15 Reanalysis and typological change

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1 Introduction

The concern of the present chapter is to examine the typological change in morphology which took place in Irish and which sets it off both from members of related Indo-European subgroups and partly from other Celtic languages, i.e. the P-Celtic languages. This typological change resulted in the rise of a system of initial mutations (a common Insular Celtic development) and the rise of functional palatalisation in Irish, in all probability as a reaction to the demise of inherited inflections from earlier stages of Celtic. This kind of typological change is quite unique among the Indo-European languages which generally have used other devices to accommodate the shift from synthetic to analytic type. The uniqueness of the Irish solution makes it worthwhile examining it as an instance of what constitutes a possible language change and so match the tenor of the other contributions to the present volume. The framework I am adopting is a broadly typological perspective which attempts at giving a unified interpretation of several apparently disparate phenomena which appear in the earliest history of Irish. The period at which the changes would seem to have begun is the immediately pre-Old Irish period (before 600) and the typological adjustment continued throughout the remainder of the recorded history of Irish albeit with disturbances due to developments on linguistic levels other than that of morphology.

I will proceed by looking at groups of phonetic/phonological changes between Ogam (the inscriptive language used in the pre-Old Irish period) and the earliest stages of Irish to see to what extent these are responsible for the typological reorientation of the language over a span of several centuries. Viewed from a high vantage point the developments can be summarised as phonetic attrition and loss at an early stage, followed by a basic realignment of the morphology of Irish with several readjustments in the period after the re-orientation had taken place, roughly in the course of the attested stages of Irish (from about 600 onwards). Importantly, this realignment can be viewed as the result of first language learners reanalysing the phonetic blurring which occurred at the beginnings of words (the product of phrase-level sandhi, Ó Cuív 1986) as being of systemic significance, in this case as the exponence of key grammatical categories, such as number, case, tense, etc.

The term reanalysis can be understood in different ways. In a syntactic sense, there is an interpretation which involves only surface structures, e.g. ‘Reanalysis is a mechanism which changes the underlying structure of a syntactic pattern and which does not involve any modification of its surface manifestation’ (Harris and Campbell 1995, Chapter 4 ‘Reanalysis’, p. 61). But for the present discussion, reanalysis is understood as the switch from one surface feature to another in the realisation of a grammatical category. In this scenario one has two features which appear together in one grammatical
context, for instance in an oblique case like the genitive or in the plural. Of these two features one is historically prior and is the inherited exponent of the category in question. The second is an attendant, non-central feature, usually derived from some allomorphic process like secondary articulation, for instance the fronting of vowels before /j/ and /i/ in following syllables, i.e. umlaut in North and West Germanic, or external sandhi, i.e. the initial mutations in Celtic. The shift is one of status. The low-level, secondary feature attains systemic status, normally because of the demise of the older feature, frequently through phonetic attrition, hence the functionalisation of umlaut in Germanic and of the initial mutations in Celtic on the decline of the inherited Indo-European inflections. In the terminology employed by Croft the shift is from an interpretation of features from ‘contextual’ to ‘inherent’, a case of ‘hypoanalysis’ (see his discussion of umlaut, Croft 2000: 126-9).

This scenario for reanalysis implies that the switchover must last for a period of time because both the former grammatical features – inflections in Germanic and Celtic – and the newer sub-systemic features – umlaut in Germanic and initial mutation in Celtic – must be present for language learners to reanalyse the newer features as the exponent of the grammatical category with which they co-occur in speech. The duration of overlap between the old and new systems is difficult to determine and remnants of the earlier grammatical exponents – inflections in Indo-European – may never be completely removed.

The beneficial effect of reanalysis, the maintenance of grammatical distinctions under threat of being lost, is an epiphenomenon of the reanalysis. The language learners in no way attempt to rescue the language system, rather they re-interpret distinctions in form. At some stage in the development of Celtic the initial mutations were re-interpreted as having systemic significance. The particular interpretation made depends on the grammatical contexts in which the mutations occurred, e.g. as the exponent of the genitive singular or the plural or the preterite. The goal was not to rescue a grammatical system but this was the effect of reanalysis.

In the following the details of this reanalysis are outlined. To grasp its workings it is necessary to start with Continental Celtic before the first remains of Irish appear and offer a brief characterisation of it.

1.1 Stress type and placement in Celtic

In common with Germanic and (pre-Latin) Italic, Celtic has initial stress accent (Salmons 1992: 146ff.). This is a feature which was already effective on the continent before the formation of Insular Celtic. There are no indications of a period of variable stress at some earlier stage as there are in the workings of Verner’s Law in Germanic for example. The placement of stress is on the first syllable which in Celtic is the root. In cases of prefixation the root maintains the stress. Initial stress among languages with stress accent often leads to a reduction and blurring in later syllables, in the case of Indo-European daughter languages in the inflectional endings (Lehmann 1992: 214). This reduction does not necessarily hold for languages which broadly show pitch accent, such as Finnish, because the contrast between accented and non-accented syllables is realised by a contrast in frequency pitch and not primarily by loudness and length as with stress accent systems. With the latter the non-accented syllables are generally shorter, something which contributes over time to their indistinctiveness and eventual loss.2
1.2 Developing alternative strategies

Given that language is an adaptive evolutionary phenomenon (Croft 1995: 137) it is understandable that if changes occur which are detrimental to the functioning of the system then language learners will undertake re-interpretations which are likely to counterbalance such effects. This would appear to be true irrespective of whether the disruption occurs because of a force within the language itself or for external reasons. In the specific case of Irish one has a rapid blurring and subsequent loss of inflectional syllables due to the natural phenomenon of phonetic weakening.3 The process in the pre-history of Irish moved quickly and homophony in such central areas as case marking or pronominal distinctions may well have existed. The following chart illustrates briefly how phonetic substance was lost in words from the very earliest attestations through Old Irish to Modern Irish. The second half of the chart shows instances of morphologically conditioned lenition as manifested in Modern Irish (essentially similar to Old Irish).

<table>
<thead>
<tr>
<th>(1)</th>
<th>Ogam</th>
<th>Old Irish</th>
<th>Modern Irish</th>
</tr>
</thead>
<tbody>
<tr>
<td>senobena</td>
<td>→ senben</td>
<td>→ seanbhean</td>
<td>‘old woman’</td>
</tr>
<tr>
<td>inigena</td>
<td>→ ingen</td>
<td>→ inion</td>
<td>‘daughter’</td>
</tr>
<tr>
<td>maqqos</td>
<td>→ maqq</td>
<td>→ mac /kk/ → /k/ ‘son’</td>
<td></td>
</tr>
<tr>
<td>cáin</td>
<td>/kɑ:n/</td>
<td>‘tax’ (feminine noun)</td>
<td></td>
</tr>
<tr>
<td>an chán</td>
<td>/ɔ xɑ:n]</td>
<td>‘the tax’</td>
<td></td>
</tr>
<tr>
<td>beag</td>
<td>/b]ag/</td>
<td>‘small’</td>
<td></td>
</tr>
<tr>
<td>an-bheag</td>
<td>/an]v]ag/</td>
<td>‘very small’</td>
<td></td>
</tr>
<tr>
<td>ró-bheag</td>
<td>/ro]v]ag/</td>
<td>‘too small’</td>
<td></td>
</tr>
<tr>
<td>brisim</td>
<td>/b]r]is]m]</td>
<td>‘I break’</td>
<td></td>
</tr>
<tr>
<td>bhris mé</td>
<td>/v]r]is] m]e:/</td>
<td>‘I broke’</td>
<td></td>
</tr>
</tbody>
</table>

In the transition stage from Continental Celtic to pre-Old Irish a reaction appeared to the attrition caused by phonetic weakening, that is the phenomenon came, through reanalysis, to be interpreted as systemic. The phonetic weakening in Irish was both word internal (no further consequences for the morphology) and, due to sandhi, word external. Grammatical elements such as determiners could induce lenition (shift of stop to fricative) at the beginning of the following noun or verb. Any such preceding element which originally ended in a nasal (such as the numerals 7, 9 and 10, cf. Latin septem, novem, decem) causes nasalisation (shift of voiced stop to nasal or voicing of a voiceless obstruent, see below) at the beginning of the following word.

1.3 Functionalisation of phonetic weakening

During the immediately pre-Old Irish period this phonetic effect was reanalysed and hence functionalised so that the contrast between lenition, nasalisation or no change was exploited for grammatical purposes. For instance, no phonetic change was typical of the masculine nominative and lenition was indicative of the feminine nominative as the original article in Celtic (and ultimately Indo-European) ended in an obstruent /-s/ in the first case and in a vowel /-a/ in the second. The sandhi between article and noun triggered lenition with the feminine article as the initial consonant was inter-vocalic in this instance.
The phenomena of lenition and nasalisation are conventionally referred to in combination as *initial mutations.* Basically, an initial mutation is a segmental change at 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 causing the mutation are usually grammatical words: articles, pronouns, particles of various types. 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.

### 1.3.1 Release from phonetic motivation

Functionalisation of a low-level phenomenon such as phonetic weakening has a number of consequences. One is that the original phonetic triggering is no longer necessary, that is, the phenomenon can occur in environments in which it would not have done so originally. For instance nasalisation in Irish would not have been triggered by the number 8 as this did not end in a nasal (cf. Latin *octō*) but in Irish it came to nasalise and so fit into the series of numerals which induce nasalisation of a following noun.

### 1.3.2 Blocking of further developments

Another consequence of functionalisation is that, after it is initiated, phonetic developments are then arrested. Thus /ɣ/, resulting from the lenition of /g/, does not disappear initially as it does word-internally in Irish (though it has in Welsh). /s/ does not lenite beyond /h/ as opposed to Andalusian Spanish, for example, which has /s/ → /h/ → Ø, e.g. *las casas*, [lah kasah], [la kasa]. With regard to palatalisation (see next section), /k/ does not assimilate to /ʃ/ via /tʃ/ as it has done in French, for instance, but remains a palatal stop /kʃ/, phonetically [c] (IPA).

The external sandhi which resulted in the Celtic mutations went hand in hand with a decrease in the lexical status of the mutating particles as these lost stress and phonetic distinctiveness. Given the phonological bond with the following mutated lexical word one would expect movement on the following morphologisation cline (Hopper and Traugott 1993: 132) with the particles ending up as prefixes or being lost completely.

(2) lexical item > clitic > affix

But while the mutating particles in Celtic share many of the characteristics of clitics (low phonetic profile, for instance) they do not undergo affixation. If they were absorbed by the following word this would lead to severe loss of grammatical function, to homophony and ambiguity of the kind which initiated the system of mutation in the first place. Such a development would have forced – within a comparatively short period of time – another typological re-orientation to compensate for this new kind of grammatical syncretism.

### 1.4 The development of palatalisation

A prominent feature of the phonology of Q-Celtic is the existence of two series of consonants, one palatal and the other non-palatal (phonetically velarised). The origin of these is quite straightforward: a high front vowel, typically an inflection in Indo-European, had the effect of palatalising the preceding consonant (usually the coda of the root) by articulatory assimilation. These endings were lost with palatalised
consonants remaining as their reflex in later forms of Q-Celtic. After this stage there was a phonemic contrast between palatalised and non-palatalised consonants. As with umlaut in Germanic, an attendant phonetic effect of an inflection became reanalysed as the marker of a certain grammatical category, for instance of genitive singular or nominative plural in Irish, like the plural or comparative in Germanic. Just as with the initial changes, there was a spread of palatalisation into domains not effected by the original phonetic palatalisation. This can be viewed as analogical regularisation after grammatical functionalisation.

1.5 Inherent deficiencies in the system

It is important to view the initial mutations as a reaction to a disturbance in the morphology of late Continental Celtic, indeed as a functionalisation of just this disturbance, phonetic weakening and external sandhi. It obviously was not a planned reaction and is in no way an artifact of speakers of Celtic at any particular stage. Hence one should not be surprised to find that the new grammatical system in Celtic had certain deficiencies. The most severe of these were evident in those words which started with segments which could not be fricativised, i.e. with sonorants. This is a source of ambiguity to this very day, where it is not possible to tell if lenition has applied to a sonorant-initial form. And of course nasalisation can only apply vacuously to words with an initial nasal. For instance in Modern Irish

\[(3) \quad a\ neart \text{ can mean } 'his, her, their strength'}\)

and the correct interpretation rests entirely on context.

Another deficiency in the mutation system is that there are instances of overlap, for example the result of leniting /p/ is /f/ which exists as an independent, non-mutated segment to begin with, thus a phian ‘his pain’ and a fíon ‘her wine’ are both phonetically /ə fíon/.

The point to note here is that the new system of initial mutation combined with the distinction between palatals and non-palatals at the end of word forms was nonetheless communicatively adequate.

1.6 Later disturbances of the system

Typological changes in languages move at different paces. If one neglects the extreme case of abrupt creolisation and the immediate establishment of SVO and nominal pre-specification for the moment, then one sees that syntactic typology moves fairly slowly (measured in centuries) and that morphological typology changes very slowly (measured in several centuries if not in millenia). Thus Nichols (1992) notes that clause alignment (nominative-accusative versus ergative-absolute) is something which shows great stability over time whereas word order changes at a relatively quicker pace but shows areal stability. This would seem to indicate that word order is a phenomenon which diffuses areally between languages. One reason for this could be that a language has many word order types at any one time: a basic one and others used for topicalisation purposes. There may occur a shift in status from topicalised to basic especially under the influence of another language which already has the order in question as basic. But with clause alignment a language either has the one order or it has the other (unless it is a case of ‘split ergativity’).

The upshot of the relative stability of morphological typology is that once it
establishes itself it has considerable momentum and a re-orientation requires a ‘life-threatening situation’ so to speak such as the collapse of pronominal distinctions or the syncretism of case marking for subjects and objects. In Irish the shift away from the original suffixal inflection strategy inherited from Indo-European towards the new system of grammatically relevant alterations at the margins of words (initial mutation at the beginning and palatalisation vs. non-palatalisation at the end) has shown remarkable stability throughout the entire period of attested Irish (roughly from 600 to the present-day).

This stability has been threatened on a number of occasions. Despite the gravity of changes which impaired Irish morphological typology the system has survived and adjusted itself to the altered circumstances.

The first disruption of the system was the loss of phonological length during the Middle Irish period. Exact dating is difficult here. In the present context it suffices to point out that in Old Irish there existed long consonants, in particular long sonorants and that a potential contrast (Feuth 1983, Greene 1956) existed between long and short sonorants which could have been interpreted morphologically as the difference between a non-lenited and a lenited segment. After the Middle Irish period this option no longer existed.

The second disruption was initiated by the shift, again in the Middle Irish period - this time probably towards the end (O’Rahilly 1926) - of the ambidental fricatives /θ/ and /ð/. Note that these segments were the result of leniting /t/ and /d/ respectively in Old Irish. The shift was to /h/ in the case of the voiceless dental fricative and to /ɣ/ in the case of the voiced one. The shifts resulted in homophony as the output of leniting /s/ was /h/ and of /g/ was /ɣ/ already.

(4) a. a thuí /ə hiː/ ‘his straw’
   a shuí /ə hiː/ ‘his sitting’

b. a dhaol /ə ɣiːl/ ‘his beetle’
   a ghaol /ə ɣiːl/ ‘his relationship’

One can speculate on why these shifts should have occurred. Cross-linguistically (at least in Indo-European) there is more of a tendency for languages to lose ambidental fricatives than to develop them. The continental Germanic languages (bar Danish) are a good example of this. Here the original fricative input - ultimately deriving from Grimm’s Law - was strengthened to a stop (German, Dutch, Swedish, Norwegian). Equally the Romance languages (bar Spanish and central Italian dialects) have lost ambidental fricatives which had resulted from lenition stages in their development from the regional forms of Latin which provided their various starting-points.

The Irish case is a good example of competing motivation. A natural phonetic development, the demise of segments with low acoustic prominence, compare the slight phonetic salience of /θ/ with that of /s/ or /ɣ/ which is much higher, disturbs the morphology of the language (a different linguistic level) which then adjusts accordingly.

The central question here is just how much homophony a language subsystem like morphology can tolerate before a major re-orientation becomes imperative. The wholesale loss or blurring of grammatical suffixes would seem to be criterion enough, witness the development of the Irish mutational system from a Continental Celtic starting point in the first place. The historical phases of Irish, however, show that considerable homophony can be accommodated in a language, more than is frequently assumed by
linguists. For instance the re-shuffling of the pronominal system in late Old English was largely motivated by a threatened or actual homophony of pronouns for the third person singular and plural. This is probably the degree of homophony which triggers a remedial response from speakers (promotion of dialect she and borrowing of northern forms with initial th-). However one should be careful not to assume that homophony anywhere in the morphology will initiate a therapeutic reaction. The Irish case shows that complete homophony for the third person possessive pronouns with sonorant-initial nouns (recall the example of a neart ‘his, her, their strength’) was not enough to provoke such a reaction. It is probably only when exhaustive contextualisation is insufficient that a closed-class subsystem like morphology will be forced into a major re-orientation. Furthermore, one should note that language contact such as that of English with Scandinavian and French is not necessary to trigger widespread typological re-orientation. In the case of Celtic there is no direct evidence that the system of mutation and, in Q-Celtic that of palatalisation/de-palatalisation, is the result of any kind of substratal transfer.10

2 A morphological typology of Irish

This section of the present chapter is concerned with describing in principle how the morphology of Modern Irish works, especially in view of the developments which have been discussed so far. It should be emphasised that this system is essentially the same as that for Old Irish. Both the mutations and palatalisation/de-palatalisation existed in the older form of the language. The former were not indicated consistently, or at all, in the orthography and other aspects of Old Irish morphology, such as its complex verbal system, cloud the picture. In addition much regularisation has taken place so that Modern Irish is a more consistent and symmetrical language from the point of view of its morphology. One important reason for this is that the phonetic attrition which represented the initial momentum for the typological re-orientation continued and eliminated virtually all instances of suffixal inflection in the nominal area - except for productive endings, such as /-e/, which now can be interpreted as root extensions rather than inflections in their own right. Case endings were blurred and lost, for instance there is no dative ending in Modern Irish, and in the verbal area very considerable simplification of forms occurred reducing productive morphology in this area and leading to an attendant increase in lexicalisation.

When describing Modern Irish one finds that the categories of conventional morphological typology, inflecting, agglutinating, etc., are not entirely adequate as they do not capture the central features which characterise the organisation of Irish morphology. Instead of trying to adapt traditional terms I offer an alternative method of characterising the inflecting morphology of Irish which is based on an analysis of the means which it uses for signalling grammatical categories such as singular and plural, various cases, conjugational forms of verbs and the like.

The outset for any consideration of Irish morphology is the phonetic attrition which set in at the earliest stages of the attested language, between Primitive Old Irish and the Old Irish period proper as outlined above, this attrition leading to a loss of profile with inherited Indo-European inflections.

For the new typological principle which arose in Irish I use term base margin alteration which involved the functionalisation of phenomena at the beginning and end of words, hence the qualifier ‘margin’: To talk of ‘words’ in this connection is too inaccurate. The alterations which became the central part of the language’s grammar affected the base form in any paradigm.
2.1 Base and root

Base Taking the first major category, nouns, one can state that the base is the unaltered form of the noun, nominative case, singular person, citation form for a dictionary, i.e. it can stand alone. It may consist of one or two syllables (in rare cases three). If two or more then the second (and third) is a root extension. The latter does not usually carry any lexical information and only has a few manifestations, typically /ɔx/.

Root This is a base minus its extension, if present. The lexical part is the root and is identical with the base in monosyllabic forms.

Transparent root extensions /ɔx/ → /i:/ + palatalisation
historically /iç/ -> /ij/ -> /i/:  

marcach : marcaigh ‘rider’-NOM : ‘rider’-GEN
báisteach : báistigh ‘rain’-NOM : ‘rain’-GEN

Opaque root extensions

Examples are eolas ‘knowledge’, samhraidh ‘summer’, amadán ‘fool’: Some of these may be old Latin loans as in peaca ‘sin’ (from peccatum), airgead ‘silver’ (from argentus), anam ‘soul’ (from anima).

Others are Anglo-Norman loans from the Middle English period. séipéil ‘church’ (from chapel), seomra ‘room’ (from chambre).

Depalatalisation can include the adding of a root extension as with 5th declension nouns: rial : briseadh na rialach ‘rule’ : ‘breaking of the rule’:

2.2 Type of alteration

The base form of any paradigm can undergo various alterations when indicating different grammatical categories. In this connection one should note that at the beginning of a base a mutation can occur. At the end of a base a change in consonantal quality may appear. By the latter term is meant a change from palatal to non-palatal or vice versa with any consonant.

Changes in consonantal quality A prominent feature of Irish phonology is that all consonants, except /h/, occur in palatal and non-palatal pairs. There are no affricates. Voiceless fricatives are primary, voiced ones are derived by mutation, i.e. /v/, /s/ and /x/ are primary and occur in lexical forms, whereas /v/ and /y/ (and /x/ in initial position) are secondary and only arise due to mutation. /s/ alternates with /h/; there are no voiced sibilants in Irish.

The distinction between long and short vowels is phonemic. With short vowels the system is basically threefold /i/ : /a/ : /u/. The distinction between /i/ and /e/ is weak. [A] and [u] do not contrast but vary according to ambient consonantal quality. A final unstressed short syllable always has /a/ as its vowel.

Long vowels have a five-way distinction: /i:/ - /e:/ - /æ:/ - /o:/ - /u:/.

Diphthongs...
(/ai/ and /au/) have arisen (i) through absorption of lenited consonants into the nucleus of a syllable or (ii) because of on-glides to palatal or non-palatal (velarised) consonants.

Now the changes in consonantal quality involve a consonant which is non-palatal becoming palatal or one which is palatal being de-palatalised. Phonetically non-palatal sounds are velarised to improve phonetic contrast. Palatalisation in Irish only involves a change in the feature [palatal]. There is no assimilation or affrication with palatalisation as in Slavic languages. Note that as the language has palatalisation as a grammatical phenomenon, e.g. when forming the genitive or plural, non-palatal consonant quality is systemically significant (on the right margin of words) and should not be considered as somehow ‘neutral’. In the following simple examples the final consonant in the singular is non-palatal, /k/ and /x/ respectively. In the plural this changes to /kʲ/ [c] for the first word but to /iː/ (see remarks under ‘Root’ above) for the second so that with many words in present-day Irish, grammatical palatalisation is no longer phonetic palatalisation due to various historical changes (here: vocalisation of a final palatal fricative).¹¹

(5)  Sg (non-palatal)  Pl (palatal)
    a.  cnoc       ‘hill’  cnoic       ‘hills’
    b.  marcach    ‘rider’ marcaigh    ‘riders’

2.3 Initial mutations

By initial mutation is meant a change in the manner and possibly place of articulation of a consonant at the beginning of a word. As mentioned above such changes were originally sandhi phenomena, i.e. the intervocalic voicing of voiceless segments or the fricativisation of voiced ones. This is paralleled by the nasalisation of words preceded by nasals. Inflections play a secondary role and are phonetically reduced. In Modern Irish the phonological parameters which vary are (1) voiced, fricative or nasal quality for syllable onsets and (2) palatal versus non-palatal quality for syllable codas. This leads to Irish becoming a type in which morphological categories are indicated by a change in the margins of root syllables. This principle functionally links initial mutation and changes in consonant quality (palatal versus non-palatal) at the ends of bases. Suffixal inflection, typically /-o/ or /-iː/, is only retained for those cases where there is no change in the value for [palatal] in the coda of a base syllable, for instance with the plurals of many nouns, e.g. lámh ‘hand’ : lámha ‘hands’:

2.3.1 Lenition

Lenition in Irish essentially involves the change of stops to fricatives; this is both a diachronic phonological process and part of the synchronic morphological process which is the concern in the present section. All stops in the language can become fricatives in an environment for lenition. In addition, /f/ lenites to zero and /s/ lenites to /h/. The only sonorant which is affected by this change is /m/ which can lenite as the language has a homorganic (voiced) fricative, namely /v/. Alveolar sonorants do not lenite. The velar nasal does not occur in base forms word-initially so the question of lenition does not arise.

2.3.2 Nasalisation

This is a process which affects consonants and not vowels to which the term usually refers in other languages. By nasalisation is meant that a voiced stop is changed to its
nasal equivalent under certain grammatical circumstances, i.e. the feature [nasal] is set to a positive value. Consider a case like the following.

(6) \textit{seacht ndún} ‘seven castles’

If one compares \textit{seacht} with Latin \textit{septem} one sees that there was originally a nasal at the end of this word which caused the following consonant of a noun to change to a homorganic nasal. With voiceless segments only the first stage of nasalisation takes place, i.e. these are voiced, contrast the items under a. and b. below.

(7) a. \textit{capall} : \textit{a gcapaill} ‘horse’ : ‘their horses’
    b. \textit{gúna} : \textit{a ngúnaí} ‘dress’ : ‘their dresses’

Synchronically the rule is as follows: Alter one feature in a segment. This leads to nasalisation of voiced segments, /b/ → /m/ for instance, but to voicing of voiceless segments as voice is a precondition of nasalisation. It stops here as only one change is legal. Needless to say if a word begins with a nasal anyway the nasalisation mutation has no effect.

(8) Nasalisation

<table>
<thead>
<tr>
<th>voiceless</th>
<th>voiced</th>
<th>nasal</th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>b</td>
<td>m</td>
</tr>
</tbody>
</table>

Nasalisation only applies to stops; fricatives and nasals are unaffected with the exception of /f/ which nasalises to /v/ for example:

(9) a. \textit{fir} : \textit{caint na [v-] bhfear} ‘men’ : ‘talk of the men’
    b. \textit{focal} : \textit{a [v-] bhfocail} ‘word’ : ‘their words’

/s/ to /z/ is not an option, given the absolute prohibition on voiced sibilants in Irish both in its history and its contemporary form. /x/ to /y/ does not occur because word-initially /x/ is itself the result of lenition and cannot therefore form the input to a further mutation.

Note that as certain consonants occur both independently and as the result of mutation there are instances of primary and derived segments in Irish.

(10) a. Primary nasal \textit{maith} /ma/ ‘good’
    b. Derived by mutation \textit{a mba} /ə mə/ ‘their cows’

2.4 Manifestation of the initial mutations

Lenition and nasalisation are general phonological processes. Whether they are implemented depends on the segments they are applied to. The result must always be a legal segment in the language. Of course appropriate segments could have developed over time. But Irish phonology is quite conservative (it has lost dental fricatives and has no voiced sibilants and no affricates), cf. Welsh which has developed voiceless liquids. Only obstruents and the bilabial nasal /m/ are affected by lenition and nasalisation. Of the two mutations, the latter is phonetically more regular.
(11) **Lenition** | **Nasalisation**
--- | ---
1) p, b → f, v | 1) p, b → b, m
2) t, d → h, ɹ | 2) t, d → d, n
3) k, g → x, ɹ | 3) k, g → g, ɻ
4) f → 0 | 4) f → v
5) s → h
6) m → v

2.4.1 **Anomalies in the mutation system**

**Sonorants** These segments undergo neither lenition nor nasalisation and so morphological categories must be recognised from the context.

(12) a. *a rún* ‘his, her, their secret’
    b. *a láma* ‘his, her, their hands’

While it is true that lenition does not affect words (i) beginning with a vowel or (ii) beginning with a cluster with an initial /s/, the pressure of morphological distinctiveness would seem to have led to the establishment of a prefix /t/ before certain noun forms. The rules are approximately as follows. /t/ is prefixed to vowel-initial nouns after the article when lenition would not have applied.

(13) a. *an t-arán* /ə taraːn/ ‘the bread’ (masc, nom)
    b. but: *an áit* /ən aːt/ ‘the place’ (fem, nom)

Certain prepositions cause this rule to be waived.

(14) a. *an t-am* ‘time’, but *ag an am* ‘at the time’
    b. *an t-im* ‘butter’, but *leis an im* ‘with the butter’

Prefixation to a noun with an /s/-initial cluster only applies where there would be lenition. Note that prefix /t/ overrides lenition in cases of /s/ + V.

(15) a. *an tsláinte* ‘health’ (FEM, NOM)
    b. *an tslí* ‘the way’ (FEM, NOM)
    c. *in aice an tsiopa* ‘beside the shop’ (MASC, GEN)
    d. *an tseachtain* not: *an sheachtain* ‘the week’ (FEM, NOM)

Nasalisation is realised before vowels as a prefix /n/. Here it contrasts with lenition which has no manifestation before vowels. However, the lack of lenition before a vowel-initial word is realised as *h* in the genitive of nouns and with the possessive pronoun ‘her’, compare the following contrasting forms.12

(16) *a aois* ‘his age’ : *a h-aois* ‘her age’ : *a n-aois* ‘their age’:
2.5 Base margin alteration

Left margin alteration               (1) Lenition               (2) Nasalisation
Right margin alteration              (1) Palatalisation         (2) De-palatalisation

<table>
<thead>
<tr>
<th>Base onset</th>
<th>Base nucleus</th>
<th>Base coda</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>C-</td>
<td>-V-</td>
<td>-C</td>
<td></td>
</tr>
<tr>
<td>voiceless stop</td>
<td>palatal</td>
<td>(affects any type of consonant)</td>
<td></td>
</tr>
<tr>
<td>voiced stop</td>
<td>non-palatal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fricative</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nasal</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Initial mutation with manner of articulation
affected (rarely place) consonant quality alters; pairs exist for all consonants (except /h/)

The changes in the quality of the base coda do not affect the quality of preceding long vowels but do with short vowels. These shift from a front to a back articulation or vice versa depending on the nature of the quality change of the final consonant or cluster. Furthermore, short front vowels may diphthongise to /ai/ and back short vowels to /au/ on a change of consonant quality.

(17) Base: báis ‘death’

<table>
<thead>
<tr>
<th>Onset</th>
<th>Coda</th>
</tr>
</thead>
<tbody>
<tr>
<td>a bháis ‘his death’</td>
<td>Lenited Non-palatal</td>
</tr>
<tr>
<td>a bás ‘her death’</td>
<td>Neutral Non-palatal</td>
</tr>
<tr>
<td>a mbáis ‘their death’</td>
<td>Nasalised Non-palatal</td>
</tr>
</tbody>
</table>

am a bháis ‘the time of his death’ Lenited Palatal
am a bás ‘the time of her death’ Neutral Palatal
am a mbáis ‘the time of their death’ Nasalised Palatal

Older loans in the language always undergo base margin alteration as if they were native words.

(18) a. páipéar : dath an pháipeir ‘paper’: ‘colour of the paper’
b. peann : barr an phinn ‘pen’: ‘tip of the pen’

2.5.1 Root extension and remnants of older patterns

If root extension for an inflected form of a word coincides with base margin alteration compared with the uninflected lexical form, then this always involves a transparent extension, in effect /əx/ in Modern Irish as in the following examples.

(19) a. cáin : méid na cánach ‘tax’: ‘the amount of tax’
b. beoir : blas na beorach ‘beer’: ‘the taste of the beer’
c. traein : uimhir na traenach ‘train’: ‘the number of the train’
Base extension may trigger syncope if the phonotactic conditions are right, e.g. when an obstruent and sonorant come together.

(20) a. *eochair : cuma na h-eochrach* ‘key’ : ‘shape of the key’

There are remnants of a consonantal inflection (*n* or *d*) for a few nouns as in:

(21) a. *comharsa : iníon na comharsan* ‘neighbour’ : ‘the neighbour’s daughter’
   b. *cara : ainm an charad* ‘friend’ : ‘name of the friend’

2.5.2 Scope of base margin alteration

Base margin alteration applies above all to the area of nouns and adjectives. With verbs one still has inflections, but these are often uniform for a tense and furthermore all consonant-initial verbs show lenition in the past.

The principle of base margin alteration applies to those categories which involve a binary distinction such as nominative versus genitive. An inflectional short vowel is often retained for a third category, usually the plural.

With verbs base margin alteration is used to indicate the difference between present and past as the latter has lenition as its distinctive inflection. The future is irregular, very often with suppletive forms or an ending /hə/ which is added to the root. In a system where lenition is a marker of a certain tense, here the past, the absence of lenition becomes significant. Thus the lack of lenition in the present and future in Irish contrasts with the situation for past forms.

Initial mutation or the lack of it applies to all persons and both numbers in verbal paradigms. It also applies to the two main conjugational types which exist in Modern Irish. These differ in the inflections they show, but agree in the use of initial mutations. Finally note that nasalisation does not occur with independent verb forms but is frequently triggered by pre-verbal particles such as clause relativisers or a variety of adverbial forms.

(22) a. *Lenition* Past, Imperfect, Conditional
   b. *No lenition* Present, Future, Subjunctive

A consequence of this system of base margin alteration is that consonants have been foregrounded in Irish phonology and vowels downplayed accordingly. For the present-day language one can say that the vowel length difference is still systemically relevant but among short vowels there is really only a binary difference between a front vowel [i] or [e] governed by a following palatal consonant and a low-back vowel [a] or [u] governed by a following non-palatal (velarised) consonant.

(23) a. *fliuch* [fʰlɪʃ] ‘wet’ *nios fliche* [fʰlɪʃə] ‘wetter’
   b. *muc* [mɒk] ‘pig’ *muice* [mɒkə] ‘pig’-GEN

3 Irish developments in a broader perspective

When viewed cross-linguistically one sees that the morphology of Irish is unique in its combination of features. While palatalisation/de-palatalisation is a common axis along
which to differentiate sounds (Bhat 1978) the initial changes are very seldomly found with a grammatical function (Andersen 1986).

Palatalisation is a natural assimilation phenomenon whereby the feature of highness spreads from a vowel to a consonant, usually preceding. It establishes itself most easily with coronal sonorants and fricatives, probably because the secondary articulation is most easily perceived with these segments, witness the many palatal sonorants in Romance languages and the common distinction between /s/ and /ʃ/ in many languages. The functionalisation of palatalisation is not that uncommon: within Indo-European it is found on a wide scale in Celtic, Slavic and Indo-Iranian. With those languages in which it attains a grammatical function it is usual to find a secondary palatalisation of labials with tense lips and a brief [j] on release of the labial as the phonetic correlates of phonological palatalisation, cf. Irish and Russian (Jones and Ward 1969).

The initial mutations are cross-linguistically much rarer. Those languages of which one knows that such alterations of word initial segments have attained a grammatical function are few and far between. Apart from Celtic, there is Fula (possibly with Serer), both West Atlantic languages spoken mostly in Nigeria and Ghana (Sapir 1971, Anderson 1976) and there is Nivkh (formerly called Gilyak), a language isolate in the Paleosiberian group spoken along the lower reaches of the Amur river and on part of Sakhalin Island (Panfilov 1962-1965, Jakobson 1971). Berber is a language (or group, depending on the interpretation of internal differences) in which there is an alternation at the beginning of nouns depending on syntactic contexts (what is called free and annexed in the relevant literature, see Basset 1952). There are also instances of initial mutation recorded for Burmese and several Oceanic languages (Terry Crowley, personal communication).

The functionalisation of initial mutation implies that it has taken over from other grammatical devices which have been lost or at least defunctionalised in a language. The pre-stage to this state can be seen in several dialects/languages. For instance the so-called gorgia toscana in Tuscan Italian comprises fricativisation and gemination of initial segments of a noun depending on the original form of a preceding grammatical word. Thus the feminine article la causes fricativisation (la casa /la xasa/) and the preposition a (← Latin ad) triggers gemination (a porta /a pporta/ ← Latin ad portam), Lepschy and Lepschy (1986). Here one can see what a mutational system looks like embryonically. In order for the functionalisation of initial mutation to be grammatically adequate at least three distinctions must be possible.

(24)                                          Irish       Tuscan Italian
                    a. zero mutation
                    b. mutation 1  lenition  lenition
                    c. mutation 2  nasalisation  gemination

A language may have more than three distinctions, for instance Welsh divides lenition into (i) fricativisation and (ii) stop voicing and has nasalisation anyway, this resulting in three mutations, that is with zero mutation, a four-way system of distinctions.

For initial mutations to become the dominant means of indicating grammatical categories in a language a minimum of three distinctions is necessary which is probably why systems with only two distinctions, say no change and initial fricativisation, simply do not qualify as candidates for typological re-orientation. Of course a three-way distinction is a necessary but by no means a sufficient condition for functionalisation. Here a look at the phenomenon of consonant gradation in Finnish is fruitful. There are
four types, divided into two groups: gradation proper and assimilation. These consist of
the following processes: 1) simplification, 2) voicing and fricativisation, 3) vocalisation.
But the gradation occurs word-internally in Finnish. It is triggered by a closed short
syllable which leads to the phonetic reduction of the consonants preceding it. Such a
short syllable is typically represented by an inflection, such as the genitive, cf.

(25)  jalka ‘foot’ : jalan ‘foot’-gen

Now the agglutinative suffixes of Finnish are of course still present as opposed to
Estonian which, due to the loss of final inflections, has opacified gradation as a
synchronic process. The upshot of this is that there is no immediate motivation to
functionalise gradation in Finnish and hence its application is not exceptionless. For
instance not all loan-words undergo gradation, cf.

(26)  auto ‘car’ : auton ‘car’-gen and not *audon

Finnish consonant gradation is not word-initial and depends on syllable structure rather
than on external sandhi as does Celtic mutation. But it has enough distinctions for
functionalisation to be effective if there was decay of the inflectional suffixes. The great
imponderable remains of whether a language would go down that path, even if it had the
requisite means to do so.

Lastly a few remarks on the relationship of morphological to syntactic typology
are called for. The re-alignment of morphology which has been the topic of this chapter
took place at roughly the same time (during the immediately pre-Old Irish period) when
the syntax of Irish moved from an inherited SOV basic word order with pre-specification
(as is largely attested in Continental Celtic) to the reverse of this, namely VSO and
consistent post-specification for nominal dyads (noun plus genitive, noun plus adjective,
etc.). There are various views on this (Hickey 2002), from a language internal one which
depends on topicalisation, the operation of Wackernagel’s Law and the drag of
second-place clitics on verbs to the front of the sentence to an external account which
appeals to a pre-Celtic substrate which was already VSO and post-specifying (the
Afro-Asiatic substratum hypothesis). The relative merits of these views are in the
opinion of the present author irrelevant to the morphology of Irish. The changes in the
latter were effected to deal with gender, case and number marking with nouns and tense
marking with verbs and so was independent from any forces operative in the
re-positioning of clause constituents, the domain of syntactic typology.

4 Conclusion

The rise of a system of initial mutation for the indication of grammatical categories is
statistically unusual across the world’s languages. However, within the context of
developments in early Celtic, it can be seen as something which is fairly natural. The
phonetic blurring, which led to the demise of inherited inflections, was something which
not only affected the ends of words but also led to a reduction of the beginning of words.
This originally sub-phonemic process came to be interpreted by language learners as
systemic so that the indication of grammatical categories switched from suffixal
inflection to initial mutation. This is a good case of reanalysis during first language
acquisition which when, viewed externally, might be interpreted as a case of typological
repair, but which from the speaker perspective shows how language learners can come to
interpret cues about the system of the language they are acquiring, leading to a set of principles from different those determined by previous generations. There are a number of theoretical issues which result from this scenario, the most important of which concerns whether there was a period of overlap during which one or more generations had both systems in parallel favouring the new one of initial mutation and backgrounding the older one of suffixal inflection.

Notes

1 The terms Q-Celtic and P-Celtic refer to the differential treatment of Indo-European /kw/ in the Celtic languages. The former retained the velar stop from this complex segment while the latter lost it and closed the /w/ element to a stop, yielding the /p/ which is characteristic of it.

2 The distinction here is a rough and ready one. Among so-called stress accent languages one can note considerable differences, just recall the reduction of short unstressed vowels in English to shwa and their retention in German as an example (Hickey 1995).

3 I am not addressing the question here as to whether this propensity for weakening was a contact phenomenon as there is no reliable means for establishing this at such great time depth. The situation is different with the co-existence of Celtic and English in the Old English period where one can make a case for a low-level influence of the former on the latter (Hickey 1995).

4 These mutations are common to all the Celtic languages (Hickey 1996). In my opinion they can hardly represent a shared innovation in each individual language as the probability of this occurring, given the statistical rarity of the phenomenon across the world’s languages, is very slight indeed. The only other plausible explanation is that the seeds of the later functionalisation were present in Continental Celtic (as sub-phonemic phenomena) before part of it branched off into Insular Celtic. Furthermore, the beginnings of the mutations must be postulated as common to both P- and Q-Celtic.

5 The two major divisions of Celtic are conventionally labelled P-Celtic and Q-Celtic. These designations derive from the treatment of original /kw/ in Brythonic and Goidelic, very roughly the British and the Irish-Scottish forms of Celtic respectively. In Goidelic (and in Celtiberian) the inherited labialised velar 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 seen in Old Welsh map (< Modern Welsh mab) and Irish mac /-k/ ‘son’; Modern Welsh penn /pen/ and Modern Irish ceann /k\'ann/ ‘head’: Irish later reintroduced the bilabial stop via Latin loans like pian ‘pain’ or pôg ‘kiss’ (< pacis) and still later via Anglo-Norman loan-words like piosa ‘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).

6 In Old Irish there was a distinction of phonemic length among sonorants and phonological lenition, i.e. the grammatical principle, may well have had as its phonetic exponence the degemination of long sonorants, eg /ll, nn, mm/ + Lenition \rightarrow /l, n, m/, for a fuller discussion of this see Hickey (1996).

7 In the realm of syntactic typology Irish poses an interesting problem: the development of VSO and nominal post-modification may well have been the result of substratum influence from a language of ultimately Afro-Asiatic origin already in Ireland before the
arrival of the Celts. Various older authors such as Pokorny and Wagner have supported this view and it has received recent attention from Theo Vennemann who adheres to it (see Vennemann 1997 for example). The standard language-internal interpretation is outlined in Watkins (1963). Ahlqvist (1980) sees cleft sentences as providing the model for a generalised VSO word order.

An exception is the dialect of the north-west, that roughly comprising the country of Donegal today, which according to many scholars (Wagner 1979 and Ó Baoill 1979) still retains a length contrast for sonorants.

One view sees the lenition in Celtic and in western Romance as being linked, cf. Martinet (1952) and Ternes (1977).

This matter is not quite as simple as I am presenting it here. If one accepts that the pre-Celtic language(s) of Ireland was/were of an ultimately Afro-Asiatic origin then one could see in the functionalisation of secondary articulation, leading to the grammaticalisation of palatalisation/ de-palatalisation, a parallel to that of the distinction between pharyngealised and non-pharyngealised consonants - and their functional exploitation - in Afro-Asiatic languages like Arabic. This could mean that the functionalisation in Irish was influenced by the model of a precursor language or languages in Ireland.

Similar information on the morphology of Modern Irish can be gleaned from existing grammars. In English the best practical grammar is that of the Christian Brothers (1977) while the best descriptive grammar of a living dialect is de Bhaldraithe (1953) which, however, is in Irish.

The third person possessive pronouns represent one of the clearest cases of the original phonetic conditioning which lead to the mutations. It will be remembered that the possessive pronouns have their origin in Indo-European in the genitive of personal pronouns which was used for this purpose. The reconstructed forms are as follows (Szemerényi 1989:219): esjo Sing Masc, esjas Sing Fem, eisom Plural. Reflexes of these can be seen for the singular in Sanskrit asya, asyās and in Greek in the non-reflexive personal pronouns. In Irish for the oldest stage of the language these forms had already been reduced to a single sound a /a/ (Thurneysen, 1946:278) with lenition as a reflex of the final vowel of the masculine, prefixed h as a reflex of the final -s of the feminine and nasalisation in the plural as that of the final nasal in the original Indo-European forms.
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