Sound change and typological shift
Initial mutation in Celtic

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Abstract. In the course of the development of Celtic a system of phonetic sandhi phenomena were functionalized and have come to be central to the morphology of all the present-day Celtic languages. These phenomena are seen here in direct relation to the loss of inherited inflectional endings and as an attempt to compensate for the attrition of the morphology. The result has been a typological realignment which has been maintained despite later changes which shifted the system somewhat. By examining a number of parallel cases the position of the Celtic languages, particularly Irish, is put into perspective.

1   Introduction

Pitch and stress accent. One of the most prevailing characteristics in the phonetic makeup of languages is the presence of accented syllables as opposed to non-accented ones. The contrast between the two types involves acoustic prominence, the alternation of accented and non-accented syllables providing rhythmic patterns for phrases and sentences. Acoustic prominence can be achieved in a variety of ways as is attested by present-day languages. Basically there are three variable parameters: relative loudness, length or pitch of accented syllables. Of these loudness and length would appear to go together with pitch representing a different means of realizing acoustic prominence. In pitch-accent systems the contrast between accented and non-accented syllables is achieved by a higher frequency for the accented syllable than for all other syllables in a word. This peak is sufficient to mark off the accented syllable from all others. A correlation of this type of acoustic foregrounding is that there is no necessary reduction in the phonetic quality of non-accented syllables. Such a system can be observed in present-day Finnish which has a strong pitch accent on the first syllable of words and a low and level pitch for all other syllables. There is no phonetic reduction of later syllables in a word, a fact which of importance for Finnish as an agglutinative language with many inflections occurring on the right of word forms. Seen diachronically, this pitch accent has meant that Finnish has not been subject to the loss of inflectional endings so characteristic of most of the Indo-European languages.

     A system in which loudness and length are used to realize the acoustic prominence of accented syllables is termed a stress-accent system and tends to evince different behaviour diachronically. Recall that acoustic prominence is a relative phenomenon so that languages show variation in degree and not in kind between accentually different syllables. This means that any non-accented syllable in a stress-accent system will be shorter and quieter than a corresponding accented syllable. This leads to a tendency to weaken non-accented syllables and, viewed diachronically, results in a loss of inflectional endings, assuming that these are non- accented.

It would appear to hold for Indo-European that there was a change from pitch-accent to stress-accent type in a period preceding first attestations for most sub- groups. With some pitch-accent can still be noted, e.g. in Hellenic, but for others, such as Germanic, only the reflexes of variable pitch-accent can be observed. In the latter the operation of Verner's Law assumes at least a variable accent and of course ablaut itself is assumed to be the result of pitch differences between syllables which were exploited chiefly in the verbal system.

The mention of Verner's Law is a signal to make a further distinction in accentual systems. The nature of accent in a language is distinct from the placing of accent. The latter concerns what syllables can receive stress. There are two types: a fixed-accent and a variable-accent system. Within the Indo-European context Russian can be mentioned as a language which still has a variable-accent system and uses stress-accent to realize this. In such a language this system can result in stressed inflectional endings. Fixed-accent systems show more variation in type. The clearest case is where a language has adopted a prosodic pattern with fixed-stress on lexical stems, typically the first syllable of a word, e.g. Celtic and Germanic. This pattern does not necessarily apply to all languages in a group, witness Polish with penultimate stress or Czech with initial stress. Languages may furthermore make accent placement dependent on syllable-structure characteristics as is the case in English, at least for the Romance section of the lexicon, leading to different accentuation within a word depending on syllable weight. Different patterns may also arise in languages through borrowing as in German which has final accent on many Romance loans or penultimate accent on Latinate borrowings.

Returning to the typical Celtic or Germanic type with strong stress-accent on the first syllable of lexical stems one can note that this has led diachronically to a weakening of later syllables in word forms, these nearly always being inflectional endings (Lehmann, 1992:214). The attrition of these phonetically weakened syllables has lead in the course of a long development to a typological change in both Indo-European subgroups. The extent of this change varies and there is little consensus about the reasons why its manifestation should be greater in one language than in another. English has undergone a considerable typological shift towards an analytic type, far more than German. In this connection one can note that the phonetic reduction of non-accented syllables is greater in English than in German, consider forms such as English *sofa* /sˈəʊfə/ and *canal* /kəˈnɑːl/ vs. German *Sofa* /ˈzoːfa/ and *Kanal* /kaˈnaːl/ in which the low unstressed vowel is retained in the latter but reduced to schwa in the former. Such differences if they applied in previous stages of the languages would help to account for the different development in both.

The kind of typological shift which a language undergoes can vary greatly. The conventional division into synthetic and analytic shows too little differentiation to account for attested developments within Indo-European. Even if a language retains a basically inflectional type there can be considerable changes in the morphology which necessitate a more refined terminology. For the Celtic languages one can note typological change which is not found in the remaining Indo- European languages. As with the other languages which changed their type the shift was triggered by the general loss of inflectional endings but the resulting type is unique. Nonetheless one can locate the source of this change in phonetic phenomena which are widely attested and then consider how the Celtic languages have utilized phonetic variation to compensate for the loss of morphological differentiation.[1]

1.1   What are mutations?

The concern of the remainder of this paper is with the system of initial mutations which arose in the course of the history of the Celtic languages. To start with a definition is called for. Basically an initial mutation is a change in the beginning of a word induced by another word which precedes it. The words affected are usually lexical stems: nouns, adjectives, verbs, etc. The words affecting the mutation are usually grammatical words: articles, pronouns, particles of various types.[2] The mutation involved usually only affects consonants and leads in the main to a change in the manner of articulation, changes in place may also be concomitant on the mutation, though less rarely so. A simple example of such a mutation would be the definite article of feminine nouns or a qualifying particle used with an adjective in Modern Irish.

(1)   a.   *cáin*   /kɑ:n/   'tax'
              an cháin   /ən xɑ:nʲ/   'the tax'
       b.   *beag*   /bʲag/   'small'
              an-bheag   /anʲvʲag/   'very small'
              ró-bheag   /ro:vʲag/   'too small'

From a synchronic point of view one must distinguish instances where the element which causes the mutation is still present and those where this is not the case. For instance with past forms of verbs in Modern Irish the leniting particle *do* is no longer present before the verb form but lenition remains as a reflex of the mutation which this particle triggered.[3]

(2)   *brisim*   /bʲrʲɪsʲɪmʲ/   'I break'
       bhris mé   /vʲrʲɪsʲ me:/   'I broke'

1.2   Status of segments

When analyzing the sound system of Irish it becomes obvious that certain segments only occur as the result of a mutation. For instance the voiced velar fricative is always the product of leniting a velar or dental stop, i.e. /ɣ/ ← /g,d/ + lenition. I have chosen to term these segments 'dependent' as they are dependent on the operation of a mutation. Those which do not rely on mutation are designated 'independent'. All non-nasal stops in Irish, for instance, are independent segments. All nasals, bar /ŋ/, are also independent. One must add at this point that the present classification refers to the occurrence of segments in word- initial position.

The status of fricatives in Irish is one which requires comment with regard to the above classification. Of all of them /h/ is the easiest. This is a dependent segment as it never occurs initially in a non-mutated word. /s/ is an independent segment which is found abundantly in initial position in Irish. /f/ is also independent, although it is not as frequent in non-mutated lexical stems as /s/.[4] Now the behaviour of both on lenition and nasalization must be interpreted in the light of their status as independent segments. Consider lenition first of all. This consists of fricativizing stops in Irish. If the input segment itself is a fricative then the output must be either a further fricative or zero. Note that it is not possible for a fricative to be plosivized on lenition. This would be

strengthening which is only attested as provection in Breton and is quite separate there from the lenition mutation. For Irish the shift is from /s/ to /h/ which is inkeeping with a common step on a lenition scale for /s/. The fricative /f/ disappears on lenition.5 The development of /h/ as the lenited form of /f/ would have been conceivable. There is no prohibition in Irish on lenition leading to homophony, witness /ɣ/ which results from both /d/ and /g/ on lenition. Furthermore there are other languages in which weakening of /f/ produces /h/, cf. Spanish *harina* from Latin *farina*, 'flour'. The zero realization for lenited /f/ in Irish does conform, however, to the historical treatment of labials subject to weakening in Celtic, i.e. to the loss of IE *p*.

The independent fricatives show differences with respective to nasalization. /f/ is voiced to /v/ (often [w] phonetically) much on the lines of other voiceless obstruents whereas /s/ remains unchanged. Recall that within the group of Celtic languages Breton is the only one with a voiced sibilant /z/ or /ʒ/.

In the various Celtic languages there are different mutations or similar ones with different manifestations. These will be enumerated and discussed presently. First of all some historical remarks on the origin of mutation are called for.

2   Divisions within Celtic

Before discussing the development in the Celtic languages it is necessary to introduce some nomenclature required for such a discussion. To begin with Proto- Celtic is the stage at which Celtic separated from the remaining Indo-European dialects. Unlike Germanic there is no single major linguistic change which marks the initial stage of Celtic as a separate branch, i.e. there is no equivalent in Celtic to the Germanic sound shift.6 However there are a number of features which are common to all Celtic languages which are assumed to be inherited from the earliest stage of the branch. The most prominent of these features is the loss of IE *p* in all positions except adjacent to a homorganic obstruent (*t,n,s* Hamp, 1951:230). This involved the weakening and final deletion of the labial plosive. Most authors assume that this is an articulatory weak position anyway (Sommerfelt, 1962:347). Inasmuch as labial articulation does not involve the tongue there may be some truth to this claim. Furthermore one could refer to loss of *p* elsewhere in Indo-European, in Armenian, where it disappeared as part of a series of shifts from stop to fricative roughly on the lines of the Germanic sound shift. However, there was probably a general leniting quality to early Celtic anyway (the ultimate source of later lenition) which would have encompassed the labial plosive. Recall furthermore that Indo-European *b*, which would have formed a plosive pair with *p* and thus added stability to the latter, is a sound which probably did not exist anyway. Adhering to the glottalic theory (Hopper, 1973; Gramkrelidze and Ivanov, 1983), i.e. that *b* would have been an ejective, does not result in a labial plosive pair, but may account typologically for the lack of *b* which is interpreted as /p'/, i.e. not /b/ (Greenberg, 1970: 127; Gamkrelidze and Ivanov, 1973:154f.).

Continental Celtic (Eska and Evans, 1993:26-43) is a term which is given to Celtic as spoken chiefly in Gaul and on the Iberian Peninsula (Tovar, 1961:76-90). From the few inscriptions one can say that the language, which was probably introduced to the Iberian peninsula from 850 BC onwards (Tovar, 1961:78), was more archaic than later forms of the languages. One of the main features is that the language retained IE labio-velars and did not lose IE *p*. Both Tovar (1961:80) and Lejeune (1955) are of the opinion that lenition existed in Celtiberian although the evidence is scanty.

The term 'Gaulish' refers to that variety of Continental Celtic which is attested

from inscriptions up to the first few centuries AD. For comparative Celtic studies Gaulish has a certain referential value as it illustrates a stage of the language which is prior to both forms of Celtic which developed on the British Isles. At this stage the common language was still inflectionally complex as the Gaulish inscriptions attest (Schmidt, 1957; Gray, 1944).

By Insular Celtic one means that form of Celtic spoken on the British Isles. It falls into two groups, P-Celtic or Brythonic and Q-Celtic or Goedelic. The latter branch is confined to Ireland, the Isle of Man (now extinct) and Scotland where Irish immigrants moved in the early centuries of our era bringing their language with them. Breton is a form of Brythonic which arose due to emigration to Brittany by speakers of Celtic in the south-west of Britain as a consequence of the Germanic invasions which set in in earnest as of the mid-fifth century AD.

P- and Q-Celtic. These designations derive from the treatment of original /kʷ/ in Brythonic and Goedelic (Schmidt, 1993). In the latter the inherited sound is retained whereas in Brythonic and Gaulish /p/, a consonant originally lost in all Celtic languages, was regained by the shift of /kʷ/ to /p/ as in Old Welsh *map* (→ Modern Welsh *mab*) and Irish *mac* /-k/ 'son'; Modern Welsh *penn* /pɛn/ and Modern Irish *ceann* /kɑːn/ 'head'. Irish later reintroduces the bilabial stop via Latin loans like *pian* 'pain' or *póg* 'kiss' (< *pacis*) and still later via Anglo-Norman loan-words like *píosa* 'piece' or *pláta* 'plate'. Note that the closing of a labial element to a stop had a precedent in the shifting of IE *gʷ* to /b/ in Celtic, cf. Old Irish *ben* 'woman' < IE *gʷena*; compare Old Irish *béo* 'alive' and Latin *vivos* (Thurneysen, 1946:117).

Hamp (1958:211) assumes that *p* and *k* were allophones of each other at an early stage. However Hamp offers little evidence for his view beyond his own assertion of it. He should at least have produced some present-day case or one clearly attested historically instance in which *p* and *k* are allophonic, i.e. without systematic distinctiveness.

McManus (1984:186f.) sees the main body of early Latin loans (the so-called *Cothrige* words after an early form of the name *Patricius*) before 500 AD as showing the shift from *p* to *k* (*puteus > cuithe* 'well', *planta > cland* 'children', the latter probably via another variety of Celtic as it shares the meaning 'children' with Brythonic, O'Rahilly (1957)).[7] After the mid 6th century the *Pátraic* loans enter the language with which there is no further shift of labial to velar place of articulation. There would appear to be a shift from *f* to *s* judging by words such as *fenestra* to *senester*,[8] later replaced by the Scandinavian word *vindauga* (as in English) which renders present-day *fuinneog* 'window'.

Following Sarauw (1900) McManus (1984:179) maintains that Latin *p* was replaced by *kʷ* in Irish as long as a labialized version of the velar stop existed in the language. By the Old Irish period *kʷ* had been simplified to *k* so that there was no native labial or labialized voiceless stop hence Latin *p* was retained in later loan-words. With those loans in the Primitive Irish period (before 500 AD) Latin *t* and *k* appear as /θ/ and /x/ respectively. Later loans have voiced stops instead of fricatives for dental and velar stops: *paiter* /-d-/ < *pater* 'father' and *póc* /-g/ < *pacis* 'kiss'.

O'Rahilly (1957:80f.) maintains that the naturalization of **p* was facilitated by the fact that in the 5th century a Hiberno-Brythonic type of dialect was still spoken in Ireland which, being Brythonic, would have had **p*.

2.1 Gaulish

The arrival of Celts in Britain can be assumed to have taken place in the 5th to 4th century BC. By the end of the 2nd century BC the Romans had begun to expand into Gaul with the suppression of Celtic. The scant linguistic remains in Gaulish (Fowkes, 1940; Gray, 1944) are largely onomastic: inscriptions and references in classical sources.

Gaulish still maintained many of the inherited inflectional endings, particularly in the nominal area, e.g. for nominative singular of nouns as evidenced in the following forms.

(3)   Gaulish   Irish   Welsh
        /-os/ *cattos*   *cat*   *cath*   'cat'
        /-on/ *dúnon*   *dún*   *din*   'castle'

Relative chronology of syncope and apocope. It would appear that the syncope and apocope which occurred in Celtic in the pre-written period must have followed lenition as the intervocalic environment for the latter must have been available. Consider the following forms.

(4)   Gaulish   Old Irish   Modern Irish
        nertomaros   *nertmar*   *neartmhar*   'strong'

The adjectival ending *-mhar* shows lenition which historically can only occur if the /m/ from which the /v/, nowadays written *mh*, derives was originally in intervocalic position, i.e. the lenition must have occurred before the preceding *-o-* was lost by syncope. Note that Irish has resisted the development of /z/ despite the many intervocalic occurrences of /s/.

Cluster simplification. This can be seen as part of the general tendency to reduce word forms phonetically, a tendency which can be taken to be connected with the strong initial stress accent which lead to a natural weakening of unstressed syllables.

(5)   Gaulish   Old Irish   Welsh
        uxellos (*x* = /ks/) *úasal*   *uchel* (*ch* = /x/)   'noble'
        vindos   *find*, later N+stop → NN, ModIrish: *fionn* 'fair'

2.2 Primitive Irish: Ogam

The Old Irish period is taken to have lasted from 700 to 900. This is a period of written remains. Primarily the Old Irish documents consist of glosses, those of the Epistles of Paul in the Codex Paulinus at Würzburg which date from the mid 8th century and those of Milan from the early 9th century (Thurneysen, 1946:4-11). Of the two collections the latter is not as reliable as the former. For lexicographic purposes the mid 9th century glosses from St.Gallen in Switzerland are of great value.

However before these documents there are attestations of what is called Primitive Irish in a non-Latin alphabet called Ogam which was chiefly used for inscriptions to be found in the south of Ireland and to a much lesser extent in the rest of the country and in Wales.[9] There are a few hundred of these inscriptions which date mainly from the 5th and 6th centuries AD. Between these and the Old Irish glosses there

is a gap of almost three centuries in which the language would appear to have changed quite radically at least going on the representation of it in Ogam and in the earliest written documents, granting that the Ogam inscriptions were in all probability in a codified literary norm used by a very small literate section of the community and removed from the spoken language of the time.

The primitive Irish of the Ogam inscriptions still shows full vowels without syncope.

(6) *senobena* → *senben* → *seanbhean* 'old woman'

  inigena → *ingen* → *iníon* 'daughter'

  maqqos → *maqq* → *mac* /kk/ → /k/ 'son'

An inscription like *Avii Corbbi* 'grandson of Corbos' contains *avios* 'grandson' (still preserved in the /oː/ before surnames in Irish, cf. š Múrchú) and also shows the initial *C* of the modified noun in intervocalic position. This lenites to /x/, the lenition here being characteristic to this day of the masculine genitive of nouns. The lack of apocope and syncope which has been noted for Gaulish is true for Ogam as well, cf. *Catubutas* /kaθuvudas/ 'of Chathub' → *Cathbad*.

1.3   Mutations in Old Irish

Before venturing further it would seem approriate to offer a tabular overview of the two main mutations of Old Irish as these will be used as reference points for later discussion. For the earliest stage of the language one has a system which was quite regular in its operation and well on the way to being the main means for realizing morphological distinctions in the nominal area. For verbs the complex system of prefixes and infixes was still productive and mutation played a secondary role being a low-level phonetic phenomenon determined by the type of sandhi which arose with the verbal clitics.

(7)   *Lenition*

  p → f   b → v
  t → θ   d → ð
  k → x   g → ɣ

  s → h   rr → r
  f → 0   ll → l
  m → mu   nn → n

By this stage of Irish palatalization and de-palatalization had become established as a means of nominal inflection on the right-hand margins of words. Thus the sound segment inventory has been divided in two with a whole series of non- palatal and palatal consonants (Thurneysen, 1946:96-109). The palatal # non- palatal dichotomy applied to all consonants except /h/.[10] The sound symbols in the above table should thus be understood as applying to both type of consonants. The same applies to the following table for the nasalization mutation.

(8)   *Nasalization*

p	→	b	→	m		f	→	v
t	→	d	→	n		V	→	n + V
k	→	g	→	ŋ				

The ontogenesis of the nasalization mutation poses a number of questions for the phonologist. As can be seen already from Old Irish the nasalization of voiceless stops produced voiced stops and not nasals as is the case when the input consisted of voiced stops. This would imply that nasalization consisted first of all of the transfer of the feature of voice to the initial segment of the host lexical stem and only if this were voiced could nasalization itself be transferred. Recall that the situation is different for Welsh which has voiceless nasals as the result of nasalizing voiceless stops. Irish thus contrasts with those languages which show pre- nasalization as an initial mutation. This is found in a sub-group of West Atlantic languages, chiefly Fula and Serer (Sapir, 1971:67; Ladefoged, 1964:46; Anderson, 1976; 1992:348f.). In these cases nasalization has not been broken up into voicing and nasalization proper, i.e. voiceless stops prenasalize to clusters of nasal and voiced stop. The development in Irish is different in principle from the many cases of pre-nasalization from Sub-Saharan languages discussed in Herbert (1986) as post-nasal voicing does not imply the presence of a nasal itself (Herbert, 1986:236f.). For Scottish Gaelic Sommerfelt (1962:366) and Oftedal (1956:166f.) have noted some cases of prenasalization of voiceless and voiced consonants. Here one would appear to be dealing with a timing phenomenon on a phonetic level. Both authors admit that the stop portion of clusters like /m^b/ is very short. Given the fact that Scottish Gaelic is historically a form of Northern Irish and given the tentative status of these post-nasal stops it would seem justified to regard them as later developments and not the original stops present before the rise of the nasalization mutation.

3   Evidence for lenition in Celtic

Terminology in Celtic linguistics. Windisch (1879:13,23) is among the first to use the term *Aspiration* (= 'aspiration') for lenition. This practice is carried on by later linguists, notably Pedersen (1897). The term *Eclipse* (= 'eclipsis') is used for nasalization. By 1913 Pedersen (427-476) and later in 1925 Pokorny had started to use the term *Lenition* (= 'lenition') (1925:11f.) while still retaining *Eclipse* for nasalization (1925:11-13). This would seem to go back to Thurneysen who in his *Handbuch des Altirischen* (1909) showed his preference for it.
        The dating of lenition has been a matter of controversy for as long as it has been a subject of investigation. With many authors one finds quite vague statements. Pokorny (1925:8) for instance is non-committal about the dating of lenition and simply states that it arose 'vorhistorisch' (= 'in the prehistoric period'). Others attempt to be more precise in this respect. Pedersen (1913:436) for example states that 400 AD is the latest possible date for lenition. However Pedersen sees evidence for lenition in Gaulish and indeed views the shift of IE *p to /f/ (and then to zero) as part of the original lenition process. This would place it in a period around 800 BC. From these dates one recognizes that one is dealing with a time span of over 1000 years in which this phenomenon is taken to have arisen. Furthermore there are narrow interpretations of lenition which refer to the differential weakening of consonants in certain environments and wider views which treat as lenition any weakening attested in Celtic. The broader interpretation has the advantage of linking up the loss of IE *p in Celtic (a common Celtic phenomenon, Evans,

1976:77) and is in accordance with the present-day lenition of /f/ in Irish, namely to zero. In this interpretation Modern Irish lenition would recover the second stage of the loss of IE *p*:

(9)   IE p   ->   f   ->   Ø
                             f (+ lenition)   ->   Ø

Martinet is a representative of the narrower view of lenition. He excludes the loss of *p* (1952:196) on the grounds that it occurred unconditionally.

Positing lenition at an early period helps to account for the appearence of mutations in all the Celtic languages as a common development and not a shared innovation. The latter view is difficult to sustain seeing how typologically unusual morphological mutation is and that it is present in all attested Celtic languages. The earliest remains, Gaulish for Continental Celtic and Ogam for Insular Celtic, would then be interpreted as having lenition but not showing it. The lack of syncope and apocope in these early attestations is inkeeping with the view that lenition must have preceded the loss of unstressed word-internal vowels and inflectional endings.

Gray (1944:229) assumes on his analysis of the linguistic evidence that there was lenition in Gaulish and stressed that it probably arose much earlier than it was recorded. He notes cautiously that the instances of lenition in Gaulish are word internal (1944:224). This is not disturbing as one would not expect for it to be indicated anyway, i.e. the four possible traces of internal mutation in Gaulish are probably slips on the part of those recording the language who usually adhered to the practice of not indicating the articulatory change.

The possible reasons for lenition occurring in Celtic are threefold according to Martinet (1952): (i) substratum influence on early Celtic; (ii) appearence in one dialect and spreading to others and (iii) its existence as a low-level phenomenon among all early varieties with later functionalization in all dialects. In fact of these three options none is an explanation, they are rather descriptions of possible situations in which lenition arose. The final reason why speakers weaken consonants in voiced environments (mainly intervocalically, word-finally or in sandhi contexts) would seem to lie in the preference for weak pronounciation variants in these environments in some speech community as a result of speaker attitudes, e.g. imitation of prestige varieties with such weakening.

The question of substratum. The chief difficulty with substratum accounts for language change is that they basically explain nothing. For lack of a convincing source for a change one refers to substratum without of course specifying why an adopted feature should have been present in the substratum to begin with. In the case of lenition in Celtic the substratum view is one which apparently offers an explanation for its genesis. With regard to Western Romance lenition, Celtic influence in its turn (Martinet, 1952:216f.) has been alluded to as a possible source of similar phenomena in the Romance dialects west of Italy. Ternes (1977) in his comprehensive study of both Celtic and West Romance sandhi phenomena refuses to be drawn on possible ontogenetic connections between the two (1977:51).

3.1   Lenition in loan-words

For the status of lenition in the sound system of Irish the treatment of loan-words is of importance. One can see with Latin borrowings in Old Irish that lenition always takes

place at the favoured phonetic sites, i.e. intervocalically or in the environment of voiced consonants.[11] This lenition in non-initial positions is carried to its natural conclusion in the further development of Irish loans as can be recognized from the following forms.

(10)	Latin		Old Irish		Modern Irish	
	liber	→	*leber*	→	*leabhar*	'book'
	opera	→	*opair*	→	*obair*	'work'
	sacerdos	→	*sacart*	→	*sagairt*	'priest'
	regula	→	*riagol*	→	*rial*	'rule'

Observe that the Latin loans have an intervocalic single consonant lenited from stop to fricative if the former is voiced. With geminates there is usually just a simplification without any further change in manner of articulation.

(11)	*peccatum*	→	*peccad* →	*peaca* 'sin'

This weakening is to be seen with later Scandianvian loans in intervocalic position.

(12)	*markaჳr*	→	*margadh*	'market'
	akkeri	→	*acaire*	'anchor'

With the Anglo-Norman loans which turn up in the language from the 12th century onwards lenition is also to be found, but not in all cases as it was losing its force as an automatic rule on borrowing.

(13)		*botel*	→	*buidéal*	'bottle'
		bacun	→	*bagún*	'bacon'
	but:	*super*	→	*suipéar*	'supper'

The loan-words which are attested with lenition in the history of Irish are inkeeping with the view that lenition involves a scale on which elements shift towards the ultimate goal of vocalization. One can see with the Latin loans that geminates simplify to stops while voiceless stops weaken to voiced ones and the latter fricativize and are vocalized later in Irish.

(14)	(i)	geminate stop →	simple stop	
	(ii)	voiceless stop →	voiced stop	
	(iii)	voiced stop →	voiced fricative	(→ vowel)

The lenition attested for the above loan-words is in one vital respect different from the lenited reflexes of voiceless stops from early Celtic: these stops become voiced in Latin and later loan-words while the simple voiceless stops of pre-Insular Celtic become voiceless fricatives in Irish, e.g. /t/ becomes /θ/ and not /d/ as in later stages of the language. In Welsh the position is different as these stops remain plosives but become voiced (like the later Irish loan-words). Indeed if one looks at lenition in a broader perspective and includes Romance dialects for instance then one finds repeatedly that the lenition cline forks at voiceless stops and takes one of two possible pathways: either

these segments fricativize directly and retain their voicelessness or they retain their occlusion and acquire voice.

4   The origin of mutation in Celtic

Any consideration of the origin of mutation must start with phenomena which are purely allophonic. On this level one attains the greatest degree of generality. So in various varieties of West Romance one has allophonic phenomena which could lead to mutation but have not arrived at that point and of course may not do so (Ternes, 1977:30-). At this point attention is to be paid to the origin of mutation with the Celtic sub-group of Indo-European.

For the earliest phase of Celtic one can assume that certain low-level phenomena were present in the language (Martinet, 1952:196). Take lenition as an example. This is a major mutation in the present-day Celtic languages which plays a central role in the grammar of each language. Its origin obviously lies in intervocalic voicing of voiceless segments. As such it is quite unspectacular. There are many languages (Danish or Spanish, for instance) or dialects (south-west dialects of German, various Italian dialects) in which voicing occurs allophonically in intervocalic contexts. This lenition was obviously part of the phonetic makeup of Insular Celtic indeed probably of Continental Celtic, although there is no direct, unassailable evidence.

Low-level phonetic lenition is a necessary precondition to the development of morphological lenition at a much later point. Note that the assumption is being made that it was a generalized feature of Celtic at this period much as other general features, such as shortness of vowels in most forms of Scottish and Northern Irish English, can be assumed to part of the makeup of a language or variety.

Given the stress-accent in Celtic the inherited inflectional endings became indistinct. Q-Celtic reacted to this situation by phonologizing the palatalization of inflection-initial stem consonants which occurred with those endings which had high vowels. This is the same type of functionalization which one has in West and North Germanic with umlaut which started as a phonetic correlate of inflections with high front vowels or /j/ and obtained a grammatical function once these endings were lost.

Together with the decline of inflections one has a phonetic levelling of elements in pre-nominal position, e.g. personal and possessive pronouns which lost much of their distinctiveness. This loss threatened to result in the syncretism of major grammatical categories.

What is interesting in Celtic is that the very process, phonetic weakening, which was gradually threatening the set of grammatical distinctions, itself provided the 'solution' to the dilemma which was arising. Conceive of the scenario as follows: as part of lenition one has external sandhi becoming ever more frequent. This led to lenition at the beginning of lexical stems along with a process of nasalization if a lexical stem was preceded by a particle which itself ended in a nasal. Lexical stems were beginning to be differentially effected by particles which preceded them depending on the phonetic shape of the end of the latter. The particles became blurred by phonetic reduction but they retained an effect on the beginning of following words as a result of external sandhi.

4.1   Relative chronology of mutation

The relative chronology of mutation in the Celtic languages poses a riddle for the

historical linguist much as does umlaut in Germanic. Recall that umlaut is a phenomenon which is present in West and North Germanic to vary extents (it is one of the major changes which sets these branches of Germanic off from Gothic). Yet umlaut, for Old English for example, must be placed in the pre-written period of Old English at the very earliest after the palatalization of velar stops (Lass, 1987:124). This shows that the phenomenon does not stem from a common stage but represents a case of a shared set of innovations in West and North Germanic. For the Celtic languages the mutations, which are characteristic of *all* languages for which documents exist, are shared innovations on a grammatical level as various early attestations of these languages show pre-mutation forms. What is probably the case is that the weakening of consonants and the presence of external sandhi was part of the phonetic makeup of the Celtic languages in their common stage but that this was only phonologized after their split.

Mutation, if it is to be utilized morphologically, must affect the onset of stressed syllables, i.e. in Celtic the beginnings of lexical stems. This is only possible if external sandhi phenomena develop in which alteration of the segmental composition of syllable onsets occurs. Furthermore there must be at least two alterations which are different in type. In sonority terms these may result in changes in one of two directions which can represent weakening or strengthening of a segment respectively.

(15) (i) Lenition[12]
(a)	Voicing	Irish, Welsh
(b)	Fricativization	Irish, Welsh
(c)	Degemination	Old Irish
(d)	Deletion	Irish /f/

      (ii) Fortition
(a)	Devoicing	Breton
(b)	Plosivization	Breton
(c)	Gemination	Old Irish
(d)	Nasalization	Irish, Welsh

Lenition can be interpreted as a general directive to weaken a segment. Its actual manifestation in a particular language will depend on the constellation of segments which that language shows. A comparison of Irish and Welsh illustrates this point quite clearly.

(16)
Common Celtic	Irish	Welsh
/p, t, k/	/f, θ, x/	/b, d, g/

The shift of the voiceless plosives must be seen in the context of the other obstruents in both languages. Martinet (1952:200), in the best structuralist tradition, sees the shifts of Common Celtic obstruents as a matrix in which lenition is sensitive to the arrangement of these segments in the sound system of each language.

(17)
Common Celtic		Irish	Welsh
/tt/	→	/t/	/t/
/t/	→	/θ/	/d/
/dd/	→	/d/	— (rare in Brythonic)
/d/	→	/ð/	/ð/

As word-internal voiced geminates were common in Irish (Kuryłowicz, 1971) due to the assimilation of sequences of stop and nasal[13] and as these simplified to single voiced stops (degemination as lenition with geminates, Feuth, 1983) the voiceless stops did not become voiced but fricativized.

Arrest of phonetic development. Once lenition is functionalized it does not continue phonetically. Thus /ɣ/ does not initially disappear as it does word- internally in Irish (though it has in Welsh). /s/ does not lenite beyond /h/ as opposed to Andalusian Spanish which has /s/ → /h/ → 0, e.g. *las casas*, [lah kasah], [la kasa]. /k/ does not assibilate to /ʃ/ via /tʃ/ as it has done in French, for instance.[14]

Developments in Breton. Breton is clearly the Celtic language with the most irregular phonology. To begin with the dialects vary greatly in both when mutation is triggered and what the manifestation of a particular mutation is.[15] There is a shift of /ð/ to /z/ in nearly all dialects with the partial exception of the Vannes country. Note that this dialect also has an occasional voicing of the voiceless fricatives which result from stops by the spirant mutation, e.g. original /p/ → /f/ becomes /p/ → /v/.

Breton of all the Celtic languages has a fortifying mutation 'provection'. It occurs chiefly after *ho* 'your'-PLURAL which originally had a voiceless velar fricative as word-final consonant, later a glottal fricative. This sound causes the following consonant, by assimilation, to become voiceless (Le Dû, 1986:449). This situation shows that the mutations are assimilation phenomena and not a general weakening rule for all the Celtic languages although the assimilation in environments of greater sonority follows general weakening principles.

Furthermore there also exists in Breton a so-called 'mixed mutation'. This is found at the beginning with verbs. By 'mixed' is meant that some segments are affected differently than others. This mutation consists of lenition and provection (Le Dû, 1986:442), e.g. /b/ becomes /f/ which consists of spirantization and devoicing at the same time: *oh vlejal* [fle:zəl] 'shouting' (from *blejal*, 'to shout'); /g/ becomes /h/ in *oh ouelo* [o hwelo] 'crying' (from *gouelo* [gwelo] 'to cry').

4.2   A case in point: the third person possessive pronouns

On the valid assumption that the mutations arose as sandhi phenomena one can look to reconstructed forms to determine what final consonants, if any, were to be found at the end of particles which later triggered mutation in the Celtic languages. The easiest case to examine in this connection is that of the third person possessive pronouns. It will be remembered that the possessive pronouns have their origin in the genitive of personal pronouns which was used for this purpose. For Indo-European the reconstructed forms are as follows (Szemerényi, 1989:219).

(18)   SG MASC   SG FEM   PLURAL
              esjo   *esjās*   *eisōm*

Reflexes of these can be seen for the singular in Sanskrit *asya*, *asyās* and in Greek in the non-reflexive personal pronouns. If one now considers Old Irish (Thurneysen, 1946:278) then one sees that already for the oldest stage of the language these forms had all been reduced to a single sound *a* /a/.

From the point of view of typological change what is interesting is how the Celtic languages would seem to have reacted to the phonetic attrition which affected such forms. That there was system pressure after the loss of distinctiveness to find an alternative means of indicating the gender and number categories can be assumed without doubt. Recall that in late Old English the partial homophony of the forms of the third person personal pronouns, *he, heo, hi* (Strang, 1970:263-267), was remedied by the rise of a feminine form with an initial /ʃ-/ *she* and by the borrowing of ultimately Scandinavian forms in the north of England with an initial /θ-/, e.g. *they, their*.

Now within the inherited framework of Indo-European morphology, the third person showed three distinctions, two in the singular between masculine and feminine and a plural form different from both of these. Given the pre-Old Irish reduction of *esjo, esjās, eisōm* to *a* whatever alternative means of category distinction in this area of the language's morphology was to be employed, it would have to involve a tripartite distinction.

The sandhi phenomena provided just such a means to retain distinctions by transferring them from the form of the possessive pronoun itself to the effect it had on the following word. Consider the types of sandhi found with the third person possessive pronouns in Irish.

(19) a   Masculine: Lenition
      b   Feminine: Gemination[16]
      c   Plural: Nasalization

The situation in Welsh is somewhat more complicated. In Middle Welsh one has a group of stressed possessive pronouns with fuller forms, masc. *eidaw*, fem. *eidi* and pl. *eidunt* (Evans, 1976:54) which result in Modern Welsh *eiddo, eiddi, eiddynt* respectively. However the corresponding forms to the Irish ones are the so-called dependent pronominal forms (Williams, 1980:48) which show two forms: masc. and fem. *ei* and pl. *eu* in the modern language. When used as a masculine form *ei* causes the voicing ('soft') mutation and when it occurs as a feminine form it evokes the fricativizing mutation ('aspiration'). The plural form *eu* causes no mutation with a consonant-initial word but prefixes *h* to a vowel at the beginning of a word.

(20)   Welsh *tad* /taːd/ 'father'

              ei dad /i daːd/ 'his father'   Soft Mutation
              ei thad /i θaːd/ 'her father'   Spirant Mutation
              eu tad /i taːd/ 'their father'   Zero Mutation

The differences in mutations between the various Celtic languages is largely due to the manner in which the original sandhi was manifested. Thus in Irish the final /-s/ of the feminine third person possessive pronoun, 'her', led to gemination but in Welsh and in Breton (Jackson, 1967:319f.) led to spirantization, i.e. in Irish the length of the /-s/ was transferred to the initial segment of the following word, yielding a geminate, while in Brythonic (Welsh and Breton) the fricative character of the /-s/ was carried over to the next segment in sandhi with it, fricativizing it.

With Brythonic *eson* 'their' (from IE *eisōm*) the continuant character of the final nasal causes fricativization of the next segment in Breton, hence the spirant mutation after *o* 'their'. In Welsh no mutation followed except for prefix-*h* with vowel-initial forms

(Jackson, 1967:320). In this respect Irish represents the language with the purest form of sandhi with nasals as these cause nasal mutation.

(21) Breton *ti* /tiː/ 'house'

e di	/e diː/	'his house'	Lenition
he di	/e ziː/	'her house'	Spirantization
e zi	/o ziː/	'their house'	Spirantization

Breton has *e* 'his' with soft-mutation; *e* 'her' has spirant-mutation. Recall that in Irish lenition is always spirantization (or glottalization or deletion if the input to the mutation is an independent fricative). The soft-mutation of Welsh and Breton as a phonetic process is part of the morphological mutation nasalization in Irish, i.e. voiceless stops 'nasalize' to voiced stops: /p, t, k/ → /b, d, g/. This step in Welsh is realized by voiceless nasals: /p, t, k/ → /m̥, n̥, ŋ̊/.

  In Breton there is a further mutation called 'provection' which is a kind of phonological strengthening, e.g. it converts voiced stops into voiceless ones.[17] It is not realized with voiceless segments as these are voiceless anyway. This restricted applicability of provection may be a reason for its relative rarity in Celtic. It occur after *ho* 'your'-PLURAL in Breton and is historically traceable to a preceding voiceless segment in sandhi relationship with a following lexical word.

  It is important to stress that the type of mutation found at a paradigm point has nothing to do with the nature of the grammatical category but simply with the type of phonetic ending in the preceding particle in any word group involved in sandhi. Three types of sandhi are attested for Old Irish.

(22) a -V#____ Lenition (V = vowel)
   b -O#____ Gemination (O = obstruent)
   c -N#____ Nasalization (N = nasal)

Now consider the repair a language has to engage in if its inflectional endings are becoming increasingly blurred. It can change to a more synthetic type and use relational particles like prepositions and render the word-order less flexible. This has been the English solution within the context of Germanic. For the Celtic languages the solution has been to retain a largely inflectional type but to change this to a kind of stem inflection in which the beginnings of lexical stems carry grammatical information by allowing variation in phonetic form.

Sandhi and cliticization. The external sandhi which resulted in the Celtic mutations implies a removal of lexical status from the mutating particle and the docking of this to the noun which serves as host. The particle loses stress and phonetic distinctiveness. One should expect movement on the following morphologization cline (Hopper and Traugott, 1993:132).

(23)   lexical item > clitic > affix

But while the mutating particles in Celtic share many of the characteristics of cliticism (low phonetic profile, for instance) they do not undergo affixation. If they were absorbed by the host this would lead to severe loss of grammatical function unless some other method was available in the language in question to take over this function. The mutations

of Celtic were not a response to lexical stems slipping downwards on the morphologization cline but to the loss of phonetic distinctiveness. Put in other terms, affixation of clitics would seem to be dependent on the functional status of the latter. If they are central to the morphology of a language then affixation is rendered unlikely. This view would seem to be corroborated by the verbal clitics of Old Irish which do indeed affix to the verbal host they were associated with (as Hopper and Traugott, 1993:165 point out). The result is morphologically a loss of certain verbal particles (not central to the language) and phonologically an increase in the substance of verb stems (Hopper's 'phonogenesis', *loc.cit.*).

4.3 Minimum number of distinctions

In order for low-level phonetic phenomena like those in early Celtic to be promoted to system status there must be at least a tripartite arrangement of distinctions. Given say initial voicing with lexical stems due to external sandhi one then has a bipartite distinction between voiceless and voiced segment in a word- initial position. The third distinction can be arrived at in a number of ways. A common means is for the initial segment of a lexical stem to be geminated under specific circumstances. This is the situation which one has in Tuscan Italian with the *gorgia toscana*, which is the fricativization of stops, and the more general central and southern Italian *raddoppiamento sintattico* which leads to the gemination of stops in initial position. Historically these occur with such preceding particles as ended in a consonant in Latin and whose length finds a reflex in the intial gemination of the first segment of the following word, e.g. *a* 'to' < Latin *ad*.

(24)   a   *di casa*   [di hasa]   'from home'
         b   *per casa*   [per kasa]   'for home'
         c   *a casa*   [a kkasa]   'to home'
                                            (Lepschy and Lepschy, 1986:77)

In Tuscan Italian these initial changes have not been functionalized. They are allophonic just as umlaut was before the loss of the endings which provoked it. As long as the preprepositions which cause *gorgia* and the *raddoppiamento sintattico* are phonetically distinguishable the load, from a morphological point of view, cannot be said to be carried by these sandhi phenomena.

       In pre-Old Irish, that is in the formative period for the grammatical mutations, the three distinctions present in Tuscan Italian were also available (though gemination is no longer to be found in Modern Irish). A further distinction was available in Insular Celtic, namely that of nasalizing a word-initial segment (if voiced) or voicing it (if voiceless). Other phonetic changes, particularly in secondary articulation, are conceivable, such as palatalization/velarization, labialization, aspiration, etc. In the case of Nivkh (Jakobson, 1971) ejection is used as a variant in initial mutation.

       A further option consists of strengthening a weak segment. This can mean plosivizing a fricative or unvoicing a voiced consonant. Note this fortition, which is traditionally termed 'provection' (Hemon, 1975:11f.) and which occurs in Breton, must be distinguished from the lack of a change, i.e. zero mutation.

4.4   Regularity and scope of mutation

For the promotion of mutation to the grammatical level of a language it must evince a high degree of regularity otherwise a typological shift is unlikely to get under way in a language. This is seen clearly in Old Irish in which lenition is just a change in manner of articulation but not of place. Furthermore a mutation must in principle be applicable to any segment in the language. Again in Old Irish the contrast of geminate and simple consonants offered an axis on which contrast could be achieved with any consonantal segment in the language except /h/.

Once mutation has been promoted in a language it obtains a certain degree of stability due to its functionalization. In Old Irish the phonetic process of lenition was more or less frozen in initial position although it continued in word-medial and word-final position to its natural conclusion, i.e. it led to the vocalization of voiced fricatives.

4.4.1   Disruption of the system

Of course it is not true to maintain that change does not exist in a language once phonetic phenomena are promoted to system status. There is often a degree of tension between phonetic shifts and the exigencies of the language's grammar. Thus in Irish the system has survived a considerable degree of disruption which resulted from two major sound changes: (i) the simplification of geminates and (ii) the loss of ambi-dental fricatives /θ/ and /ð/ in the Middle Irish period. The fricatives were compensated for by a shift in place of articulation on lenition so that an earlier change of /t/ → /θ/ was rearranged as /t/ → /h/ and /d/ → /ð/ was rerouted to /d/ → /ɣ/. This led to some homophony but the results were acceptable given contextualization in language use. The loss of geminates was in part compensated for by shifting the distinctions in length to ones in secondary articulation, i.e. by realigning the axis for contrast in the language's phonology (see section 3.8.1 *Realignment of oppositions* below).

4.5   Overlap and zero in mutation

Two further aspects of mutation might seem to militate against its functionalization in a language. The first of these is overlap. Consider the following examples from Modern Irish.

(25)	a	*a phian*	/ə fiən/	'his pain'
		a fíon	/ə fiən/	'her wine'
	b	*a dhaol*	/ə ɣiːl/	'his beetle'
		a ghaol	/ə ɣiːl/	'his relationship'

In (25a) the result of leniting /p/ is the same as the independent /f/ which is unchanged after the feminine form of the third person possessive pronoun. With (25b) one has the same phonetic shape for two words which have different unmutated forms. This results from the fact that both /d/ and /g/ yield /ɣ/ on lenition. These homophonous forms occur within the same word class but as speakers always know the unmutated form of the

lexical stem and given sufficient contextualization the homophony does not disrupt the functioning of the language.

Equally a language with mutation can accomodate an alteration between a segment and zero. In Irish this is and always has been the case with /f/ which lenites to zero.

(26)   *a fhíon* /ə iən/ 'his wine'

This alternation is consistent with both the principle of lenition and the phonological structure of Irish. Given that stops lenite to fricatives then the latter if they lenite must either change their place of articulation and realize lenition as as a different fricative or they must lenite to zero. Both options can be observed in Irish: /s/ lenites to /h/ but as the language has no further independent fricative, /f/ lenites to zero. Note that an independent, non-mutated segment does not result in a segment which is itself the result of a mutation operating. This blocks a shift like /f/ → /x/ in principle as the velar fricative does not occur initially in lexical stems, i.e. it only appears in this position as the result of leniting /k/.

4.6   Effectiveness and mutation systems

If one views the Celtic languages as instances where phonetic mutation has been raised to a morphological level then one can note certain characteristics of the systems they embody and tentatively conclude that these have general validity for languages which might functionalize such phonetic phenomena. Considering the Celtic mutations from the point of view of their effectiveness one notes that they involve minimal phonological alterations within the relevant languages.

Feature change. By 'phonologically minimal' is meant here that only one significant feature of a segment is altered for a mutation. For instance the change from voiceless stop to voiced one or of voiced stop to voiced fricative are single- step changes, in feature terms from [-voice] to [+voice]. The shift from voiceless stop to voiced fricative as in the northern Sardinian dialects of Logudoro (Lüdtke, 1953:412) involve two steps, i.e. [-voice, -continuant] changes to [+voice, +continuant]. For a language which functionalizes mutation single-step alterations are preferred as this leads to a system which is economic in its feature changes. The more economy there is, the more distinctions can be encoded using mutations, the more effective the resulting system is for the morphology of the language concerned. This can be seen quite clearly by comparing Welsh with the Sardinian dialects just mentioned. The latter collapse voicing and fricativization into a two- step change whereas the former has these as separate processes which have become historically the *soft mutation* (i.e. voicing) and the *spirant mutation* (i.e. fricativization) allowing a greater number of grammatical categories to be realized than a system with two-step changes like Sardinian.

Phonetic exponence. For a language which has functionalized mutation the manifestations of a mutation may subdivide into different kinds of phonetic alteration. For instance in Old Irish the mutation lenition had at least two exponents (see 3.8.1 *Realignment of oppositions* below for a further option which arose after Old Irish); nasalization also has two exponents.

(27)   Old Irish lenition   ->   (a)   Degemination
                                          (b)   Fricativization

        Irish nasalization   ->   (a)   Voicing
                                          (b)   Nasalization

The notion of zero mutation. For any language with a system of mutation there is an implicit contrast between a mutated form and a non-mutated form. The lack of a mutation may not only be characteristic of citation forms of lexical stems but also of an inflectional category. Thus in Modern Irish the genitive singular of nouns normally shows lenition, but with feminine nouns there is no mutation. In such instances one can speak of a zero mutation which is typical of this category.

Absence of double mutation. In the Celtic languages there is an absolute prohibition on applying more than one mutation to a single segment. Synchronically there is a simple explanation for this: the mutations are associated with mutually exclusive grammatical categories. From a diachronic standpoint double mutation could well have developed but would have obscured the steps of the individual mutations. Here one can see that mutation is a form of inflection which resists multiple application and is in contrast to agglutination which favours concatenation of many morphemes.

Functional load of mutation system. The main function of the mutational system in Irish lies in the nominal area. With verbs the three tenses and moods are indicated by inflectional means though in some cases syncretism has arisen due to the phonetic indistinctiveness of these endings. In such instances mutation, in this case lenition, can become the sole distinguishing factor between two verbal categories (see section 5 *Analytical trends in Irish* below).

  The core distinctions in the nominal area are those of case and number. The latter is indicated by palatalization or by an inflection. The set of inflectional endings is becoming increasingly regularized reducing the allomorphy of the plural (Hickey, 1985).

  There are three cases in Modern Irish which show mutation. The main distinction is between the nominative and genitive. The vocative is functionally peripheral in the language, used only in address or for such pragmatic functions as attracting a speaker's attention. It is formed with the particle *a* /ə/ which takes lenition: *a Sheáin* [ə ça:nʲ] 'John!'. The separate accusative and dative forms of the older language have long lost their phonetic distinctiveness and the categories have been abandoned as can be seen from the syncretism with the following forms.

(28)   NOMINATIVE   *céle*   'fellow'
                GENITIVE   *céli*
                DATIVE   *céliu*

All of these become *céle/céli* (Lewis/Pedersen, 1937:73) where the final *e/i* is taken to indicate /ə/ after a palatal consonant.

  The loss of accusative and dative left just the nominative and genitive (the ablative, locative and instrumental of Indo-European are not attested in Celtic). The mutations associated with them depend on the gender of the noun in question. In Modern Irish there is a mirror-image relationship of the mutation required with each of these cases for the two genders.

(29)	Zero mutation	MASC NOM	FEM GEN
	Lenition	FEM NOM	MASC GEN

For the plural there are no distinctions of gender so that the nasalization which is characteristic of the genitive plural applies to both genders and in the nominative both have zero mutation.

4.7   Analogical spread and regularity

It is a commonplace that a phonetic phenomenon which is functionalized tends to spread to instances within a paradigm or lexical category to which it did not apply before. A commonly cited example of this is umlaut in German which originally affected nouns with *r*-plurals so that pairs like *Buch : Bücher* 'book' : 'books' are genuine umlaut plurals. Nouns which formed their plurals in -*a* did not have umlaut to begin with (no phonetic motivation as the inflection contained a low vowel) so that instances like *Baum : Bäume* 'tree' : 'trees' are cases of analogical spread of umlaut as a plural formation device (Lockwood, 1965:95).

The mutational system in the Celtic language has experienced the same type of analogical spread to achieve paradigm regularity (Thurneysen, 1946:149). A good examples of this is provided by Latin loan-words. Recall that IE **p* was lost in Celtic so that Irish has no inherited lexical stems with an initial /p-/. However with the Christianization of the country many Latin loans entered the language, some of which had an initial /p-/. For these the shift of /p/ to /f/ on lenition was introduced on the analogy of the fricativization of other voiceless stops on lenition, *peccad* 'sin' (< Latin *peccatum*), *do pheccad* /do ɸekkað/ 'your sin' (*do* 'your' takes lenition).

The second kind of analogical levelling which occurred in Irish concerned not the introduction of a new lenition type (/p/ → /f/) but to the regularization of the output with a given input. Normally /s/ was lenited to /h/. There existed, however, instances of /s/ which went back to one of two clusters, either **sw* or **sp* (Thurneysen, 1946:117). Both the /p/ and the /w/ after /s/ disappear (compare Old Irish *siur* 'sister', lenited as *fiur*, with Old English *sweoster* or German *Schwester*). The remaining /s/ lenited, however, to /f/ in accordance with the lost labial segment and not to /h/ (Thurneysen, 1946:84). Now there are two possible situations which may have obtained in Old Irish. The first is that there was a phonetic difference between a normal /s/ and one derived from a cluster **sw* or **sp* (perhaps a difference in rounding for the latter). The second situation is that both kinds of /s/ were phonetically identical but that speakers stored the lenited form of lexical stems as exceptions in words which had an initial **sw* or **sp*. If this were the case then the later levelling of lenition for all types of /s/ to /h/ had the advantage that there was no need to store lenited forms of stems as exceptions.

4.8   Lenition of sonorants

At the outset of this section it is necessary to state that the concern here is with coronal sonorants, i.e. those produced in the dental-alveolar-palatal area. This deliberately excludes the labial nasal /m/ which can lenite normally in Irish to /v/ and the velar nasal /ŋ/ which only occurs as the product of nasalizing /g/. As the result of a mutation can never be the input to a further mutation (synchronically speaking), the velar nasal need not be considered here.

4.8.1   Realignment of oppositions

The first remark to make on the coronal sonorants *n,l,r* is that they have no obvious fricative equivalents unlike /p,t,k/ which have the continuant forms /f,θ,x/. From the point of view of the system of a Celtic language the question which arises is whether lenition can apply to coronal sonorants and if so what phonetic exponents were and possibly are used. Consider the following three options.

(30)   a)   devoicing of sonorants (Welsh)
        b)   geminate simplification (up to Old Irish)
        c)   depolarization (as of Middle Irish)

The situation in Welsh is the easiest as it is the most regular. A feature of Welsh is that the opposition voiceless # voiced applies to all obstruents and sonorants (as opposed to Irish which just has the opposition for obstruents).[18] Lenition of sonorants is simple devoicing so that Welsh has two sonorant series, i.e. /m, n, ŋ, l, r/ and /m̥, n̥, ŋ̊, l̥, r̥/.

The second option of degemination is one which held for Old Irish, i.e. as long as the language had a general distinction of length among consonants. However, phonological length was lost in the Middle Irish period. This like the loss of inter- dental fricatives led to a disruption of the mutational system as lenition with sonorants was threatened with the loss of phonetic exponence. Now consider for a moment how geminates were articulated. By the Old Irish period all geminate sonorants in the language were either palatal or non-palatal. It is safe to assume that the latter were phonetically velarized as their reflexes are today and because, viewed typologically, a language with a palatal # non-palatal opposition tends to velarize the non-palatals to increase their articulatory distinctiveness. This applies for instance to Russian (Jones and Ward, 1969: 133ff.). The reverse is found in Persian (Bhat, 1978: 77) where the velars /k, g/ were palatalized after the rise of pharyngealization. The reactive polarization (velarization) of non-palatal segments in Irish can be connected up with the establishment of palatalization as a grammatical device in the language, i.e. one had originally [n] (before palatalization), then [n] : [nʲ], later /n/ : /nʲ/, phonetically [n̴] : [nʲ]. The velarization of sonorants is particularly audible (given their sonority) but is equally present with obstruents, e.g. [ṭ] : [tʲ], [ṣ] : [sʲ].

With the loss of phonological length the articulatory polarization on a palatal-velar axis acquired a new status in the language. From this point onwards lenition achieved a new manifestation in the reduction of an extreme articulation on this palatal-velar axis. If one uses the term 'polarization' to refer to either articulatory extreme on the axis in question then 'depolarization' can be taken to refer to a movement away from either extreme to a midway neutral articulation. To give a concrete example one had both [nʲ] and [n̴] as polarized articulations in a palatal and velar direction respectively. A depolarized articulation is represented by a neutral, alveolar [n].

(31)   velar   alveolar   palatal
            ɫ   →   l   ←   lʲ
            n̴   →   n   ←   nʲ
            ɼ   →   r   ←   rʲ

To talk of a palatal-velar axis is not the most accurate way of describing the articulatory gestures with these sonorants. It is true that the back of the tongue is raised for velarized sonorants as in [ɫ] but it is the configuration of the body and front of the tongue which is of greatest relevance in the system of oppositions which obtain in Irish. For this reason I propose a new articulatory description which characterizes the shape of the body of the tongue during sonorant articulation. The tongue can either be arched upwards for palatal or downwards for velarized sonorants. If there is no salient arching of the tongue the configuration is regarded as neutral (approximately that which one has for a so-called 'alveolar' lateral as in Received Pronunciation in syllable-initial position).

(32)   *Relative tongue configuration*
            convex   -   neutral   -   concave
            (palatal   -   alveolar   -   velar)

Relative tongue position is a classification of sonorants according to secondary articulation. The primary articulation is always apical (or possibly laminal) with lateral release for *l*-sounds and nasal release for *n*-sounds. For convex tongue configuration the primary closure is between the apex and immediately behind the lower teeth and for concave tongue configuration the primary closure is between the apex and immediately behind the upper teeth.

The decline of phonological length in effect meant that the opposition long # short for Old Irish was realigned as polarized # non-polarized as of Middle Irish. This was possible as the former geminate sonorants had a secondary articulation which tended to one extreme on a palatal-velar axis. The non-geminate sonorants were not affected, these retaining to this day their neutral, alveolar articulation.[19]

(33)   *baile* [-l-] 'town'   :   *buille* [-lʲ-] 'mad'
            duine [-n-] 'people'   :   *bainne* [-nʲ-] 'milk'

There are parallels to this situation in other languages which have undergone changes with former geminates. An example which Martinet has cited (1952:204) is the development of Latin geminate sonorants to palatals in the development of West Romance languages, Spanish *caña* < Latin *canna* 'reed' with single consonants having identical reflexes: *luna* < l*a̠ina* 'moon'. According to Martinet it is the longer duration and 'superior energy' which is 'transmuted' into a 'wider application of the front of the tongue' (*loc.cit.*), i.e. which results in palatalization.

This view would seem to harbour the clue to the switch from length to polarization with sonorants in Irish. Consider that sonorants with extreme tongue configuration (concave or convex) require more time for such a position to be adopted than neutral alveolar consonants do. As long as a language has phonological length distinctions elsewhere, for obstruents for instance, this length can be interpreted systematically. By these means one can account for the double spellings of polarized sonorants found in Old Irish (Thurneysen, 1946: 85f.). With the general demise of distinctive length in Irish, polarization is promoted within the phonological system as length is no longer the distinguishing characteristic of certain types of sonorants.

One should stress the very general nature of polarization. It applies as mentioned above first and foremost to former geminates but also to clusters of sonorant and obstruent and to those sonorants which stood in the onset of stressed syllables. This last environment is revealing as it is one of phonological strength. The polarized segments are traditionally referred to as 'tense', a feature which is without a direct phonetic

interpretation but which covers the polarization being discussed here and correlates on a phonological level with the notion of 'strength'. Recall that lenition is a general directive to weaken a segment. In view of the phonological strength of polarized articulations, depolarization can be seen as obvious weakening and thus represent a phonetic exponent of morphological lenition.

Polarization with r   With *r* there is least tendency for a tripartite realization [ɹ, r, rʲ]. This is usually a two-segment arrangement [ɹ, rʲ]. In addition, depolarization as an exponent of lenition has long being on the wane and scholars are uncertain as to whether it exists in any of the dialects today (Ó Cuív, 1986:398).

Traditional treatments of sonorants. The difficulty for linguistic discussion is that there is a tradition in Irish linguistics of not transcribing velarization for obstruents and in the case of sonorants to use capital letters for polarized forms, e.g. L (= ɫ), L' (= lʲ); N (= ṉ), N' (= nʲ). In such transcription systems lowercase letters denote depolarized or non-polarized articulations.[20] In fact what results is a putative fourway distinction for the sonorants *l* and *n*. Consider the examples given by Ó Baoill (1979: 90) for Donegal Irish (I have adapted his transcription and not indicated consonant length).

(34)	*mionna*	/mʲʌṉə/	/-N-/	'oath'	
	miona	/mʲʌnə/	/-n-/	'minor'-PLURAL	
	i mbinn	/ɪ mʲinʲ/	/-N'-/	[ɪ minʲ]	'in,on a cliff'
	i min	/ɪ mʲin/	/-n'-/	[ɪ min]	'in meal'

The phonetic transcription is intended to illustrate the lack of palatalization in the form *i min*; the word *miona* does not show palatalization either. Now there is no possibility of contrast between the two type of nasals in any context. What one has here is a neutralization (depolarization) of the contrast palatal ≠ velarized for nasals which derive historically from single consonants. The transcription which uses the apostrophe and the distinction between lower- and uppercase lettering is just paper phonetics derived from the orthography, ultimately of Old Irish. Wagner (1959:20) actually says this without touching on the whole complex of distribution, contrast and functional load of these segments in the present-day form of the language he is investigating (also Donegal Irish).

　　　　Accurate phonetic descriptions of the different sonorants are rare and, if offered, are to found in works by non-Irish linguists who would appear to be more firmly rooted in a strictly linguistic tradition with a strong phonetic component. This applies to both older authors like Pedersen (1897:47-62) and more recent ones like Oftedal (1986:9f.). Irish authors, even the most recent ones like Ó Siadhail (1989), offer little beyond making a vague reference to the 'tenseness' of the sonorants which they transcribe as L, N, etc. This has led to the kind of paper phonetics in Irish which has hindered the discussion of the status of sonorants in the relevant literature.

Tripartite divisions among sonorants in other languages. Petrovici (1959:185) remarks that three-way distinctions in Slavic were of short duration but that for Romanian these have existed for a long time.[21] The segments he recognizes are: palatal, palatalised and non-palatalised. A number of questions arise in this connection: are non-palatals phonetically velarized (this would increase their acoustic separation from neutral or palatal segments). By velarized one means a pronunciation, with liquids, like [ɫ] in

Received Pronunciation syllable-finally, or in Cologne German or of the non-palatal /l/ in Russian. Is the palatalised segment really neutral, an alveolar segment as in Irish *baile* [baːlə] 'town', is there an articulatorily satisfactory definition of what constitutes a palatalised segment vis à vis a palatal one? Furthermore, what is the functional load of the distinction palatalised # palatal? The answers to these questions are not forthcoming in the short article by Petrovici and there are few if any reliable references in the relevant literature on such tripartite distinctions among sonorants. Given this dearth of information one must forego any discussion of languages with similar distinctions.

4.8.2   Tenseness, gemination and lenition seen historically

From an historical point of view the origin of geminates in the older stages of the attested languages present difficulties in interpretation. To begin with one must consider Common Celtic at the time before the mutations had developed into the type of alternations which one knows from later history. The problem is that it is assumed that the initial consonants of lexical stems were in some phonetically unspecified sense 'tense' and so distinct from medial consonants which were then later lenited. If one assumes that tenseness was phonetically gemination then one is postulating that geminates occurred stem-initially in the pre-lenition phase.

Such consonants occur according to Lewis/Pedersen (1961:48f.) in the following instances.

1)   In absolute initial position, i.e. in the onset of stressed syllables without lenition *lá* /ɫɑː/ 'day', also after /s/: *slua* /sɫuə/ 'crowd'.

2)   In gemination which occurred frequently through cluster simplification in final position: *cland → clann* 'children'.

3)   In clusters with dental obstruents e.g. /dl/ in *codladh* 'sleep' (later simplified: Modern Irish /kʌɫə/).

Here two types of segments are confused. The latter type in (2) and (3) are geminates in the true sense as they arise from the assimilation of a stop by a sonorant and the absorption of its length yielding a phonologically long segment. The first type is treated as a geminate not because of any assimilatory phenomena but because it does not lenite like medial non-geminate segments.

However there is a general flaw in the above argumentation, namely the view that in the pre-lenition period there *must* have been an articulatory distinction between initials and medials *as if* this distinction was then to account for lenition of medials by a shift from tense to non-tense for stem-initials leaving medial consonants lenited, assuming that the difference in phonological strength between the two classes of segments was maintained. But it is the position of the medials which weakened them and not necessarily their intrinsic contrast with initial consonants, so that one can postulate that non-tense, i.e. non-geminate consonants, occurred initially but that these did not weaken, i.e. become lenited, because the syllable position of onset is inherently one of phonological strength. This view is supported by typological comparison with similar phenomena in other languages. Take a simple example of lenition of *t* in varieties of English (Harris, 1990). In many varieties of American English /t/ lenites to a flap [ɾ]

intervocalically. A weakening of /t/ to a glottal stop [ʔ] is to be found in Cockney English and many other urban varieties in Britain. In Southern Irish English /t/ is realised intervocalically as an apico-alveolar fricative [t̪]. In all these cases the lenition of /t/ does not occur word initially in the onset of a stressed syllable. It is the syllable position which is sufficient to account for the lack of lenition. By no means is it necessary to assume a former geminate /tt/ for stressed syllable onsets and a simple /t/ medially to then account for the differential behaviour of /t/ initially and medially in the present-day varieties with lenition.

There is a further weakness in the traditional view that stem-initial consonants were geminates. If one considers the distribution of geminates in attested languages whose structures are well-known then one generalization would seem to be valid, namely that the preferential position for geminates is the medial position after a stressed vowel.[22] The next position is word-finally after short vowels and the last one is word-initially. In the case of Swedish, which has a complementary distribution of long vowel plus short consonant and short vowel plus long consonant in the nucleus and coda of stressed syllables, geminates do not occur word-initially at all. If one now interprets the 'tense' consonants of pre-lenition Celtic as geminates the distribution one arrives at is one in which geminates only occur word-initially. This is clearly unacceptable on typological grounds. The entire problem dissolves if one no longer assumes that there must have been a quantitative difference between initials and medials to account for the later distinction between non-lenited and lenited segments in word-initial and word-medial position.

The medial geminates which are known to have existed in Celtic arose in many cases because of assimilation of one element in a cluster to another.[23] The geminates in forms such as *kattos* 'cat' in intervocalic position remain in the pre-lenition period and then simplify with the development of fricatives for simple stops in this position (Greene, 1966:116).

(35)   Lenition   CC   >   C;   C   >   F
        Proto-Celtic   Irish
        *kattos   cat   'cat'
        *katus   cath   'battle'
        *tōtā   túath /tuːəθ/   'people'
        *abbero   Welsh aber   'confluence'

This leads to an equivalence of geminate with later unlenited consonant and single consonant with lenited one (Greene, 1973:129). This can be seen quite clearly in the treatment of Latin loan-words which also demonstrate this equivalence Harvey (1984:94).

If one does allow for a stronger articulation in initial vis à vis medial position in the pre-lenition stage then one is talking of an allophonic difference (a view supported by Greene) which, if present, was simply a correlate of position relevant to stressed syllable.[24] To say that this articulatory strength blocked lenition is to put the cart before the horse so to speak. The strength is a result of the initial position of the stop and the medial position is what leads to a further reduction in firmness of the stops yielding a fricative which later attains phonemic status.

Greene following Sommerfelt (1954:116f.) denies that there could have been a threefold systematic distinction among stops of the kind geminate : 'tense' stop : simple stop (in their notation KK : K : k where capitalization in intended to imply

'tenseness').[25] Threefold distinctions did in fact later arise for sonorants (see 3.5 *Lenition of sonorants* above) but they were defined not on a length axis but but on one of relative palatality, i.e. by exploiting the distinction between palatal - neutral - velarized.

The status of loan-words in this discussion needs to be mentioned here. Sommerfelt (1962:326) has pointed out that Norse loans in Irish tend to have voiceless stops replaced by voiced ones and quotes uncontroversial loans like Old Norse *brók* > Irish *bróg* 'shoe'. Sommerfelt's argumentation is that the Norse voiceless stops were perceived to be as weak as the Irish voiced stops and uses this to strengthen his claim that the Irish voiceless stops were tense and fortis, more so than in other languages. However, it may simply have been that the Norse stops were not perceived as voiced but that they were subject to the productive process of post-vocalic lenition on or after borrowing. This account is inkeeping with the application of other mandatory operations on loans such as the obligatory metathesis which affected all words with voiced affricates which were borrowed from Anglo-Norman into late Middle Irish (Risk 1971, 1974): *page* > *páiste* 'child', *orange* > *oráiste* 'orange'.

5   Extensions after functionalization

With the establishment of mutation as the main inflectional device in the nominal area in Irish certain extensions arose which helped supplement paradigms at those points where mutation was not to be found. The lack of mutation had two basic reasons. Either no mutation applied because there was no historical justification for it and no analogical spread had occurred into a particular point in a paradigm or mutation did apply but the particular noun present on a certain occasion contained an initial segment which was immutable. These two situations provoked two different responses. The first was the morphologization of the lack of mutation. Thus zero mutation has become in the course of the history of Irish a signal for the genitive singular of feminine nouns and for the nominative of masculine nouns. The second response was the introduction of new devices which played the same role as mutation. Examples of these are the prefixed segments *t,h* and *n*. The instances discussed below all refer to Modern Irish which is used for purposes of illustration. Similar phenomena are found in present-day Welsh and Breton.

Prefix-t. By this term is meant the prefixation of /t/ to vowel-initial stems in certain contexts. From the point of view of the present-day language it is interesting to examine the distribution of Prefix-*t*. Bear in mind to start with that lenition cannot be shown before vowels so that any grammatical category which relies on lenition to be indicated will not be seen with vowel-initial stems.

Prefix-*t* occurs with masculine nouns in the nominative case. This is not a leniting environment but the /t/ helps to distinguish gender as it is not present with feminine nouns in the same case. With consonantal-initial stems the distinction between the two genders is realized by zero mutation in the masculine and lenition in the feminine.[26]

(36)	a.	MASC	*an ceann*	'the head'
			an t-arán	'the bread'
	b.	FEM	*an bháisteach*	'the rain'
			an áit	'the place'

Use of hiatus h. There is no phonotactic prohibition on the juncture of two vowels

between word forms in Irish. One must come to this conclusion although in some cases a *h* is used for hiatus purposes as in the nominative plural of vowel-initial nouns.[27]

(37) a.   NOM PL   *na héin*   'the birds'-MASC
                         na háiteanna   'the places'-FEM
                         muintir na hÉireann 'people of Ireland'

The reason for assuming that there is no such automatic phonotactic rule for vowel juncture is that the presence or absence of an intervocalic /h/ is exploited in those cases where different mutations may occur in the same environment. The feminine possessive pronoun of the singular takes zero mutation, i.e. it triggers neither lenition nor nasalization as opposed to the masculine singular and the plural forms of the same pronoun.

(38) a.   *a* 'his'   *a athair*   'his father'
            a 'her'   *a hathair*   'her father'
            a 'their'   *a n-athair* 'their father'

      b.   *a* 'his'   *a chara*   'his friend'
            a 'her'   *a cara*   'her friend'
            a 'their'   *a gcara*   'their friend'

This pronominal paradigm shows that hiatus /h/ is the exponent of zero mutation (i.e. neither lenition nor nasalization) with vowel-initial forms, while the lack of this /h/ corresponds to lenition with consonant-initial words. Nasalization has the regular manifestation of an /n/-prefix before a vowel-initial form.

      Prefix-*t* occurs furthermore with nominative singular of feminine nouns beginning with /s/ followed by a sonorant (i.e. /s/ + /l,n,r/). It is also to be found with masculine nouns in the genitive case. Note that these cases are both points in the nominal paradigms where lenition is required for both genders.

(39) a.   FEM NOM   *an tseachtain*   'the week'
                         an bhróg   'the show'
      b.   MASC GEN   *i lár an tsamhraidh* 'in the middle of the summer'
                         hata an mharcaigh 'the hat of the rider'

Nasalization and vowel-initial nouns. In present-day Irish a prefixed /n/ is to be found before nouns at those points in a paradigm where nasalization occurs. By these means nasalization has a realization before all segments bar sonorants.

(40)   GEN PL   *ceol na n-éan* 'song of the birds'
                      dath na mbád 'colour of the boats'

6   Analytical trends in Irish

Simplification in the verbal system. In the course of the history of Irish the blurring of phonetic forms has meant that with verbs formerly common contracted forms were resolved in Early Modern Irish to two separate forms.

(41) a. *atá* → *atá mé* 'I am'

     b. *ataoi* → *atá tú* 'you are', etc.

The many infixed pronouns become separated from verb forms and postposed in much the same fashion.

(42) a. *am mac* → *is mac mé* 'I am a son'

     b. *ro-m-chráid* → *ro-chráid mé* 'he has harassed me'

The complex system of verbal affixes (prefixes and infixes) is simplified. For instance the affix *ro* which rendered a preterite form perfect (Strachan, 1949:154) has been absorbed into the stem of the verb yielding a morphologically opaque form as with the dependent past of 'to be': Old Irish *ro-bá* → Modern Irish *raibh* (Strachan, 1949:71). During the Middle Irish period many affixes are reduced to a single prefix *do*. This was originally a verbal proclitic with the meaning 'to, for' which became attached to the beginning of a verb. The stress remained on the verb stem, hence the term 'deuterotonic' for such compound forms which had the stress on the second syllable (Quin, 1975:40). *Do-* always induced lenition as in Old Irish *do-beir* /do'vʲerʲ/ 'he gives' and later became in some cases absorbed into the verbal stem leading to a group of irregular verbs in the modern language. A more widespread development of *do* was its generalization as the particle for the past tense. It retained its leniting quality and was thus responsible for the lenition which is seen at the beginning of verbal stems in past and conditional forms in the present-day language. As a separate prefix *do* was retained well into the modern period and has only recently been lost (it is not included in the standard of Modern Irish). Inasmuch as *do* is lost lenition is not a conditioned change in the past of verbs but an integral part of the forms which indicate this category. This interpretation is strengthened by the fact that with vowel-initial verb forms and those which begin in /f/ a contracted form of *do* is mandatory in the present-day language.[28]

(43) a. *ithim* 'I eat' : *d'ith mé* 'I ate'

     b. *fágaim* 'I leave' : *d'fhág mé* 'I left'

Now on reflection one notes that both vowel-initial forms and those with a lenited initial /f/ have no consonantal onset in the past as in the latter case the /f/ is reduced to zero as the regular manifestation of lenition. The signal of the past at the beginning of the word stem is thus /d/, the reduced form of *do*. It is true that with initial /f/ the contrast /f/ : Ø for the present and past respectively would be sufficient to separate the tenses but the past forms of /f/-initial verbs would seem to have been associated with vowel-initial stems and obtained the /d/-prefix like these. These are really cases of double marking: /f/ plus lenition and then *d*-prefixation where in fact the lenition would have been sufficient.

     In the history of Irish there would appear to have been some confusion between vowel-initial forms and those with initial /f/ as this lenites to Ø. If speakers were exposed to a vowel-initial word they would not have been sure (without a context) whether this was vowel-initial in the citation form, i.e. without mutation, or whether it began with /f/. Thus one has many instances of an /f/ being added to the beginning of a word although there is no historical justification for it as speakers thought the form, as they were exposed to it, was lenited. The following are instances of this phenomenon.[29]

(44) *uacht* → *fuacht* 'cold'-NOUN

uar → *fuar* 'cold'-ADJ (Lewis/Pedersen, 1961:130)

adhb → *fadhb* 'problem' (de Bhaldraithe, 1945:114,
                    Thurneysen, 1946:134)

The situation in the present-day language. There is no doubt that the greatest analytical tendencies are to be seen in the verbal area in modern Irish.[30] Indeed in the spoken language there are more analytical forms than are recognized by the official standard (de Bhaldraithe, 1953:65ff.).

From the point of view of the mutational system the verbal area represents a system which is in transition. There is contrast in the initial consonants of certain forms, for instance the non-finite stem and the past tense of verbs differ in the lack of lenition in the former and its presence in the latter.

(45) a. *mol* 'praise'
      b. *mhol (mé)* '(I) praised'

For the full establishment of the mutations in the verbal system the key question is whether mutation is the sole differentiating factor in the person, number or tense of a verb form.

If one looks at the verbs of the first conjugation (which comprises a large proportion of verbs in the language) then one finds a syncretism in the endings of future indicative and present subjunctive and in conditional and past subjunctive. In the former this rests on the fact that the /f/ of the future inflection has become mute and the rest of the inflection is reduced to shwa.

(46) a. *molfaidh (mé)* [mʌlə (mʲeː)] '(I) will praise'
      b. *mola (mé)*   [mʌlə (mʲeː)] '(I) praise'-SUBJUNCTIVE

For the remaining major conjugation this situation does not apply as the inflection for the future has the phonetic form /oːi/ which it does not share with any other tense or mood. The conditional and the past subjunctive are also distinguished by differing vowels in their inflections.

Note that the only mutation which occurs with verb forms is lenition. This means that the normal three-way mutation system is reduced to two for verbs: zero mutation versus lenition.

Verbal syntax in Irish does however involve all mutations. The situation here is dominated by a whole series of particles which demand a mutation notably nasalization.

(47) *go* + N   *Dúirt sé go dtiocfaidh sé.* 'He said he would come'
                (/t/ *t* → /d/ *dt*)

      mura + N *Mura bhfuil tú in ann.* 'Unless you are able'
                (/f/ *f* → /v/ [w] *bhf*)

      dá + N   *Dá mbeadh sé abhaile.* 'If he were at home'
                (/b/ *b* → /m/ *mb*)

      nach + N *Nach dtuigeann tú mé?* 'Don't you understand me?'
                (/t/ *t* → /d/ *dt*)

| *ní* + L | *Ní thuigim an alt seo* | 'I do not understand this article' |
| | (/t/ *t* → /h/ *th*) | |

Mutation does not appear in these instances to be an exponent of verbal categories but a correlate of mutating particles. This is in sharp contradistinction to the nominal area where mutation is frequently the only indication of a category. Most of these particles also require so-called dependent forms of irregular verbs which are mutated just as the regular verb forms are.

(48)   a.   *An bhfaca tú mo mhac?*   'Did you see my son?'
              (/f/ *f* → /v/ [w] *bhf*)
         b.   *Ní bhfuil sé in ann teacht.*   'He is not able to come'
              (/f/ *f* → /v/ [w] *bhf*)

For the functionalization of mutation in the verbal area redundant concomitant mutation is not so important. What is of greatest relevance is whether mutation has become the sole differentiating characteristic of a point in a paradigm: person, number, tense or mood. Clearly the situation is not as far advanced as in the nominal area. Indeed as long as there are inflectional distinctions the motivation for this to occur is lacking. With the analytical tendency of the verb there are separate forms for pronouns to use with verbs so that number and/or person is very unlikely to be distinguished by mutation. The major tense distinctions between past, present and future are realized inflectionally and this system would appear to be fairly stable.

(49)   a.   1st. conjugation   Present: Stem + /ən/
                                      Past: Stem (lenited)
                                      Future: Stem + /ə/

         b.   2nd. conjugation   Present: Sten + /iːən/
                                      Past: Stem (lenited) + /ə/
                                      Future: Stem + /oːi/

But what would appear to militate against a further functionalization of mutation in the verbal area is the fact that there is only a two-way contrast present here, zero mutation : lenition. It is difficult to see how nasalization could become attached to verb forms at this stage of the language unless the nasalization induced by some of the verbal particles mentioned above became associated with a certain tense or mood through constant association with a certain particle with the subsequent loss of the latter. This kind of development would indeed be inkeeping with the typological development of Irish but for the present it remains of course speculation.

Phonetic attrition has by no means led to a mechanistic reduction of all unstressed syllables in Irish. There are instances in Irish of renewed differentiation of unstressed vowels to clearly signal morphological categories. The clearest example of this is to be seen with the so-called autonomous form of the verb in the past tense (above all in Western Irish). This is a kind of passive, a subjectless verb form much as exists in Finnish (Karlsson, 1979:172ff.). The endings for the autonomous form in the past are orthographically *(e)adh* which gives /ə/ regularly in Modern Irish.[31] But the vowel /uː/ (or the more archaic pronunciation with an approximant /əw/) has been generalized to act as a signal of this form (de Bhaldraithe, 1953:71,84,108).

(50)   *Bualadh leis san aerphort.*   'He was met at the airport.'
            Ø-met with-him at-the airport

7   Evaluation of typological shift

It may appear that the development of the mutational system represents a complication in the Celtic languages. This is only because of its unusualness in a cross-linguistic perspective. In fact the mutations represent a simplification. The basic drift in Celtic, as in Indo-European in general, has been from synthetic to analytic. In the verbal area this is straightforward and obvious. But for the nominal area it also applies if one re-interprets the typological shift.[32] The hackneyed pair of terms 'synthetic' and 'analytic' do not do justice to the changes in Celtic. If one tries to express the Celtic changes in the traditional terminology then what one has is synthetic to analytic in the verbal area and a re-arrangement within the inflection (synthesis) typical of the nominal area. The unifying factor here is morphological simplification. The mutational system which has replaced the inherited inflections is a three-way (Irish) or four-way (Welsh) system which is almost regular (Irish) in its phonological manifestation or indeed completely so (Welsh). The gain in terms of morphological simplification has been a reduction in the different forms of minor lexical categories, such as personal and possessive pronouns, and a corresponding reduction in the variety of declensional classes. This latter change is not directly related to the development of the mutational system but is in accord with the typological change of which the mutations are a part. The simplification of the verbal system has been alluded to above. That of the nominal area is to be seen in the reduction of allomorphy for case and number. The plural in Modern Irish affords a good example. In the course of its development Irish has generalized two endings /əxiː/ and /əniː/ as plural formations (Hickey, 1985:155f.) and these are those used in present-day borrowings from English. The development here as elsewhere in the language's morphology is simplification which, treated globally, can be seen to be the main thrust of typological shift in Irish and the other Celtic languages.

Notes

1   The languages to be considered are Irish, Scottish Gaelic, Welsh and Breton. The so-called revived languages, Modern Cornish (P-Celtic, close to Welsh) and Modern Manx (Q-Celtic, close to Irish) are not to be treated here. For these see Broderick (1993), George (1993) and George and Broderick (1993).

2   Note that the particles which induce mutation are not themselves subject to mutation.

3   Oftedal (1962:96f.; 1986:21) uses the terms 'incorporated' and 'projected' mutations to denote those instances in which there is no mutating particle present any more and those in which this is still the case.

4   It would seem that the writers of Old Irish realized that the lenition of fricatives was unusual inasmuch as these segments were of the type, i.e. fricatives, which

result from lenition with other segments. This can be seen in the fact that lenition of /f/ and /s/ is indicated in the St.Gallen glosses and later by the use of a *punctum delens*, a dot over the letter to denote lenition (Thurneysen, 1946:24). Note further that in Old Irish some instances of /s/ actually lenited to /f/. These were cases which derived from IE */sw-/ and */sp-/ (Hamp, 1951:232). Independent /f/ lenites in Old Irish to zero. Later all instances of /s/, irrespective of origin, lenite to /h/.

5   However this is later syncretism which arose on the loss of dental fricatives in Irish, see 4.4.1 *Disruption of system* below.

6   IE */p/ in Armenian reduced to Ø or to a glide *y/w* or in a few cases shifted to the ejective *p'* (Winter, 1992:113).

7   See Jackson, 1953:125-138 for a good summary of the arguments presented here.

8   This could be due to a perception of the Latin word as one with lenited /s/ as initial segment. This kind of misinterpretation is responsible for words like Modern Irish *fuacht* < *uacht* 'cold' with an initial /f/ 'restored' erroneously. For further comments see 3.7 *Analogical spread and regularity* and 4 *Analogical trends in Irish* below.

9   German scholars such as Pokorny (1925:17) refer to the period up to the Ogam inscriptions as 'uririsch' which can be rendered, as here, by Primitive Irish.

10   The assumption of a third *u*-quality is doubtful and I follow Greene (1973:132) in his assertion that this was certainly not systematic in Old Irish.

11   Lenition is blocked, however, by homorganic stops or sonorants as the oral closure of the latter prevents the 'opening' (lenition) of an adjacent consonant. /s/ also blocks lenition, probably due to the phonotactic prohibition on two fricatives in sequence which applies totally in Irish.

12   A further manifestation of lenition is found in Nivkh, a Paleo-Sibirian language spoken on part of Sakhalin Island and along a stretch of the Amur river (Comrie, 1981:266-272), where ejectives are lenited to fricatives (Jakobson, 1971:91-93). In terms of articulatory force this represents a weakening which Jakobson compares fleetingly with both Celtic and the West Atlantic language Fula (Jakobson, 1971:89f.). Note that Jakobson uses the older term Gilyak for Nivkh. For fuller treatment of Nivkh grammar see Panfilov (1962-65).

13   Geminates arose across word boundaries in Celtic and from sequences of stop and nasal, e.g. kŋ → kk, gŋ → gg. This is often explained as 'expressive gemination', an account with which many authors are unsatisfied (see for instance Kuryłowicz, 1957:132).

14   Assibilation of velars is recorded for a few areas of Breton with /k/ -> /ʃ/ before front vowels in the spirant mutation (Le Dû, 1986:441).

15 The position in Welsh is not as clear cut as the textbooks state and variation on a sociolinguistic and/or acquisitional scale would appear to exist. See (Ball, 1988a:76ff.; 1988b) on the former and Hatton (1988) on the latter.

16 Historically, this gemination is due to the final /-s/ of a preceding clitic. With a following vowel, the /-s/ lenited to /-h/ in a regular development and this /h/ then became attached to the initial vowel of the following lexical stem.

17 In the early history of Celtic there was some devoicing of labial and velar fricatives as seen in Old Irish with initial *veros* > *ver* > OI *fer* 'man' (Pokorny (1925:29). ɣ > x IE *tegos* > *teɣ* > OI *tech* 'house', Pokorny (loc.cit.); *fír* 'true', cf. Latin *verus* (Thurneysen, 1946:123). This is not, however, due to the operation of a mutation.

18 Both languages agree incidentally in not having voiced sibilants.

19 Non-polarized sonorants which derive historically from single consonants are still present in Modern Irish, e.g. *baile* [baːlə], *[baːlʲə], *duine* [dɪnə], *[dɪnʲə].

20 This is often not specified (see Ó Cuív, 1986 as a typical example) as it is taken for granted that readers know what type of segments are being referred to.

21 Petrovici's observations are supported by Halle and Jakobson in their supplementary note to his article.

22 In this position geminates would appear to survive longest. For English this is the view taken on the loss of phonological length in the Middle English period (Kurath, 1956; Kurath in Lass, 1969:143).

23 Watkins (1955:19) assumes that both voiceless and voiced geminates existed in Gaulish which would justify their postulation for an undifferentiated stage of Insular Celtic.

24 For Insular Celtic Greene (1966:116) assumes a twofold distiction in consonant quality: strong (long) and weak (short) which he symbolizes as K : k. The distribution was such that the strong version occurred stem-initially and the weak one intervocalically.

25 One of the few languages which would seem to have a systematic distinction between short, long and overlong among vowels and consonants is Estonian (see Lass, 1984:109; Lehiste, 1970:157 for a discussion of the interpretation of the distinction short : long : overlong).

26 The article in Modern Irish has the unified form *an* (from Old Irish *in, ind* or *ind*) for both masculine and feminine genders. This stems from a pre-Old Irish form with an ending in *-os* for the masculine and *-a* for the feminine (Thurneysen, 1946:294) hence the zero mutation for masculine and the lenition for feminine nouns. In some cases later changes affected the form of the definite article. In Breton it was originally *in* (Hemon, 1975:116) later *en, an*. In Middle Breton *an* becomes *ar* except where it precedes /h, d, n, t/ (Hemon, 1975:118) where it

remains *an*. Before /l/ it is realised as *al*. In Vannes it is *en* before /h/ but not when this is the result of mutation, e.g. *er hy* 'the dog' (< *gy* 'dog').

27   This is a synchronic analysis. Historically, Indo-European s → h before a vowel (Holmer, 1941:128). This accounts for /h/ in cases like *a h-ainm* 'her name' and *na h-aoise* 'of the age'. Also applies to the numbers *trí, ceathar, sé* '3, 4, 6' in Modern Irish.

28   Only the clitic form has survived in the present-day language. The tonic form *do* /dʌ/ has been lost entirely.

29   Sometimes an initial consonant in borrowing is taken to be a lenited form and 'restored', e.g. *taisteal* 'hackle' < English *hatchel*. Similar phenomena are attested from the history of English, for instance the false division of article and noun (in both directions) as in *an apron* < *a napron* and *a nickname* < *an ekename* (Onions, 1966:46+609) or the misinterpretation of singulars as plurals as in *pea* < *peas* and *cherry* < *cherise* (Onions, 1966:659+167).

30   On the verbal system of Old Irish, see Thurneysen (1946:326-494) on that of Middle Irish see Dottin (1913:109-206).

31   Historically, this could be a velar-labial shift (Hickey, 1984) of /əɣ/ → /əv/ → /əw/ which gave /uː/ by glide vocalization (Sommerfelt, 1962:347).

32   For the typological characterization of the Celtic languages it is sensible to regard these as incorporating two sub-typologies, one nominal and one verbal. Justification for such a procedure would seem to be offered by others languages in which a certain kind of change is prevalent in one sub-area more than another, e.g. the nominal simplification in Bulgarian (Aronson, 1968) which does not have a direct verbal counterpart.

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