NOMENA for *nomina*, EMERETO for *emeritus* and CUNEGNI for *Cunigni* (*LHEB* 191). The later fourth and/or earlier fifth century, then, probably saw the transformation of stage Vb above to stage VI below as a result of this tripartite third vowel shift. As the bold italics indicate, straightforward phonemic oppositions of length had by now been thoroughly marginalised to short versus long *e* and *o* only.

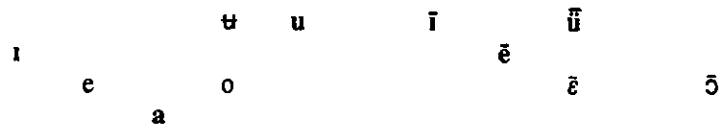
Stage VI



3.6 The case made above for mid high front /ɪ/ as the reflex of earlier high front /i/ etc. in Old Welsh, Cornish and Breton would be strengthened if a satisfactory motive could be found for its replacement by high central [ɨ] by the Middle Welsh period. This brings us to the roughly mid-fifth-century umlaut

of short *e*, *u* and *o* by *i* in a final syllable subsequently lost in the general apocope (*LHEB* 579-603). This 'final *i*-affection' may be illustrated by Middle Welsh examples such as *ych* 'ox' < **uxsī*, *cyrn* (B *kern*) 'horns' < **kornī* (sg. *corn* < **kornos*; OIr. *corn*), *efengyl* 'Gospel' < Lat. *evangelium*. These show that, where epenthesis did not take place, the vowel produced by this umlaut shared the fate of old short *i*, producing high central [ɨ] written *y* in Middle Welsh and *e* from mid high front [ɪ] in Middle Breton. However, Jackson (*LHEB* 586-7) points out that umlauted *o* was still rounded and behaved like *u* when a guttural fricative became yod before *t* and *n* no earlier than the late sixth century on the evidence of Anglo-Saxon placenames of British origin. Thus MW *wyn* 'lambs' < **ʉγn* < **ʉγnī* < **ognī* (sg. *oen* < **oγn* < **ognos*; OIr. *úan*) and *wyth* 'eight' < **ʉxt* < **ʉxtī* < **oxtī* < PC **oxtū* < **oktō*. As is evident from the parallel between MW *nith* 'neice' < **nīt* < **nɪxt* < **nixtī* < **nextī* (OIr. *necht*; PIE **nept-ih*$_2$, cf. Lat. *neptis*, Skt. *naptī*) by raising and *brith* 'speckled' < **brīt* < **brɪxt* < unraised **brixtos*, there is no impediment to formulating final *i*-affection of *e* as raising and fronting to [i]. However, *o* cannot have been umlauted to a high back rounded [u] while old *u* was left unaltered, since in Middle Welsh final syllables *u* remained unchanged as in *dwuyn* /duvn/ 'world' < **dumnos* whereas umlauted *o* or *u* had been unrounded to high central [ɨ] as in *ych* and *cyrn* above. This suggests that final *i*-affection fronted *u* and raised and fronted *o* to a high central rounded [ʉ]. This sound will have been phonemicised by the loss of final syllables towards the end of the fifth century to produce stage VII below, in which length continued to be phonemically relevant for the pairs *e*/ɛ̄ (or *ē*) and perhaps *o*/ɔ̄ at most.

Stage VII

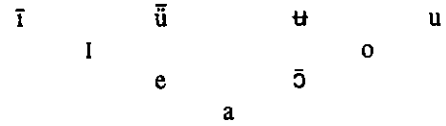


4.1 EMERGENCE OF THE NEW BRITISH SYSTEM. This brings us to the final sequence of developments whereby vowel length became first phonemically redundant and then synchronically predictable throughout. We may begin by noting the following remark about the English vowel shift: 'phonological experience shows that an opposition of quantity rarely survives when it is restricted to two pairs. This duality is abolished by the diphthongisation of the long vowels' (Martinet, 1955, 253).

Absence of length became phonemically irrelevant in the case of short /e/ when its long correlate, whether mid high /ē/ or mid low /ɛ̄/, was diphthongised and thus left the vowel system. These had become the rounded diphthongs /ui/ and /oi/ respectively by the time of Old Welsh, as can be seen from (a) OW *duiu*, MW *dwyw* 'God' < **dēw* < PC **dēwos* < PIE **deywos*, OW *luit*, MW *llwyt*, *llwyd* 'grey', Rom.-Brit. *Leto-cetum* 'Grey-wood' < PC **lētos* (OIr. *líath* 'grey') and (b) OW *coit*, MW *coet*, *koed* 'wood' < **kēto-* < **kaito-*, MW *hoed(y)l* 'life' < **sētlo-* < **saitlo/ā-*. Since, however, placenames borrowed into Anglo-Saxon normally show reflexes of British *e*, Jackson concludes that this rounding had not taken place before well into the seventh century. However, reluctance to date a circumstantial diphthongisation attested in Old Welsh, Cornish and Breton 'later than the time when the three Brittonic languages separated' (*LHEB* 334) led him to follow Förster in positing a sixth-century diphthongisation of *ɛ̄* and *ē* to *ɛ̄i* and *ēi*. In this way the Anglo-Saxon reflexes could be accounted for and a common diphthongal base provided. In Jackson's view the end of Common British is marked by loss of direct land communications between Wales and Southwest England after the Anglo-Saxon advance to the upper Severn estuary around 600 A.D. This is too rigid and probably pays insufficient attention to maritime connections, since even Jackson must admit that a number of identical developments like internal *i*-affection and retraction of the accent actually did take place in Wales, Cornwall and Britanny in the succeeding centuries.

The question of date will be returned to in 4.4 below. What matters for present purposes is that diphthongisation, whether directly to *oi* and *ui* or via *ɛ̄i* and *ēi* at first, removed these phonemes from the plain vowel system (before the middle of the sixth century according to the relative chronology in 4.4), thus eliminating what was probably the last remaining phonemic distinction involving length only. Although length was most likely the sole distinctive feature available to differentiate short *e* from one or other of the two long *e*-phonemes prior to their diphthongisation, this is unlikely to have been the case with *o*/ɔ̄. As pointed out earlier, the long ō (> *ū* > *ʉ̄*) in the tightly symmetrical Proto-British system was probably a mid high back rounded vowel and this creates a presumption that its short counterpart was likewise mid high *o*. The new ɔ̄ from Proto-British *ā* was, by contrast, mid low and, as we shall see, did not fall together with original *o* when shortened in pretonic position. Phonetically, then, *o* and ɔ̄ differed in height as well as length. Consequently height was almost bound to replace length as the phonemically relevant distinctive feature in tandem with the steady decline in length's phonemic significance in the system as a whole. The upshot was the early sixth-century stage below, a vowel system in which length was the phonemically irrelevant concomitant of some articulations but not others.

Stage VIII



4.2 Thereafter the redistribution of the phonetic feature ±*length* responsible for the new quantity system could take place without affecting the phonemic inventory at all.

Penultimate stress became word-final as a result of the extensive loss of final syllables in British around the end of the fifth century (stressed vowel in bold): e.g. (MW *mawr*) **mɔ̄r* 'great' < **mɔ̄rah* < PC **māros*, (MW *byt*) **bɪd* 'world' < **bituh* < PC **bitus*, (MW *trwm*) **trumm* 'heavy' < **trumbah* <PC **trumbos*, (MW *bard*) **barð* 'bard' < **bardah* < PC **bardos*, (MW *gwisc*) **wīsk* 'clothing' < **wīskā*, (MW *llydan*) **ɬɪdan* 'broad' < **Litanah* < PC **litanos*, (MW *Nadolyc*, *Nodolyc*) **nɔ̄dɔ̄lɪg* 'Christmas' < **nɔ̄tɔ̄likyā* < Lat. *nātālicia*, (MW *uchel*) **üx(s)el* 'high' < **ūxselah* < PC **ouxselos*. Three further developments were responsible for the eradication of independent length. Firstly, long pretonic vowels were shortened, whence **nɔdɔ̄lɪg*, **üx(s)el* etc. but unchanged **mɔ̄r*. Secondly, stressed short vowels were lenghtened unless followed by a double consonant or a consonant cluster, whence **bɪd*, **ɬɪd̲ān*, **nɔdɔlī̄g*, **üx(s)ēl* but unchanged **barð*, **trumm*. Thirdly, stressed long vowels were shortened before such consonant groups, whence **wisk* but unchanged **mɔ̄r*. The cumulative result of these three processes, which were not necessarily simultaneous, was a new quantity system in which vowel length or the lack of it had become mere mechanically conditioned allophonic concomitants of stress and syllable shape throughout.

4.2 One development apparently confined to the West British precursor of Welsh was the change of short pretonic *ɪ* and *u* to rounded and unrounded mid central schwa vowels ɵ and ɘ respectively. However, these had fallen together by the end of the Old Welsh period as unrounded schwa, usually written *y* in Middle Welsh: e.g. MW *ynys* [ənɨs] 'island' < **ɪnɪs* < **inissɪ* (OIr. *inis*), MW *tyner* [tənər] 'tender' < **tɪner* < Lat. *tener*, MW *kymar* [kəmar] 'equal, mate' < **kɵmpar* < **kumpar* < Lat. *compar*, MW *ychen* [əxen] 'oxen' < **ɵxen* < **uxen* < **uxsenes*. This weakening (*LHEB* 664-81) should have affected any unstressed short high vowel and so probably took place before the general pretonic shortening of long *ɪ̄*, *ū̄* etc. discussed in the preceding paragraph. It need concern us no further here since, as mere pretonic allophones of short /ɪ/ and /u/, [ə] and [ɵ] did not add to the phonemic inventory.

4.3 As far as the date of the pretonic shortening in open syllables is concerned, Old Irish *Notlaic* 'Christmas' must have been borrowed as /nɔdɔlig/ at some stage later than pretonic shortening of long mid low ɔ̄ in British but after apocope and before syncope in Irish. A date in the first half of the sixth century for this borrowing is indicated by the conventional dating of Primitive Irish apocope and syncope to about the beginning and the middle of the sixth century respectively. Since this is unlikely to be far out, the middle of the sixth century would emerge as a *terminus post quem non* for pretonic shortening in British or rather in Welsh open syllables (4.4).

As pointed out earlier, in Old and Middle Welsh final (i.e. Old Welsh stressed) syllables the reflexes of *ɛ̄*, *ē* and ɔ̄ were the diphthongs *oi* (*oe*), *ui* (*wy*) and *au* (*aw*) respectively. Sims-Williams (1990, 253-4) ascribes this development to pressures generated by the rise of the new quantity system: 'the lengthening of tonic short vowels in V(C) syllables and the shortening of tonic long vowels in VCC syllables resulted in a great increase in the number of vowel phonemes in tonic syllables. Thus in primitive Welsh the old short vowels (other than the solely pretonic ones of course) gave rise to *new long vowels* [ï: e: a: o: u:] and conversely the old long vowels [i: ü:] gave rise to the *new short vowels* [i ü]... The advent of so many new vowels must have put considerable strain on the system. I would suggest that this strain precipitated or confirmed further changes which removed certain old long vowels from the vocalic system and hence from the sphere of the new quantity system in monophthongs: [e:] > [ui], [ɛ:] > [oi], [ɔ:] > [au]. These diphthongizations are treated and dated separately by Jackson, but the dating evidence is not exact enough to oppose a reassessment based on structural considerations... The diphthongization of old [e: ɛ: ɔ:] must therefore be synchronized with, or dated earlier than, the development of the new quantity system'.

Since the new long and short vowels generated in stressed V(C) and VCC syllables respectively were merely allophones in complementary distribution with the corresponding old short and long vowels kept in VCC and V(C) stressed syllables respectively, the new quantity system did not increase the number of vowel phonemes. Moreover, although it is structurally tempting to link the diphthongisation of ɔ̄ with that of *ɛ̄* and *ē*, its restriction to Welsh is worth bearing in mind, since the other two occur in Cornish and Breton as well, and Schrijver's scenario in 4.4 below does in fact make it necessary to date *ē* > *ui* in British before ɔ̄ > *au* in Welsh.

4.4 A form like Middle Welsh *Nodolyc* 'Christmas' and alternations of the type Middle Welsh sg. *brawt*, pl. *broder* 'brother(s)' < **brɔ̄d(r)*, **brɔder* < **brɔ̄d(r)*, **brɔ̄der* show that long ɔ̄ was still a monophthong when pretonic shortening took place. One might argue that, had the same been true of long *ɛ̄* and *ē*, Middle Welsh nouns like *bwyt* 'food' and *coet* 'wood' < **bēd*, **kēd*

should have acquired plurals like **bedeu*, **cedyd* rather than the actually attested *bwydeu*, *coedyd*. The absence of such reflexes would then point to the conclusion that the general British diphthongisation of both *ē* and *ɛ̄* discussed in 4.1 had occurred before the sixth-century pretonic shortening, whereas the Primitive Welsh diphthongisation of stressed long ɔ̄ to *au* seen in OW *braut* < **brɔ̄d*, *maur* < **mɔ̄r*, *marchauc* 'rider' < **marxɔ̄g* (MW *brawt*, *mawr*, *marchawc*) took place after it as Jackson thought (*LHEB* 695 and 697). However, Schrijver (1995, 243-52) has identified a number of likely instances of pretonic shortening of *ē* to *ɪ* such as MW *blyned* 'years' beside *blwyd*, the MW variant *byta* of *bwyta* 'eat' (remodelled from *bwyd* 'food'), MW pl. *morynion* vs. sg. *morwyn* 'maiden' and suggests that the distribution of pretonic *wy* and *y* reflexes can be best explained by restricting the shortening to closed syllables. Contrasts of the type MB *mozreb* reflecting pretonic shortening of ɔ̄ versus *beure* 'morning' based on unshortened ɔ̄ indicate that this too was confined to closed syllables as a pan-British phenomenon. Schrijver then argues that pretonic shortening in open syllables was confined to Welsh and affected ɔ̄, as in MW *bore* 'morning', but not ē because the latter had meanwhile been diphthongised to *ui* but the former had not. This implies the following relative chronology (Schrijver, 1995, 252): (i) pretonic shortening of *ē*, *ɛ̄* and ɔ̄, (ii) diphthongisation of *ē* and *ɛ̄*, (iii) pretonic shortening in Welsh open syllables (by the middle of the sixth century according to 4.3), (iv) Welsh diphthongisation of ɔ̄ to *au*.

It is not possible to date Welsh ɔ̄ to *au* in relation to the lengthening of stressed vowels above. However, English placenames of British origin do provide some evidence, albeit conflicting. New long vowels are found, in Sims-Williams' words, 'in monosyllabic English names as far east as Somerset (Tone), Lancashire (Roose, Leece, Preese), Shropshire (Prees), and even the East Riding of Yorkshire (Roos). Jackson contrasts these with names retaining short vowels stretching as far west as Wiltshire (Biss), Hampshire (Liss), and the West Riding of Yorkshire (Nidd)' (1990, 242). If the derivation of Roose in Lancashire from **Rōs* (W *rhos* 'moor, OIr. *ros* 'wood (esp. on a promontory)' < **rosso/ā-)* is also valid for Roos on the Humber, the latter alone is sufficiently far east to require a sixth- rather than a seventh-century date for the lengthening of stressed vowels. However, it then becomes difficult to understand the survival of short-vowel forms much further west like Ross from the same etymon right over in Herefordshire. On the whole, this derivation of Humberside Roos creates more problems than it solves and must, therefore, be considered uncertain. If so, there is no compelling reason to date the lengthening of stressed vowels to the sixth rather than the seventh century. On the other hand, with the arguable exception of Ross in Herefordshire, none of the short-vowel placenames mentioned need have been borrowed later than

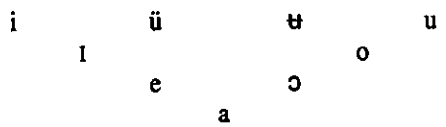
the sixth century.

A further significant datum seems to have been ignored hitherto in discussions of this question, namely the lengthening of short mid high front *ɪ* to long high front *ī* in compensation for a lost voiceless guttural fricative before *t*, as in MW *brith* 'speckled' < **brīt* < **brɪxt* < **brixtos*. If long mid high [ī] had already been brought into existence by allophonic lengthening, the vowel of **brɪxt* would presumably have been lengthened to this sound to yield Middle Welsh **bryth* parallel to *sych* 'dry', as already suggested earlier, instead of actually attested *brith* 'speckled'. If, on the other hand, it had not, then high front *ī* would have been the only front unrounded long vowel available, as a glance at stage VIII above shows. That being so, the mechanical lenghtening of stressed vowels in auslaut or before a single consonant will have occurred after reduction of the cluster *xt* in the late sixth or early seventh century since, to quote Jackson (*LHEB* 411), 'the evidence of inscriptions and place-names shows ... clearly that *xt* lasted until the second half of the sixth century; but cannot be held to prove in any given case that it continued into the seventh'.

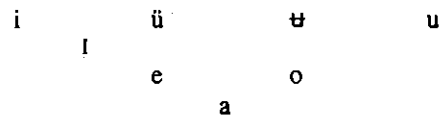
As to the concomitant shortening of stressed vowels before a consonant group, Sims-Williams (1990, 254) is certainly right to insist that Welsh diphthongisation of ɔ̄ to *au* must have preceded this. Otherwise one would expect shortened **sodl*, **Morth* rather than actually attested *sawdl* 'heel', *Mawrth* 'Tuesday, March' < **sɔ̄dl*, **Mɔ̄rt* < **stā-tlo-*, Lat. *(diēs, mensis) Mārtis* with a Welsh diphthong deriving from still long stressed ɔ̄.

4.5 We may, then, conclude that rationalisation of stage VIII was initiated by pretonic shortening in the first half of the sixth century and completed by the shortening of long stressed vowels before consonant groups in the course of the seventh. Diphthongisation of ɔ̄ > *au* belongs somewhere in between, probably the early seventh century, as does the lengthening of stressed vowels not followed by a consonant group. Alternatively, this and the complementary shortening may have been more or less simultaneous. At any rate, the new quantity system cannot properly be said to have come into being until all three of these processes had taken place. Consequently the progression from stage VIII above to the southwestern (> Cornish, Breton) stage IX(a) and the western (> Welsh) stage IX(b) below took quite a long time and was not completed until some point in the seventh century.

Stage IX(a)



Stage IX(b)



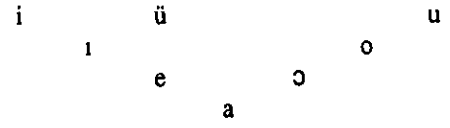
The long and short vowel allophones [a]/[ā] etc. ignored in the above tables of phonemes would seem to have been complementarily distributed along the lines indicated for much of the Old Welsh, Old Cornish and Old Breton periods that are of primary concern here. When, however, the accent was later retracted from the ultimate to the penultimate of polysyllables, newly unstressed final long vowels were shortened and newly stressed penultimate short vowels in open syllables became 'half-long' (here indicated by ˙), whence the [ɬ'ə˙dan] and [nod'o˙lɪg] ultimately reflected in the pronunciation of Modern Welsh *llydan* 'broad' and *Nadolig* 'Christmas'.

The crucial difference between southwestern IX(a) and western IX(b) results from the former's preservation and the latter's loss of the mid low /ɔ/ phoneme (subsequently > /ö/ in SW). Since seventh-century internal *i*-affection fronted and unrounded old short *o* in pretonic syllables in the manner seen in **molɪn* > MW *melin* 'mill', **oṽid* > OW *emid*, MW *euyd* 'bronze' but did not affect the pretonically shortened long vowel in a word like **Nɔdɔlɪg* > MW *Nodolyc*, these two sounds must still have been distinct at that time. However, they fell together subsequently as unstressed *o* in West British and there is no obvious obstacle to synchronising this with the diphthongisation of stressed long ɔ̄ to *au* there. Hence the disappearance of both stressed and unstressed forms of the phoneme by stage IX(b) and before completion of the third and final stage of the new quantity system. In Cornish and Breton, however, /ɔ/ was retained as a separate phoneme, eventually being fronted to [ö].

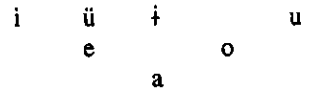
4.6 There remained one last step to be taken in order to remove the preponderance of rounded over unrounded high vowels in stages IX(a) and (b). This was effected by the roughly eighth-century unrounding of high central /ʉ/ to /ɨ/, which then merged with mid high front /ɪ/. However, this merger took place in opposite directions in the two branches, high central /ɨ/ being generalised in Welsh whereas mid high front /ɪ/ triumphed in Cornish and Breton. The result was stages X(a) and X(b) below, both quite balanced in their own ways. The Old Cornish and Old Breton system in X(a) comprised four unrounded (/a/,/e/,/ɪ/,/i/) and four rounded (/ɔ/,/o/,/u/,/ü/) vowel phonemes and displayed an ascending scale of phonemically relevant features on a low-high axis: low /a/ (height only), mid /e//ɪ//ɔ//o/ (height plus front/back or unrounded/rounded), high /i//ü//u/ (height plus front/back plus unrounded/rounded). The seven-vowel system of Old Welsh by contrast opposed three

rounded to three unrounded vowels in addition to unpaired low /a/, had only one pair of mid vowels /e//o/ (height plus front/back or unrounded/rounded), but no less than four high vowels /i//ü//ɨ//u/ (height plus front/central/back plus unrounded/rounded). Given that ʉ > ɨ may not have occurred before the later eighth century as suggested above and logically precedes *ɪ* > ɨ, the latter stage can hardly have been attained before the ninth century. Moreover, although systemic pressures make a fairly rapid eighth- and ninth-century evolution likely, a later date for completion of the process cannot be definitely excluded.

Stage X(a)



Stage X(b)



In conclusion, a series of structurally motivated shifts dramatically transformed a Proto-British vowel system opposing five short to five corresponding long phonemes into various Late British systems from stages VIII to X in which presence or absence of length had become a mechanically conditioned allophonic concomitant of from nine to seven qualitatively distinct vowel phonemes.

Bibliography

Beekes, R.S.P. (1987): 'The PIE Words for 'Name' and 'Me'', *Die Sprache* 33, 1-12

(1995): *Comparative Indo-European Linguistics: An Introduction*. Amsterdam/Philadelphia.

Bergin (1946): '*Ériu* and the Ablaut', *Ériu* 14, 147-53.

Bieler, L. (1979): *The Patrician Texts in the Book of Armagh*. Dublin.

Binchy, D.A. (1956): 'Some Celtic Legal Terms... (2) The Officium Pietatis', *Celtica* 3, 228-31.

(1958): review of Jackson, *LHEB*, in *Celtica* 4, 288-92.

Bot.: see Meid (1993).

Browning, R. (1969): *Medieval and Modern Greek*. London.

Buck, C.D. (1928): *A Grammar of Oscan and Umbrian*. Hildesheim/New York (1979 reprint).

Bynon, T. (1983): *Historical Linguistics*. Cambridge.

Carney, J. (1978/9): 'Aspects of Archaic Irish', *Éigse* 17, 417-35.

Celtib.: M. Lejeune, *Celtiberica* (1955). Salamanca.

Cowgill, W. (1957): 'Old Irish *teoir* and *cetheoir*', *Language* 33, 341-5.

(1967): 'On the fate of **w* in Old Irish', *Language* 43, 129-38.

(1969): 'A Note on Palatalisation in Old Irish', *Festschrift für Konstantin Reichardt*, ed. C. Gellinek and H. Zauchenberger, 30-37. Bern/Munich.

(1975): 'The origins of the Insular Celtic conjunct and absolute verbal endings', *Flexion und Wortbildung, Akten der 5. Fachtagung der Indogermanischen Gesellschaft*, ed. H. Rix, 40-70. Wiesbaden.

(1980): 'The Etymology of Irish *guidid* and the Outcome of **g^{w}h* in Celtic', *Lautgeschichte und Etymologie. Akten der VI. Fachtagung der Indogermanischen Gesellschaft*, ed. M. Mayrhofer, M. Peters, O.E. Pfeiffer, 49-78. Wiesbaden.

Cullen, J. (1972): 'Primitive Irish Vowels in Final Syllables following i̯', *Ériu* 23, 227-9.

de Bernardo Stempel, P. (1987): *Die Vertretung der indogermanischen liquiden und nasalen Sonanten*. Innsbruck.

(1990): 'Einige Beobachtungen zu indogermanische *[sic]* /w/ im Keltischen', *Celtic Language, Celtic Culture. A Festschrift for Eric P. Hamp*, ed. A. Matonis and F. Melia, 26-46. Van Nuys, California.

(1993): 'Probleme der relativen Chronologie: nochmals zu idg. **ǒ* im Keltischen', *Deutschsprachige Keltologen* (see Ködderitzsch, 1993), 37-56.

(1996): 'Die Stummvokale: eine Bilanz für das Keltiberische', *Sprachdenkmäler* (see Koch, 1996), 212-56.

de Simone, C. (1980): 'Gallisch **Nemetio̯s* - etruskisch *Nemetie*', *KZ* 94,

198-203.

(1980b): 'L'aspetto linguistico', *Lapis Satricanus - Archaeological, Epigraphical, Linguistic and Historical Aspects of the New Inscription from Satricum*, ed. C.M. Stibbe, G. Colonna, C. de Simone and H.G. Versnel, 71-94. 'S Gravenhage.

Devine, A.M. (1970): *The Latin Thematic Genitive Singular*. London.

Eichner, H. (1989): 'Damals und heute: Probleme der Erschließung des Altkeltischen zu Zeußens Zeit und in der Gegenwart', *Erlanger Gedenkfeier für Johann Kaspar Zeuß*, ed. B. Forssman, 9-56. Erlangen.

EIV: K. McCone, *The Early Irish Verb* (1987). Maynooth.

Ellis Evans, D. (1967): *Gaulish Personal Names*. Oxford.

Eska, J. (1989): *Towards an Interpretation of the Hispano-Celtic Inscription of Botorrita*. Innsbruck.

(1995): 'Observations on the Thematic Genitive Singular in Lepontic and Hispano-Celtic', *Hispano-Gallo-Brittonica. Essays Presented to Professor D. Ellis Evans on the Occasion of his Sixty-Fifth Birthday*, ed. J. Eska, R. Geraint Gruffydd and N. Jacobs, 33-46. Cardiff.

(1995b): 'Language Update: Celtic, Recent Developments in Continental Celtic', *UCLA Friends and Alumni of Indo-Euorpean Studies Newsletter* V(1), 13-4.

Esposito, M. (1957): 'The Patrician Problem and a Possible Solution', *Irish Historical Studies* 10, 131-55.

Gippert, J. (1992): *Ogam: Eine frühe keltische Schrifterfindung*. Prague.

GMW: D. Simon Evans, *A Grammar of Middle Welsh*. Dublin.

Godel, R. (1975): *An Introduction to the Study of Classical Armenian*. Wiesbaden.

GOI: R. Thurneysen, *A Grammar of Old Irish* (1946). Dublin.

Goto, T (1985): 'Altindisch *rándhra-* und uridg. **lendʰ*', *MSS* 44, 77-91.

Greene, D. (1956): 'Gemination', *Celtica* 3, 284-9.

(1960): 'Some Problems of Irish Phonology', *Celtica* 5, 103-6.

(1962): 'The Colouring of Consonants in Old Irish', *Proceedings of the Fourth International Conference of Phonetic Sciences*, ed. A. Sovijärvi and P. Aalto, 622-4. The Hague.

(1966): 'The Spirant Mutation in Brythonic', *Celtica* 7, 116-9.

(1967): 'Provection and *Calediad*', *Studia Celtica* 10/11, 101-4.

(1973): 'The Growth of Palatalization in Irish', *TPS* '73, 127-36.

(1974): 'Distinctive Plural Forms in Old and Middle Irish', *Ériu* 25, 190-99.

(1976): 'The Diphthongs of Old Irish', *Ériu* 27, 26-45.

Hamp, E. (1965): 'Evidence in Keltic', *Evidence for Laryngeals*, ed. W. Winter, 224-35. The Hague.

(1974): 'The MacNeill-O'Brien Law', *Ériu* 25, 172-80.

(1975): 'Varia Etymologica, (1) Welsh *ffriw*, *ewin*, *tafod*, and Labio-velars', *EC* 14, 441-6.

Harvey, A. (1984): 'Aspects of Lenition and Spirantization', *Cambridge Medieval Celtic Studies* 8, 97-100.

(1985): 'The Significance of *Cothraige*', *Ériu* 36, 1-9.

(1987): 'The Ogam Inscriptions and their Geminate Consonant Symbols', *Ériu* 38, 45-71.

(1989): 'Some Significant Points of Early Insular Celtic Orthography', *Sages, Saints and Storytellers: Celtic Studies in Honour of Professor James Carney*, ed. D. Ó Corráin, L. Breatnach and K. McCone, 56-66. Maynooth.

Hoenigswald, H.M. (1973): 'Indo-European *p in Celtic and the claims for a relative chronology', *JIES* 1, 324-9.

IEW: J. Pokorny, *Indogermanisches etymologisches Wörterbuch* (1959). Bern.

Jackson, A.V.W. (1892): *An Avesta Grammar in Comparison with Sanskrit. Part I - Phonology, Inflection, Word-formation*. Stuttgart.

Jackson, K.H. (1960): 'Gemination and the Spirant Mutation', *Celtica* 5, 127-34.

(1967): *A Historical Phonology of Breton*. Dublin.

Jenkins, D. and Owen, M.E. (1984): 'The Welsh Marginalia in the Lichfield Gospels Part II: The 'Surrexit' Memorandum', *Cambridge Medieval Celtic Studies* 7, 91-120.

Joseph, L. (1982): 'The Treatment of CR̥H- and the Origin of CaRa- in Celtic', *Ériu* 33, 32-57.

(1990): 'Old Irish *cú*: a Naïve Reinterpretation', *Celtic Language, Celtic Cultur. A Festschrift for Eric P. Hamp*, ed. A. Matonis and D. Melia, 110-30. Van Nuys, California.

Klingenschmitt, G. (1978): 'Zum Ablaut des indogermanischen Kausativs', *KZ* 92, 1-13.

Koch, J.T. (1990): '**Cothairche*, Esposito's Theory and Neo-Celtic Lenition', *Britain 400-600: Language and History*, ed. A. Bammesberger and A. Wollmann, 179-202. Heidelberg.

(1992): 'Gallo-Brittonic *Tasc(i)ouanos* "Badger-slayer" and the Reflex of Indo-European *g"h*', *Journal of Celtic Linguistics* 1, 101-18.

(1992b): '"Gallo-Brittonic" vs. "Insular Celtic": The Inter-relationships of the Celtic Languages Reconsidered', *Bretagne et pays celtiques - langue, histoire, civilisation. Mélanges offerts à la memoire de Léon Fleuriot*, ed. G. Le Menn, 471-95. Saint-Brieuc/Rennes.

(1996): 'Some Thoughts on the Gaulish Inscription of Larzac', *Die größeren altkeltischen Sprachdenkmäler*, ed. W. Meid and P. Anreiter, 37-40. Innsbruck.

Ködderitzsch, R. (1993): 'Keltisch und Thrakisch', *Akten des ersten Symposiums deutschsprachiger Keltologen*, ed. M. Rockel and S. Zimmer, 139-57. Tübingen.

Kortlandt, F. (1979): 'The Old Irish Absolute and Conjunct Endings and Questions of Relative Chronology', *Ériu* 30, 35-53.

(1982): 'Phonemicization and Rephonemicization of the Old Irish Mutations', *Ériu* 33, 73-83.

Lam.: P.-Y. Lambert, *La langue gauloise: Description linguistique, commentaire d'inscriptions choisies* (1994). Paris.

Lar.: M. Lejeune et al., 'Textes gaulois et gallo-romains en cursive latine: 3. Le plomb du Larzac', *EC* 22 (1985), 95-177.

LEIA: J. Vendryes (, E. Bachellery and P.-Y. Lambert), *Lexique étymologique de l'irlandais ancien* (1959-). Dublin and Paris.

Lej.: M. Lejeune, 'Documents gaulois et para-gaulois de Cisalpine', *EC* 12 (1970), 357-500.

Lejeune, M. (1972): *Phonétique historique du mycénien et du grec ancien*. Paris.

Lenormand, M (1952): 'The Phonemes of Lifu (Loyalty Islands); the Shaping of a Pattern', *Word* 8, 252-9.

Lewis, H. (1991): *Handbuch des Mittelkornischen*. Innsbruck. (translation by S. Zimmer of *Llawlyfr Cernyweg Canol*, 2nd. ed. 1946, Cardiff).

Lewis, H. and Pedersen, H. (1937): *A Concise Comparative Celtic Grammar*. Göttingen.

LHEB: K.H. Jackson, *Language and History in Early Britain* (1953). Edinburgh.

Lindsay, W. M. (1912): *Early Welsh Script*. Oxford.

Littlewood, R.P. (1979): *Living Spanish*. Sevenoaks.

Mac Eoin, G. (1986): 'The Celticity of Celtic Ireland', *Geschichte und Kultur der Kelten*, ed. K.H. Schmidt, 161-74. Heidelberg.

Martinet, A. (1952): 'Celtic Lenition and Western Romance Consonants', *Language* 28, 192-217.

(1955): *Économie des changements phonétiques*. Bern.

Mayrhofer, M. (1986): *Indogermanische Grammatik I.2: Lautlehre*. Heidelberg.

McCone, K. (1978): 'The Dative Singular of Old Irish Consonant Stems', *Ériu* 29, 26-38.

(1979): 'Pretonic Preverbs and the Absolute Verbal Endings in Old Irish', *Ériu* 30, 1-34.

(1981): 'Final /t/ to /d/ after Unstressed Vowels and an Old Irish Sound Law', *Ériu* 32, 29-44.

(1982): 'Further to Absolute and Conjunct', *Ériu* 33, 1-29.

(1985): 'OIr. *Olc, Luch* and IE **wl̥k"os, *luk"os* "wolf"', *Ériu* 36, 171-6.

(1985b): 'The Absolute and Conjunct Verbal Inflection in Old Irish', *Grammatische Kategorien, Funktion und Geschichte, Akten der VII. Fachtagung der Indogermanischen Gesellschaft*, ed. B. Schlerath, 261-70. Wiesbaden.

(1985c): 'The Würzburg and Milan Glosses: Our Earliest Sources of 'Middle Irish'', *Ériu* 36, 85-106.

(1986): 'From Indo-European to Old Irish: Conservation and Innovation in the Verbal System', *Proceedings of 7th. International Congress of Celtic Studies*, ed. D. Ellis Evans, J.G. Griffith and E.M. Jope, 222-66. Oxford.

(1989): 'Zur Frage der Register im frühen Irischen', *Early Irish Literature - Media and Communication. Mündlichkeit und Schriftlichkeit in der frühen irischen Literatur*, ed. S.N. Tranter and H.L.C. Tristram, 57-97. Tübingen.

(1991): 'The PIE Stops and Syllabic Nasals in Celtic', *Studia Celtica Japonica* 4, 37-69.

(1991b): *The Indo-European Origins of the Old Irish Nasal Presents, Subjunctives and Futures*. Innsbruck.

(1991c): 'The Inflection of OIr. *bó* 'Cow' and the Etymology of *Buchet*', *Ériu* 42, 37-44.

(1992): 'Relative Chronologie: Keltisch', *Rekonstruktion und relative Chronologie, Akten der VIII. Fachtagung der Indogermanischen Gesellschaft, Leiden 1987*, ed. R. Beekes, A. Lubotsky and J. Weitenberg, 11-39. Innsbruck.

(1992b): 'OIr. *aub* 'River' and *amnair* 'Maternal Uncle'', *MSS* 53, 101-11.

(1993): 'Zisalpinisch-gallisch *uenia* und *lokan*', *Sprachen und Schriften des antiken Mittelmeerraums: Festschrift für Jürgen Untermann zum 65. Geburtstag*, ed. F. Heidermanns, H. Rix and E. Seebold, 243-9. Innsbruck.

(1993b): 'Old Irish 'Three' and 'Four': A Question of Gender', *Ériu* 44, 53-73.

(1993c): 'Old Irish *co, cucci* 'as far as (him, it)' and Latin *usque* 'as far as'', *Ériu* 44, 171-6.

(1994): 'Zum Ablaut der keltischen *r*-Stämme', *In honorem Holger Pedersen, Kolloquium der Indogermanischen Gesellschaft vom 26. bis 28. März 1993 in Kopenhagen*, ed. H.E. Rasmussen, 275-84. Wiesbaden.

(1995): 'Der Präsens Indikativ der Kopula und die Relativendung *-s* im Altririschen', *Verba et Structurae, Festschrift für Klaus Strunk zum 65. Geburtstag*, ed. H. Hettrich, W. Hock, P.-A. Mumm and N. Oettinger, 123-33. Innsbruck.

(1995b): 'OIr. *senchae, senchaid* and Preliminaries on Agent Noun Formation in Celtic', *Ériu* 46, 1-10.

(1996): 'Der Teller von Lezoux', *Sprachdenkmäler* (see Koch, 1996),

107-17.

(forthcoming): 'Old Irish *do:uccai, do:ratai*', ΣΤΕΦΑΝΩΜΑ, *Gedenkschrift für Jochem Schindler*, ed. H. Eichner and A. Luschitsky. Prague.

(forthcoming b): 'Delbrück's Model of PIE Word Order and the Celtic Evidence', *Berthold Delbrück y la sintaxis indo-europea hoy. Kolloquium der Indogermanischen Gesellschaft, Madrid 21-4 September, 1994*, ed. J.L. García Ramón. Madrid.

(forthcoming c): 'Prehistoric, Old and Middle Irish', *Progress in Irish Studies*, ed. K. McCone and K. Simms. Maynooth.

McManus, D. (1983): 'A Chronology of the Latin Loan-words in Early Irish', *Ériu* 34, 21-71.

(1984): 'On Final Syllables in the Latin Loan-words in Early Irish', *Ériu* 35, 137-62.

(1986): 'Ogam: Archaising Orthography and the Authenticity of the Manuscript Key to the Alphabet', *Ériu* 37, 1-31.

(1991): *A Guide to Ogam*. Maynooth.

(1992): 'On the Vocalism of Old Irish *crann*', *Ériu* 43, 205-6.

Meid, W. (1993): *Die erste Botorrita-Inschrift: Interpretation eines keltiberischen Sprachenkmals*. Innsbruck.

(1994): *Celtiberian Inscriptions*. Budapest.

Meillet (1937): *Introduction à l'étude comparative des langues indo-européennes* (8th. ed.). Paris.

Michelena, L. (1995): 'The Ancient Basque Consonants', *Towards a History of the Basque Language*, ed. J.I. Hualde, J.A. Lakarra and R.L. Trask, 101-35 (English translation of 1957 original in Spanish). Amsterdam/Philadelphia.

MLH: J. Untermann, *Monumenta Linguarum Hispanicarum* (1975-). Wiesbaden.

Morris Jones, J. (1931): *A Welsh Grammar - Historical and Comparative*. Oxford.

O'Rahilly, T.F. (1932): *Irish Dialects Past and Present with Chapters on Scottish and Manx*. Shannon (reprinted 1972, Dublin).

Palmer, L.R. (1954): *The Latin Language*. London.

Penny, R. (1991): *A History of the Spanish Language*. Cambridge.

Prosdocimi, A. (1986): 'L'inscrizione leponzia di Prestino: vent'anni dopo', *ZCP* 41, 225-50.

Pwyll: R.L. Thomson, *Pwyll Pendeuic Dyuet* (1957). Dublin.

RIG: *Recueil des inscriptions gauloises*, ed. P.-M. Duval. Paris. I *Textes gallo-grecs*, ed. M. Lejeune (1985), II *Textes gallo-étrusques, textes gallo-latins sur pierre*, ed. M. Lejeune (1988).

Rix, H. (1970): 'Anlautender Laryngal vor Liquida oder Nasalis Sonans im Griechischen', *MSS* 27, 79-110.

(1977): 'Das keltische Verbalsystem auf dem Hintergrund des indo-iranisch-griechischen Rekonstruktionsmodells', *Indogermanisch und Keltisch*, ed. K.H. Schmidt, 132-58. Wiesbaden.

Russell, P. (1985): 'A Footnote to Spirantization', *Cambridge Medieval Celtic Studies* 10, 53-6.

(1988): 'The Celtic Preverb **uss* and Related Matters', *Ériu* 39, 95-126.

(1995): *An Introduction to the Celtic Languages*. London/New York.

Schindler, J. (1966): 'Bemerkungen zum idg. Wort für "Schlaf"', *Die Sprache* 12, 67-78.

(1977): 'A Thorny Problem', *Die Sprache* 23, 25-35.

(1977b): 'Notizien zum Sieverschen Gesetz', *Die Sprache* 23, 56-65.

Schmidt, K.H. (1977): *Die festlandkeltischen Sprachen*. Innsbruck.

(1980): 'On the Celtic Languages of Continental Europe', *BBCS* 28, 189-205.

(1986): 'Zur Rekonstruktion des Keltischen. Festlandkeltisches und inselkeltisches Verbum', *ZCP* 41, 159-79.

(1988): 'Zu den phonologischen Differenzierungsmerkmalen in den keltischen Sprachen', *Studia Celtica Japonica* 1, 1-12.

(1988b): 'On the Reconstruction of Proto-Celtic', *Proceedings of 1st. North American Congress of Celtic Studies*, ed. G.W. MacLennan, 231-48. Ottawa.

(1990): 'Late British', *Britain 400-600* (see Sims-Williams), 121-48.

Schmitt, R. (1977): *Einführung in die griechischen Dialekte*. Darmstadt.

Schmoll, U. (1959): *Die Sprachen der vorkeltischen Indogermanen Hispaniens und das Keltiberische*. Wiesbaden.

Schrijver, P. (1991): 'The Development of Primitive Irish **aN* before Voiced Stop', *Ériu* 42, 13-25.

(1992) 'The Chronology of the Loss of Post-posttonic Vowels between Identical Consonants and the Origin of the Celtic First Person Singular Imperfect', *MSS* 53, 179-96.

(1993): 'On the development of Vowels before Tautosyllabic Nasals in Primitive Irish', *Ériu* 44, 33-52.

(1993b): 'OIr. *dëec, dëac*', *Ériu* 44, 181-4.

(1994): 'The Celtic Adverbs for "Against" and "With" and the Early Apocope of **-i*', *Ériu* 45, 151-89.

(1995): *Studies in British Celtic Historical Phonology*. Amsterdam/Atlanta.

(forthcoming): 'OIr. *gor* "pious, dutiful": Meaning and Etymology', *Ériu* 47.

SEG: *Supplementum Epigraphicum Graecum*. Amsterdam.

Sims-Williams, P. (1982): 'The Development of the Indo-European Voiced

Labiovelars in Celtic', *BBCS* 29, 201-29.

(1990): 'Dating the Transition to Neo-Brittonic: Phonology and History, 400-600', *Britain 400-600: Language and History*, ed. A. Bammesberger and A. Wollmann, 217-61. Heidelberg.

SnaG: *Stair na Gaeilge in Ómós do P(h)ádraig Ó Fiannachta*, ed. K. McCone, D. McManus, C. Ó Háinle, N. Williams and L. Breatnach (1994). Maynooth.

Stüber, K. (1996): *Zur dialektalen Einheit des Ostionischen*. Innsbruck.

Szemerényi, O. (1973): 'Marked-Unmarked and a Problem of Latin Diachrony', *TPS* '73, 55-74.

(1974): 'A Gaulish Dedicatory Formula', *KZ* 88, 46-86.

(1989): *Einführung in die vergleichende Sprachwissenschaft*. Darmstadt (3rd ed.).

Thes.: W. Stokes and J. Strachan, *Thesaurus Palaeohibernicus* (1901-3). Cambridge.

Thurneysen, R. (1933): 'Colmān mac Lēnēni und Senchān Torpēist', *ZCP* 19, 193-209.

Uhlich, J. (1993): 'Die Reflexe der keltischen Suffixvarianten *-i̯o- vs. *-ii̯o- im Altirischen', *Deutschsprachige Keltologen* (see Ködderitzsch 1993), 353-70.

(1995): 'On the Fate of Intervocalic *-w-* in Old Irish, especially between Neutral Vowels', *Ériu* 46, 11-48.

Vendryes, J. (1955): '*Neddamon delgu linda*', *EC* 7, 9-15.

Vennemann, T. (1989): ed., *The New Sound of Indo-European*. Berlin/New York.

Villar, F. (1993): 'Las sibilantes en celtibérico', *Lengua y Cultura en la Hispania Prerromana. Actas del V Coloquio sobre languas y culturas prerromanas de la Peninsula Ibérica*, ed. J. Untermann and F. Villar, 773-818. Salamanca.

(1995): *Estudios de celtibérico y de toponomia prerromana*. Salamanca.

(1995b): *A New Interpretation of Celtiberian Grammar*. Innsbruck.

VKG: H. Pedersen, *Vergleichende Grammatik der keltischen Sprachen* (1909-13). Göttingen.

Watkins, C. (1954): review of *LHEB*, *Language* 30, 513-8.

(1955): 'The Phonemics of Gaulish: the Dialect of Narbonensis', *Language* 31, 9-19.

(1963): 'Preliminaries to a Historical and Comparative Analysis of the Syntax of the Old Irish Verb', *Celtica* 6, 1-49.

(1966): 'The Origin of the *f*-Future', *Ériu* 20, 67-81.

(1976): 'The Etymology of Irish *dúan*', *Celtica* 11, 270-7.

Watkins, T. Arwyn (1966): 'Points of Similarity between Old Welsh and Old Irish Orthography', *BBCS* 21, 135-41.

(1974): 'The Accent in Old Welsh - its Quality and Development', *BBCS* 24, 1-11.

Ziegler, S. (1994): *Die Sprache der altirischen Ogam-Inschriften*. Göttingen.

Index Verborum Celticorum

IRISH
Ogam in small caps, lower case Old or Middle Irish.

BRITISH

Old or Middle Welsh unless stated otherwise: O = Old, M = Middle, Mod = Modern; W = Welsh, C = Cornish, B = Breton; AB = Ancient (Romano-)British.

GAULISH

CELTIBERIAN