# 4 Old Irish short vowels and consonant qualities

## 4.1. Introduction

In this chapter the system of short vowels of Old Irish will be examined. The most commonly accepted view is that the phonological system of this language consists of five short nuclei: [i], [e], [a], [o], [u], which are orthographically represented by the letters *i*, *e*, *a*, *o* and *u*, respectively. These vocalic expressions, if they occur in stressed position, that is, in the first syllable of the word, at times alternate with others, e.g. [e – i] in the pair [fʲer]/ [fʲirʲ] *fer*/*fir* – 'man'/gen.sg., under conditions to be discussed below. None of them ever alternates with zero. The same five letters stand for short unstressed vowels which may alternate with zero, e.g. [u – ø] in [dʲeṽun]/[dʲeṽne] *demun*/*demnae* – 'devil'/gen.pl., or with other vowels, e.g. [dʲlʲiɣʲiðʲ]/[dʲlʲiɣuð] *dligid*/*dligud* – 'law'-gen.sg./dat.sg.

Unlike in contemporary languages, where we can be certain of the exact pronunciation of lexical items, in Old Irish the actual quality of some sounds, especially those which undergo reduction as a result of being unstressed, is unlikely to be established even through a thorough phonological analysis. Thus, the goal of the ensuing discussion is not to discover the precise details of ancient phonetics but, rather, to try to understand the general workings of the vocalic system.

It is the aim of any phonological study to approach a given system in a synchronic way but in the case of Old Irish this is not always possible. We saw in Chapter Two that word-initial consonant mutations present in Old Irish cannot be viewed as phonological since their occurrence was not triggered by the synchronically available phonological environment. Old Irish vocalic alternations are also frequently unaccountable for if approached synchronically. Thus, a diachronic analysis of these alternations will be advocated.

An essential fact about Old Irish short vowels is that their actual quality is considered to be by and large dependent on the qualities of the flanking consonants. Moreover, consonants have to be taken into consideration while discussing the problem of short vocalic nuclei because no short vowel in a stressed syllable is allowed to occur word-finally in Old Irish, which means that a word like **cu* [ku] is a non-permissible construction. In such a case the vowel must be long, i.e. *cú* [ku:] – 'hound'. In order to capture the nature of the relationships between consonants and vowels and decide whether consonants determine the

vocalic expressions, we will discuss the quality specification of consonants paying particular attention to consonant-vowel interaction. Also in this respect a synchronic analysis of the problem may appear insufficient and a historical inspection of the data may turn out inevitable. In particular, it will be argued that the shape of Old Irish short vowels to a great extent reflects the prehistoric interactions of elements.

The present chapter is organized as follows. First, a selection of relevant data illustrating context-sensitive vowel alternations in Old Irish will be given. Additionally, prehistoric versions of words participating in alternating pairs will be provided with a view to identifying the reasons behind the raising and lowering of vowels in stressed syllables and accounting for these phenomena in terms of GP. Subsequently, traditional and modern approaches to the problem of consonant qualities in Old Irish will be presented and discussed. This will be followed by a discussion of the non-alternating vowels, the vowels in unstressed syllables and the context-sensitive long vowels. Finally, conclusions concerning vocalic alternations and consonant qualities in Old Irish will be drawn.

## 4.2. Vowels in stressed syllables and vocalic alternations

The first issue to be discussed here is the behaviour of simplex nuclei in stressed syllables. These vowels are graphically represented by *i*, *e*, *a*, *o*, *u*. It is generally assumed that the above symbols, if written single, represented the actual vocalic expressions. Sometimes, however, more than one vocalic symbol is employed to represent a vowel and in such cases additional factors have to be considered while deciding on the actual phonetic shape of this vowel. For example, in the word *leith* – 'half'-gen.sg. the symbol *e* gives the quality of the vowel, while the letter *i* indicates the palatalization of the final spirant. Thus, the word is pronounced as [L$^{i}$eθ$^{i}$], where the superscript symbol ( $^{i}$ ) denotes palatalization. The nominative singular of this word, which is [L$^{i}$eθ] *leth*, shows no palatalization of the final segment. In another example, namely *cinaid* – 'fault'-nom.pl., the vocalic symbol *a* is used to indicate that the word-medial nasal is non-palatalized although it occurs between two front vowels, and the word is pronounced as [k$^{i}$inið$^{i}$]. These orthographic factors, one of them being the need to indicate whether a given consonant is palatalized or not, will be mentioned whenever necessary. Palatalization and its functions in Old Irish will be discussed soon. First, let us concentrate on these short vowels in accented syllables which alternate with other ones.

Old Irish short vowels fall into four types according to the way they behave with respect to the phenomenon of alternation. Some short vowels in closed syllables alternate with those in the open syllables. We will call these 'alternating vowels in open syllables'. Consider the examples below:

| | | | | | |
|---|---|---|---|---|---|
| (1) | a. [u – o] | [guθ] | [goθo] | *guth*/*gotho* | – ‘voice’/gen.sg. |
| | | [oɣ] | [uɣe] | *og*/*ugae* | – ‘egg’/gen.sg. |
| | b. [i – e] | [fʲið] | [fʲeðo] | *fid*/*fedo* | – ‘wood’/gen.sg. |
| | | [gʲlʲeN] | [gʲlʲiNʲe] | *glenn*/*glinne* | – ‘valley’/gen.sg. |

We are dealing here with the most typical Old Irish alternations, that is [u – o] in (1a) and [i – e] in (1b). What seems responsible for the vocalic changes in these cases is the presence of the vowel in the genitive.

The same changes occur in another group of words. Here, however, the alternations occur without the presence of vocalic endings. These are shown below:

| | | | | | |
|---|---|---|---|---|---|
| (2) | a. [e – i] | [bʲeg] | [bʲigʲ] | *becc*/*bicc* | – ‘small’/gen.sg. |
| | | [fʲer] | [fʲirʲ] | *fer*/*fir* | – ‘man’/gen.sg. |
| | b. [o – u] | [kloθ] | [kluθ] | *cloth*/*cluth* | – ‘fame’/dat.sg. |
| | | [son] | [sun] | *son*/*sun* | – ‘sound’/dat.sg. |

Here the alternations cannot be accounted for by taking into consideration any vocalic environment because no endings are available. These vowels will be termed ‘alternating vowels in closed syllables’.

Another alternation taking place without the participation of vocalic endings is that of [a – u]. Words illustrating this alternation are slightly less numerous.

| | | | | | |
|---|---|---|---|---|---|
| (3) | [a – u] | [brat] | [brut] | *bratt*/*brutt* | – ‘cloak’/dat.sg. |
| | | [kraN] | [kruN] | *crann*/*crunn* | – ‘tree’/dat.sg. |

Yet another alternating type occurring in Old Irish is [a – e]. Similarly to the cases in (1), vocalic endings appear to have much in common with these changes too. Consider the examples below:

| | | | | | |
|---|---|---|---|---|---|
| (4) | [a – e] | [daɣʲ] | [dʲeɣo] | *daig*/*dego* | – ‘fire’/gen.sg. |
| | | [talʲmʲ] | [tʲelmo] | *tailm*/*telmo* | – ‘sling’/gen.sg. |

All these vocalic alternations in stressed syllables will be tackled in the ensuing sections. We will commence the survey with [i – e] and [u – o] changes in open syllables.

## 4.3. A GP analysis of vocalic alternations in stressed syllables

### *4.3.1. Vocalic alternations* [i – e] *and* [u – o] *in open syllables*

As mentioned in the previous section, some short vocalic expressions enter into alternations with other short vowels under clearly determined circumstances. Consider the following examples illustrating the most typical alternations occurring in Old Irish, which are [i – e] and [u – o] in open syllables:

(5) a. [i – e]

| | | | | |
|---|---|---|---|---|
| [m$^{i}$il$^{i}$] | [m$^{i}$elo] | [m$^{i}$il$^{i}$i] | *mil*/*melo*/*mili* | – ‘honey’/gen.sg./acc.pl.[1] |
| [R$^{i}$iNd] | [R$^{i}$eNdo] | [R$^{i}$eNde] | *rind*/*rendo*/*rendae* | – ‘star’/gen.sg./gen.pl. |
| [f$^{i}$is] | [f$^{i}$eso] | | *fi(u)s*/*feso* | – ‘knowledge’/gen.sg. |
| [b$^{i}$ig] | [b$^{i}$ega] | | *bi(u)cc*/*becca* | – ‘small’-gen.sg./nom.pl.nt. |

b. [u – o]

| | | | | |
|---|---|---|---|---|
| [muɣ] | moɣo] | [muɣu] | *mug*/*mogo*/*mugu* | – ‘serf’/gen.sg./acc.pl. |
| [kruχe] | [kroχ] | | *cruchae*/*croch* | – ‘cross’-gen.sg./nom.sg. |
| [mur$^{i}$] | [moro] | [mur$^{i}$e] | *muir*/*moro*/*muire* | – ‘sea’/gen.sg./nom.pl. |
| [trume] | [trom] | | *trummae*/*tromm* | – ‘heaviness’/‘heavy’ |

A certain regularity can be observed in many of the cases above. Specifically, the vowels [i] and [u] are present in the stressed syllables if there is no mid or low vowel in the following syllable, e.g. [moɣo] *mogo* vs. [muɣu] *mugu* – ‘serf’ -gen.sg./acc.pl. Seeing this, we may propose the following working hypothesis: high vowels go with other high vowels while non-high vowels accompany other non-high vowels. In other words, some kind of vowel harmony with respect to the height of the vowels can be detected.

However, there are a few problems with this observation. Above all, a few cases have no vocalic endings and the reasons why the stem vowel may be either mid or high are unclear. In particular, it is uncertain what determines the quality of the stem vowel if there is no ending. Another question refers to items such as [mur$^{i}$e] *muire* – ‘sea’-nom.pl. vs. [R$^{i}$eNde] *rendae* – ‘star’-gen.pl. In both these examples the final vowel is [e]. This vowel follows the high vowel in the stem in the former case, while it does not in the latter.

The fact that certain incongruities occur in a system may mean a few things. First, aberrations simply occur because there are no perfectly symmetrical systems. Second, the irregularities are superficial and the reason for them may still be undiscovered. Third, this reason may not be synchronic.

[1] The genitive frequently displays the ending *-a* instead of *-o*.

In point of fact, the Old Irish alternations exemplified in (5) above occurred in the prehistory of Irish and they had a clearly determined phonological cause (Thurneysen 1946:46ff.; Kortlandt 1979:43ff.; McCone 1996:110). Specifically, the presence of the vocalic ending frequently contributed to the quality of the stem vowel. When the ending contained a high vowel, the stem vowel was normally raised. If the ending consisted of a low vocalic segment, the stem vowel was most often lowered. Thus, the circumstances under which alternations occurred must not be neglected. Taking this into account, we need to go back in time to find out more about the contexts favouring vocalic changes.

*4.3.1.1. Historical causes of* [i – e] *and* [u – o] *alternations*

Although the examples in (5) illustrate most prominent alternations found in Old Irish, these changes have their source back in the prehistory of Irish. In particular, some original high vowels [i] and [u] were lowered to [e] and [o], respectively, when the following syllable contained a non-high back vowel, that is either [a] or [o] (Thurneysen 1946:46; McCone 1996:110ff.). This is illustrated below:

| (6) | ***Stage I*** | ***Stage II*** | ***Old Irish*** |
|---|---|---|---|
| i → e | *wis(s)oː | → *weso | → [f$^{i}$eso] *feso* – ‘knowledge’/gen.sg. |
| u → o | *trumba | → *tromba | → [trom] *tromm* – ‘heavy’ |

In both cases we can observe the lowering of the original high vowels in the stressed syllables to mid ones under the influence of non-high vowels in the following syllables at Stage II. However, a reverse process also took place in prehistory, as a result of which the original mid vowels [e] and [o] were raised to [i] and [u] if the following syllable included the high vowels [u] or [i].

| (7) | ***Stage I*** | ***Stage II*** | ***Old Irish*** |
|---|---|---|---|
| e → i | *melis | → *mili | → [m$^{i}$il$^{i}$] *mil*– ‘honey’ |
| o → u | *mori | → *muri | → [mur$^{i}$] *muir* – ‘sea’ |

The developments in (6) and (7) above show the phenomenon of vowel-harmony which was present in Primitive Irish. The effect of this process in the form of different shapes of the stressed stem vowels remained until Old Irish (and later on), even if the following vowels were dropped. In other words, the cause (the umlaut-triggering vowels) appeared in Stage I, the result of raising/lowering was observable at Stage II, while it remained put even if the trigger was no longer

present, which can be seen in Old Irish. Thus the absence of the vowel in the following syllable did not cause the retreat of the process, which in the case of, say, [mur$^{i}$] would produce the incorrect *[mor$^{i}$]. At his juncture we should reformulate our working hypothesis in the following way: if the word-final vowel is mid or low, the stem vowel should not be high.

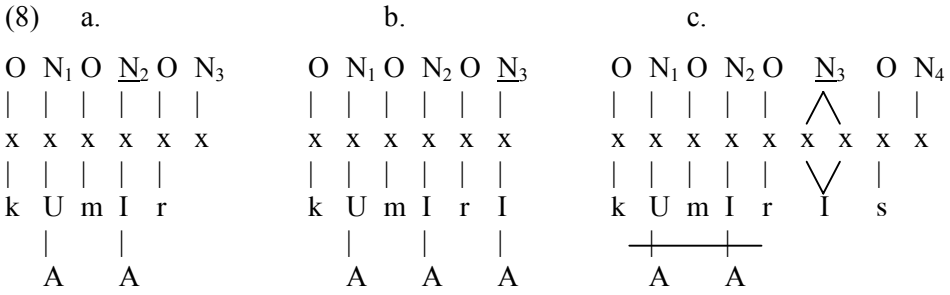
In the following section an attempt will be made to explain the prehistoric alternations in open syllables from the viewpoint of Government Phonology.

### *4.3.1.2. A GP account of* [i – e] *and* [u – o] *alternations*

Having identified the source of the vocalic alternations as the presence of the vowel of the ending, we may now try and account for these prehistoric changes in terms of interactions between phonological elements from the viewpoint of Government Phonology. Let us recall that GP recognizes three resonance elements responsible for the shape of all vocalic expressions, namely (I), (A), and (U). It is commonly held that these elements, when used in isolation, represent the vowels [i], [a] and [u], respectively. They can also combine with others, e.g. (I, A) stands for [e] while (U, A) represents [o]. Since we have not discovered any other vowels apart from the canonical five in either Primitive Irish or Old Irish as yet, we may adhere to this standard interpretation of vocalic structure.

Before a GP analysis of the pre-Old Irish vocalic alternations is offered, let us consider instances of vowel harmony in Pasiego Spanish (Harris and Lindsey 1995:42ff.) with a view to discovering if these cases resemble the vocalic phenomena in the ancient Irish words. Pasiego Spanish displays the height harmony. In other words, high vowels cannot occur with mid or low vowels in one word. The responsibility for the height of vowels in lexical items is not accidentally granted: the underlined licensing nucleus (the stress-bearing head of the domain) determines the melodic content of the unstressed nuclei. This is shown below:

(8)

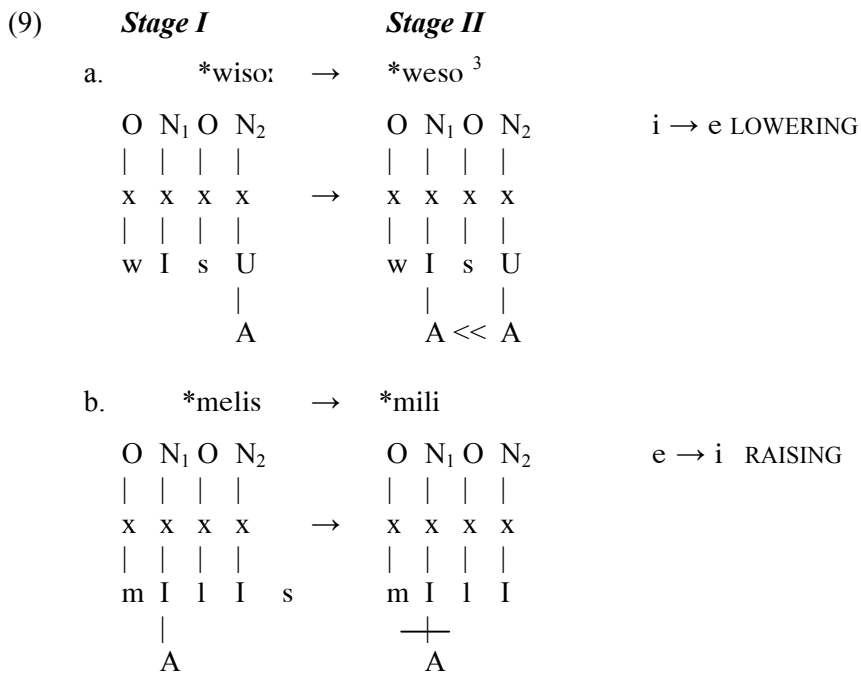



[komer] – ‘eat’ (inf.) [komere] – (1sg.fut.) [kumiri:s] – (2pl.fut.)

In (8a) the head of the domain ($N_2$) contains the element (A) which is also licensed by the other nucleus in the domain, that is ($N_1$). As a result, we find only mid vowels in this word. In (8b) the main licenser ($N_3$) also possesses the prime (A) and this element appears in the remaining nuclei. This fact is responsible for the presence of only mid vowels in this item. In (8c), though, the licenser ($N_3$) displays only the element (I) which is realized as the high vowel [iː] and the licensees also disfavour the element (A).[2] This results in the suppression of (A), the unstressed vowels are high as well and they surface as [u] and [i].

Let us now return to the pre-Old Irish changes [i – e] and [u – o]. Similarly to the vocalic alternations in Pasiego Spanish, we are dealing here with height vowel harmony as well. The archaic versions of *feso* – 'knowledge'-gen.sg. and *mil* – 'honey' serve as examples. Consider the following developments, where the vowels are represented by the appropriate phonological primes (certain segments are left unsyllabified for the sake of clarity):

(9)




[2] In the representation in (8c) we disregard the fact that the stressed long vowel is viewed by Harris and Lindsey as a branching nucleus and not as a sequence of two nuclei. Their different interpretation of the skeletal structure of long vowels has no impact on the present discussion.

[3] See section (2.3.4.) to find out about the development of [w] to [f].

These representations are roughly parallel to those illustrating the alternations in Pasiego Spanish above. Stage I shows the state of affairs before the alternation. In Stage II in (9a) the nucleus ($N_1$) licenses the element (A) because this prime has been attached also to the nucleus ($N_2$). The element spreading from ($N_2$) for ($N_1$) is marked by (<<) because the element (A) 'moves' from the end of the word to the left. As a result, two mid vowels occur in the word *weso.

The fact that the element (A) is now present in two consecutive nuclei may be understood in terms of spreading. What is peculiar and different from the situation in Pasiego Spanish is that the nucleus from which the element spreads is not the stressed head of the domain, as we would expect. However, the notion of spreading, as discussed by Harris (1994:167), need not be viewed as a dynamic phenomenon. In other words, a skeletal position may be phonetically interpreted as one which contains a prime which is distinctively lodged under another position. Thus, the original [i] under ($N_1$) may have been interpreted as [e] before a back non-high vowel in the following syllable. In other words, we may be witnessing an interpretative (phonetic) effect which was later lexicalized.

In Stage II of (9b) the original vowel [e] in ($N_1$) no longer licenses the element (A) because this prime is absent from the nucleus ($N_2$). Deprived of (A), the vowels are high and the form surfaces as *mili. This element decomposition can hardly be treated as a phonetic effect, though. It is clear that when the vowel of the ending lacks (A), the stem vowel does not license it either. Thus, we must conclude that we are dealing with umlaut (regressive vowel harmony).

Since the phenomenon of vowel harmony occurs at the melodic level, it is likely that at some point in prehistory the high vowels were lowered while the mid ones were raised due to the same melodic constraint: the element (A) had to be doubly linked to survive in the structure. To put it differently, once this element was linked to the final vowel, it had to be licensed by the stem vowel as well. If this prime was absent from the ending, it was automatically suppressed under the other nucleus in the harmonic span.

The reason why it is the ending and not the stem vowel that determines the quality of the harmonic span is not clear and, under the above analysis, unimportant. Note that umlaut which took place in, for example, Old Icelandic (e.g. Anderson and Ewen 1987:215ff.) and other languages is also frequently difficult to account for. What is clear is that the phonological context for these pre-Old Irish changes was present and the local source for element spreading was identifiable.

The diagrams in (9a, b) suggest why the alternation of [i – e] occurred in Primitive Irish. Exactly the same conditions had to be met in the [u – o] alternation. As a matter of fact, some of these alternations retain the phonological context in Old Irish, e.g. [f$^{i}$eso] *feso* – 'knowledge'-gen.sg. vs. [muɣu] *mugu* – 'serf'-acc. pl. etc., because the final vowels have not been dropped.

What still calls for explanation is the different behaviour of the stem vowels before the mid vowel [e], which is exemplified by [mur$^{i}$e] *muire* – 'sea'-nom.pl. vs. [R$^{i}$eNde] *rendae* – 'star'-gen.pl. Let us recall that the constraint proposed for vowel harmony is that the element (A) must be doubly linked. Looking at these Old Irish forms alone does not help to answer the question of why the word [R$^{i}$eNde] fulfils this condition, while [mur$^{i}$e] does not. At first sight, one might suspect that the palatalization factor has something to do with this incongruity. In particular, the cluster [Nd] in [R$^{i}$eNde] is broad (that is, it does not favour height), while the liquid [r] in [mur$^{i}$e] is slender (which may support height). However, if we also consider cases such as [trume] *trummae* – 'heaviness', where the nasal [m] is broad and the form should behave like [R$^{i}$eNde], but it does not, it is clear that the palatalization factor is not at work here. Thus, we need to consult the prehistoric variants once again and see if any clues can be found in the relevant literature.

Let us begin with [mur$^{i}$e] *muire* – 'sea'-nom.pl. We remember from (6) and (7) above that the original stem vowel in the word for 'sea' was [o], e.g. in the prehistoric nominative singular *mori. Thurneysen (1946:193) notes that the nominative plural ending *-e* in the declension to which [mur$^{i}$e] belongs (the so-called *i*-stems) goes back to *-ia. Pokorny (1914:62) transcribes this primitive ending as *-ijə. Whatever the phonetic interpretation and syllabic structure of this ending was, that is, either a diphthong (two nuclei with an intervening empty onset) or two vowels separated by a semi-vowel (nucleus-onset-nucleus), one thing seems obvious: there was a high vowel immediately following the stem and the stem vowel could not possibly be mid in this particular paradigmatic case. The development of the nominative plural must have been *morijə → *murijə → [mur$^{i}$e]. In terms of elements, we can conclude that, when the raising occurred, there was no element (A) under the nucleus immediately following the liquid [r] and, consequently, this element could not survive in the left-hand nucleus.

If we now turn to the form [R$^{i}$eNde] *rendae* – 'star'-gen.pl., we find the following descriptions. Both Thurneysen (1946:198) and Pokorny (1914:64) agree that the genitive plural ending *-e* is not typical of the declension to which this word belongs (the so-called *u*-stems) and that it was borrowed from the declension under which [mur$^{i}$e] is classified (in fact, the nominative and genitive plural in the case of [mur$^{i}$e] are identical in Old Irish). Pokorny additionally observes that the genitive plural primitive ending in *u*-stems was *-o, which originated from the earlier *-owom. Thus, we are faced with the following state of affairs.

The original stem vowel in the word for 'star' was [e], the ancient nominative being *rendu. This vowel was raised to [i] in the nominative [R$^{i}$iNd] *rind* according to our constraint on the double linking of (A), i.e. *rendu → *riNdu → [R$^{i}$iNd]. The genitive singular [R$^{i}$eNdo] *rendo* is perfectly regular: the original

[e] in the stressed syllable is simply preserved since the following vowel contains the prime (A), that is *rendo: → *reNdo → [R$^{i}$eNdo]. Consequently, the development of genitive plural [R$^{i}$eNde] *rendae* must have been *rendowom → *reNdo. The conditions mentioned above are met here as well because the mid vowel remains intact if followed by another mid vowel. Afterwards, as Pokorny and Thurneysen suggest, the replacement of the original ending took place and the final *-e* was substituted for the original regular final *-o*. This substitution had nothing to do with phonological development and the vocalic ending, which was attached to the consonant-final stem, apparently exerted no influence on the stem vowel. We cannot be absolutely certain about the lack of impact of this ending because both [o] and [e] contain the element (A). Thus, either vowel was theoretically capable of supporting the element (A) in the stem vowel. However, the fact that the new palatalizing ending *-e* did not transform the stem-final cluster into a palatalized sequence of consonants may indicate that *-e* was added to the stem when the vowel harmony, which triggered the alternations, was no longer in force. To conclude, the ending [e] in [R$^{i}$eNde] *rendae* – 'star'-gen.pl. is not a result of a phonological development, while the stem vowel was not raised to [i] because it was followed by [o] when vowel harmony was operative.

A word or two should now be said about the form [trume] *trummae* – 'heaviness', which has been used as a counterexample to the possible claim that the quality of the consonant preceding the ending may have had some impact on the stem vowel. This word belongs to the so-called *iá*-stems, and the primitive palatalizing ending *-ija (Thurneysen 1946:165) indicates that, at the time of alternations, the stem *trumb was followed by a high vowel, which did not cause the lowering of the original high vowel [u] to [o]. Afterwards, the ending was simplified to the palatalizing [e], but the stem-final cluster resisted palatalization, which may result from the inherent properties of this cluster (Thurneysen 1946: 103). Thus, the preservation of [u] in the stem was regular and the fact that this vowel was later followed by the ending [e] is irrelevant.

To sum up the analysis of ancient element interactions which caused the vocalic alternations [i – e] and [u – o], it needs to be said that the processes of raising and lowering were perfectly regular and predictable in prehistory. Since all words contained stressed vowels which were followed by other vocalic segments in recessive syllables, we may safely speak of vowel harmony with respect to height. In GP terms, the occurrence of the element (A) in the vocalic ending, i.e. in either [o] or [a], triggered the presence of the same prime in the stem vowel, while the absence of (A) in the final vocalic expression invariably resulted in the raising of the whole harmonic span. The subsequent (Early) Old Irish ending shifts and confusions between different declensions frequently obscured the true cause of the abovementioned alternations.

Since the prehistoric regular vocalic alternations still take place in Old Irish without a visible cause, we may tentatively call them morphophonological. In other words, the ancient phonological pattern (alternation) is preserved although the trigger (vocalic ending) is frequently no longer available.

In the following section we will inspect another stressed-vowel alternation, namely [a – e], which seems to be triggered by the synchronic presence of the vowel in the final syllable. Also in this analysis we will need to resort to prehistoric forms of lexical items to find out whether any regularities can be detected.

### *4.3.2. Vocalic alternation* [a – e]

Let us now turn to [a – e], another alternation occurring in stressed syllables, Although it affected a relatively small number of lexical items, this alternation is fairly regular and must be treated on a par with the ones discussed above.

One major difference between the alternations analyzed in the previous sections and this one is as follows. In the case of both changes [i – e] and [u – o], the presence of the vowel in the final syllable in Old Irish caused the lowering (e.g. *fis*/*feso* – 'knowledge'/gen.sg.) while its absence triggered the raising (e.g. *mil*/*melo* – 'honey'/gen.sg.) of the original stressed nucleus. On the other hand, in the alternation of [a – e], the synchronically available ending invariably raises the stem vowel. Consider the following examples illustrating this pattern.

| (10) | [a – e] | | |
|---|---|---|---|
| [aɣ$^{i}$] | [eɣo] | *aig*/*ego* | – 'ice'/gen.sg.[4] |
| [daɣ$^{i}$] | [d$^{i}$eɣo] | *daig*/*dego* | – 'flame'/gen.sg. |
| [fraɣ$^{i}$] | [fr$^{i}$eɣo] | *fraig*/*frego* | – 'wall'/gen.sg. |
| [talm$^{i}$] | [t$^{i}$elmo] | *tailm*/*telmo* | – 'sling'/gen.sg. |

The alternation exemplified above appears regular in that the stem vowel [a] of the nominative is always raised to [e] if the following genitive ending contains the vowel [o]. The cases from (5) above, e.g. [f$^{i}$is]/[f$^{i}$eso] *fi(u)s*/*feso* – 'knowledge'/gen.sg., may indicate that we are dealing with the same height harmony in the genitive, but the low vowel [a] in the nominative remains unaccounted for. In other words, we would expect the vowel [i] in this context.

We remember from (4.3.1.2.) that the presence of the element (A) in the final syllable can be held responsible for the preservation of the mid vowel [e] in the stressed syllable, e.g. *rendo → [R$^{i}$eNdo] *rendo* – 'star'-gen.sg., and for the change of [i] to [e], e.g. *wisso: → *weso → [f$^{i}$eso] *feso* – 'knowledge'-gen.sg.

[4] Similarly to words such as *feso* and *moro*, the genitive singular of these items also frequently displays the final -*a* instead of -*o* in Old Irish.

However, so far the vowel alternating with [e] has been [i] and not [a]. What should also be noted about the cases in (10) is that the final consonant of the nominative is always palatalized, while the consonant preceding the final vowel of the genitive is not. Moreover, palatalization is present in the initial consonant of the genitive only, which tallies with the view that only the front vowels, i.e. [i] and [e], can follow a slender consonant.

Before we inspect the prehistoric versionsof the relevant examples, we may hypothesize about the nature of this alternation using GP terminology. We know that in terms of elements the vowel [a] is a realization of the prime (A), the vowel [e] is normally a mixture of (I, A), while [o] is a combination of (U, A). Looking at the data in (10) we are confronted with the following situation. The left-hand nucleus contains the element (A) alone in the nominative. This prime, when apparently influenced by the combination of (A, U) in the genitive, produces the blend of (I, A). Such a process is definitely out of the question because it has no local source and we need to find a far more plausible solution.

One logical possibility is that the nominative and the genitive originate from different stems and are, in fact, phonologically distant from each other. Another option may be that there is a mechanism which has not yet been discovered, for example the merger of the nuclear (A) with the element (I), possibly somehow defining the final palatalized consonant of the nominative, in order to satisfy the vowel harmony requirements of the genitive case, i.e. those present in [fʲeso] – 'knowledge'-gen.sg., for instance. Finally, in prehistory something may have happened which caused the discrepancy between the stem vowel in these two paradigmatic cases. In pursuit of the reasons behind this change, let us go back in time again and inspect the situation in the ancient version of Irish.

#### *4.3.2.1 Historical causes of the alternation* [a – e]

First, let us analyze the descriptions of the alternation [a – e] in the relevant literature. Thurneysen (1946:53ff.) remarks that the original [e] was often replaced by [a] before palatalized consonants, the reason being "to differentiate *e* more sharply from the following palatal sound". Before broad consonants the fluctuation between *a* and *e* originated due to analogy with other lexical items. Pokorny (1914:47) describes the conditions under which the original *e* was replaced as not quite clear. McCone (1996:111, 118) offers the following derivations of both the paradigmatic cases of the pair [daɣʲ]/[dʲeɣo] *daig/dego* – 'flame'/gen.sg.:

(11) a. *deɣʷʲih → *dæɣʷi → [daɣʲ]

b. *deɣʷoːh → *dʲeɣʷoː → [dʲeɣo]

He argues that the stressed [e] was lowered to [æ] before the velar fricative [ɣ] and the front vowel [i] or [e] in the following syllable (11a). He also adds that this change was chronologically prior to the expected raising of [e] before high vowels in the following syllables, e.g. *melis → *mili → [mʲilʲ] *mil* – 'honey', which was shown in (7) above. If the chronology had been different, the nominative would have displayed the vowel [i], and surfaced as *[dʲiɣʲ], which was not the case. Subsequently, the ancient [æ] was retracted to [a] and, as a result, in Old Irish we witness the spurious alternation of [a – e]. The case of *tailm*, which does not contain the final [ɣ], must be a form coined by analogy.

By all means (chrono)logical and plausible, this interpretation reveals that the exchange of [a – e] differs from the changes discussed in the previous sections. This one is simply not phonological in either synchronic or diachronic terms. Thus, a GP analysis is redundant here since [dʲeɣo] *dego* – 'flame'-gen.sg. behaves exactly in the same way as *rendo → [RʲeNdo] *rendo* – 'star'-gen.sg. in that the original vowel [e] is not raised to [i] because of the vowel [o] in the final syllable, whereas the original [e] of [daɣʲ] *daig* – 'flame' is lowered for reasons which cannot be named phonological *sensu stricto*.

The fact that this lowering was not phonologically motivated does not mean that this process itself cannot be accounted for phonologically. In terms of elements, the original combination (A, I) has been assumed to represent [e]. When this segment underwent lowering, its structure did not change considerably. In GP differences between segments having identical element structures is normally rendered by using the concept of headedness, which is connected with asymmetric relations between the primes involved. Therefore, the original [e] of the nominative *deɣʷih possibly contained the element (I) as the head,[5] so it was actually (A, I). The lowering of [e] to [æ] must have resulted in the shift of status between these two elements, that is, the other element acquired headship and the blend was (A, I). Later on, this group was broken up, the prime (A) alone remained and surfaced as [a] in Old Irish.[6] Whether or not this [a] was a headed vowel in the Old Irish period cannot be answered at this stage.

What needs to be explained is the reason why the lowering of the original [e] took place. Although the result is unexpected, i.e. we witness the lowering of the original [e] to [a] instead of its raising to [i], Thurneysen as well as McCone imply that the palatalized quality of the following consonant played an important

[5] See Harris (1994:105-126) for more details concerning the role and status of phonological primes in GP.

[6] Since vowel harmony was no longer operative in Old Irish, perhaps the stem vowel [a] did not need any support from the recessive nuclei to remain unchanged. We will return to the structure of [a] below.

part in this process. Therefore, in the following section we will take a closer look at the issue of palatalization in the prehistory of Irish.

### *4.3.2.2. Palatalization in the prehistory of Irish*

One of the most prominent features of the Irish language, both past and present, is the phenomenon of palatalization of consonants.[7] Palatalization occurs in many world languages as a phonetic effect, e.g. the English [k] in the word [kiːn] *keen* is palatalized due to the presence of the following front high vowel, while it is not in the word [kʌm] *come*. In other tongues, such as Polish, it may play a distinctive role, e.g. [mʲetʃ] ***mi****ecz* vs. [metʃ] ***m****ecz* – 'sword'/'match' (palatalized vs. neutral initial [m]). In Modern Irish consonants may be palatalized lexically, e.g. [kʲuːʃ] ***ci****umhais* vs. [kuːʃ] ***c****úis* – 'edge'/ 'reason' in Munster Irish (Cyran 1997:29). Palatalization may also have a grammatical function of determining, for example, paradigmatic cases of nouns, e.g. [gasuːr] *gasú****r*** vs. [gasuːrʲ] *gasú****ir*** – 'child'/gen.sg. (Ó Siadhail 1989:135).

In Old Irish the situation was slightly different in that the palatalization of word-initial consonants was accompanied by the physical phonetic presence of a front vowel. Thus, initial consonants followed by the front *i* or *e*, both long and short, were automatically palatalized and it was unlikely for a word-initial slender consonant to precede a non-front vowel, e.g. words such as the Munster Irish [bʲaləχ] *bealach* – 'way' were impossible.[8] The reverse situation, that is, a front vowel following a broad consonant was also unfeasible. In other words, there was a strict correlation between the palatalization of the initial consonant and the quality of the following vowel. In other positions palatalization was an exponent of case, gender, number, tense, etc., e.g. [bʲerʲiðʲ] *be(i)rid* vs. [bʲeriðʲ] *ber(a)id* – 'carry'-3sg./subjunctive (the only difference between these two forms is the palatalized vs. non-palatalized liquid [r]).

Palatalization as a property of Irish consonants began to play a distinguishing role in the period when vocalic endings were lost (apocope) and word-medial vowel deletion (syncope) resulted in vowel-zero alternations and the emergence of new consonant clusters. McCone (1994:80ff.; 1996:115ff., 125, 136ff.) draws a dividing line between palatalization as a phonetic effect and palatalization as a privative property of consonants which plays a grammatical function roughly in Early Old Irish. Before that period, that is in Primitive Irish, palatalization was sometimes phonologically distinctive, while in other instances it was still basi-

[7] The issue of palatalization versus other consonant qualities in Old Irish will be dealt with in later parts of this chapter.

[8] The occasional non-palatalization of the word-initial [R] was apparently exceptional, e.g. [Riː] *rí* – 'king'.

cally a property provided to consonants by the following front vowels [i] and [e], both long and short. Greene (1973) remarks that palatalization was a gradual process, which explains why it became distinctive in different words and word-forms in different periods of time.

Thus, returning to our problem with the development of *deɣ$^{w}$ih → *dæɣ$^{w}$i → [daɣ$^{i}$] *daig* – 'flame', in Primitive Irish the initial [d] in both the nominative *deɣ$^{w}$ih and the genitive *deɣ$^{w}$oːh was still non-palatalized in the distinctive sense, although the front vowel [e] clearly had a palatalizing effect on it. This situation changed when the typically palatalizing vowels, that is *i* and *e*, began to exert dissimilar influence on the preceding consonants in unstressed syllables. For example, the vowel [e] in *taveri did not palatalize the preceding consonant [v], as a result of which the Old Irish version [tavərʲ] *:tabair* – '(he)gives'-prot., displays a non-palatalized [v]. On the other hand, the vowel [i] in *tavirod, even if it was subsequently lost, did provide the preceding [v] with a palatalized property, and in the Old Irish [tavʲrʲəd] *:taibret* – '(they)give' this fricative is slender (the palatalization of [r] was a later change). Although this is a very simplified picture of the origins of palatalization, it shows that the previous phonetic effects were transformed into privative properties of non-initial consonants.

In McCone's (1994, 1996) account, which is a summary of all major works on this issue (chiefly Greene 1973), there were several phases of palatalization happening between Primitive and Middle Irish. The reason for dividing palatalization into stages is connected with the fact that certain phonological developments took place after while others before some consonantal segments acquired the palatalized property. Otherwise, no (chrono)logical order would be possible to establish. For our purposes, which involve the explanation of the unexpected lowering of the vowel [e] before a front vowel of the ending, i.e. *deɣ$^{w}$ih → *dæɣ$^{w}$i → [daɣ$^{i}$] *daig* – 'flame', the first two stages, both taking place in Primitive Irish, will suffice since we are dealing with the pre-Old Irish period.

Roughly speaking, then, the first palatalization stage affected non-initial consonants or clusters between front vowels or before short or long *i*. The second wave palatalized the initial consonants followed by the front vowels [i] or [e] (long or short).[9]

Without going into the details of palatalization any further, we may state that in the word *deɣ$^{w}$ih → *dæɣ$^{wi}$ih → *daɣ$^{wi}$i → [daɣ$^{i}$] the lowering of the stem vowel [e] → [æ] happened more or less at the time of the first palatalization (or just before it), while the subsequent retraction to [a] occurred between the first and the second wave of palatalization. This is what transpires from McCone's

[9] In fact, it is difficult to understand why this should be treated as a distinctive property since all word-initial consonants followed by either *i* or *e* were palatalized anyway.

(1994, 1996) chronology. If the order of events had been different, the left-hand original front vowel [e] would have palatalized the initial dental [d], which was not the case, unlike in the genitive, e.g. *deɣ$^{w}$oːh → *d$^{i}$eɣ$^{w}$oː → [d$^{i}$eɣo]. After that, apocope (loss of final vowel) came about and the velar [ɣ$^{wi}$], which had been palatalized by the following vowel, retained the property even though this vowel was lost. Later on it also lost the labial component [$^{w}$] and surfaced as the plain (non-labialized) [ɣ$^{i}$] in Old Irish.

Taking into account the view that palatalization was an active process resulting from a loss of previous (phonetic) distinctions between palatalizing and non-palatalizing vowels, we may suspect that the lowering of the original [e] to [æ] in *deɣ$^{w}$ih → *dæɣ$^{wi}$ih had something to do with the system-internal need to distinguish between palatalizing and non-palatalizing vowels. As already suggested, the element structure (A, I) may have been reinterpreted as (A, I). Afterwards, when [æ] was lowered to [a] in *dæɣ$^{w\ i}$ih → *daɣ$^{wi}$i, we can hypothesize that the structure (A, I) decomposed into (A), while the element (I) either was deleted altogether or joined the following slender consonant. No other solution appears available at this stage.

In the ensuing sections we will inspect Old Irish vocalic alternations which took place without synchronically present vocalic endings.

### *4.3.3. Vocalic alternations* [i – e] *and* [u – o] *in closed syllables*

Now we turn to the Old Irish alternations of [i – e] and [u – o] in so-called closed syllables. Unlike cases such as, for example, [moɣo] *mogo* vs. [muɣu] *mugu* – 'serf'-gen.sg./acc.pl. in (5) above, these vocalic changes occurred in Old Irish without the synchronic presence of final vowels. Apart from the vocalic alternations in the data in (12), we should pay attention to the distinction between palatalized and non-palatalized final consonants. The phonetic transcription adopted here is based upon Thurneysen (1946:57), so the sequence of *iu* stands for [i], while *ui* represents [u] in the following examples:[10]

| (12) | NOMINATIVE SG. | GENITIVE SG. | DATIVE SG. | |
|---|---|---|---|---|
| a. [i – e] | | | | |
| | [f$^{i}$er] *fer* | [f$^{i}$ir$^{i}$] *fir* | [f$^{i}$ir] *fiur* | – 'man' |
| | [k$^{i}$eN] *cenn* | [k$^{i}$iN$^{i}$] *cinn* | [k$^{i}$iN] *ciunn* | – 'head' |
| | [b$^{i}$eg] *becc* | [b$^{i}$ig$^{i}$] *bicc* | [b$^{i}$ig] *biucc* | – 'small' |
| | [s$^{i}$en] *sen* | [s$^{i}$in$^{i}$] *sin* | [s$^{i}$in] *siun* | – 'old' |

[10] In fact, Thurneysen (1946) postulates that the orthographic sequence *iu* should indicate the rounded quality (u) of the following consonant, e.g. [f$^{i}$ir$^{u}$] *fiur* – 'man'. For details see (4.3.4.1.).

| | NOMINATIVE SG. | GENITIVE SG. | DATIVE SG. | |
|---|---|---|---|---|
| b. [u – o] | | | | |
| | [son] *son* | [sun$^{i}$] *suin* | [sun] *sun* | – ‘sound’ |
| | [kloθ] *cloth* | [kluθ$^{i}$] *cluith* | [kluθ] *cluth* | – ‘fame’ |
| | [kol] *col* | [kul$^{i}$] *cuil* | [kul] *cul* | – ‘sin’ |
| | [moð] *mod* | [muð$^{i}$] *muid* | [muð] *mud* | – ‘mode’ |

In (12a) the nominative displays the mid vowel [e] and the final consonant is non-palatalized. In the genitive the vowel is the high [i] and the final consonant shows palatalization. In the dative the vowel is [i], like the one in the genitive, but the final consonant is non-palatalized, similarly to that in the nominative.

A similar pattern occurs in (12b). Before the broad final consonant we can observe the mid vowel [o]. In the genitive the high vowel [u] surfaces in front of the slender consonant. The dative, in turn, contains [u], like the genitive, but the final consonant is broad, like the one in the nominative.

As already said, these alternations bear resemblance to those in the so-called open syllables presented in (5). The only difference is that no ending can be held synchronically responsible for these vocalic changes. While discussing the vocalic changes in open syllables we found out that the synchronic Old Irish versions of words were not particularly useful in determining the phonological cause of the alternations. In the case of examples from (12), a diachronic inspection of word forms can turn out even more helpful.

#### *4.3.3.1. Historical causes of* [i – e] *and* [u – o] *alternations*

We will now take a look at the prehistoric developments of the words in (12). First, consider the following cases illustrating the alternation of [i – e]:

(13) [i – e]

| | | | | |
|---|---|---|---|---|
| a. *wirah | → *wera | → [f$^{i}$er] | *fer* | NOMINATIVE SG. |
| b. *wiriː | → *wiri | → [f$^{i}$ir$^{i}$] | *fir* | GENITIVE SG. |
| c. *wiruː | → *wiru | → [fir] | *fiur* | DATIVE SG. |

In (13) the developments of the ancient forms of the three paradigmatic cases of the word for ‘man’ are presented. In all the cases the original vowel [i] behaved according to the principles of vowel harmony established for the alternation of [i – e] in open syllables. There is nothing surprising about this fact because it is clear that in prehistory these forms were parallel to those in (6), e.g. *wissoː → *weso → [f$^{i}$eso] *feso*. The only difference is that in the cases in (13) their Old Irish versions have lost the vocalic endings. So, in the nominative the original

high vowel [i] was lowered to [e] before a non-high vowel in the following syllable. In both the genitive and dative this high vowel was preserved because the vowels in the following syllable were also high. Therefore, we can state that the behaviour of these ancient forms confirms our constraint on the double linking of (A). What is interesting is that when the final vowels were dropped, the stem vowels retained the height they had acquired in the prehistoric process of vowel harmony. Since the prehistoric pattern of alternation was preserved even though the trigger was no longer present in the cases in (13), we can say that the alternation [i – e] was morphophonological in Old Irish.

Now let us consider the developments of word-forms in which the original stem vowel was not [i] but [e].

(14)

| | | | | | |
|---|---|---|---|---|---|
| a. | *senah | → *sena | → [s$^{i}$en] | *sen* | NOMINATIVE SG. |
| b. | *seniː | → *sini | → [s$^{i}$in$^{i}$] | *sin* | GENITIVE SG. |
| c. | *senuː | → *sinu | → [s$^{i}$in] | *siun* | DATIVE SG. |

In the word for ‘old’ the original vowel [e] behaved according to the same principle in that the mid vowel was preserved in the nominative because the following vowel was not high, while it was raised to [i] before the high vowels in the genitive and dative endings.

Let us now turn to the other alternation, that is [u – o], so as to see if the ancient variants of the word for ‘fame’ will shed more light on our analysis.

(15) [u – o]

| | | | | | |
|---|---|---|---|---|---|
| a. | *kluθah | → *kloθa | → [kloθ] | *cloth* | NOMINATIVE SG. |
| b. | *kluθiː | → *kluθi | → [kluθ$^{i}$] | *cluith* | GENITIVE SG. |
| c. | *kluθuː | → *kluθu | → [kluθ] | *cluth* | DATIVE SG. |

What can be observed in (15) is that the original stem vowel [u] behaves exactly as we have predicted: [u] is lowered to [o] before the low vowel in the nominative, while it remains intact in the other two cases due to the fact that they contain vocalic endings in the shape of high vowels.

Thus, these prehistoric developments show that the principle of vowel harmony was omnipresent in ancient times and the fact that in Old Irish some forms still display vocalic endings, while others do not, has no bearing on the shape of the stem vowels. These were shaped in Primitive Irish and remained unchanged after apocope (final vowel loss).

We can conclude that the ancient vowel harmony effects were still present in Old Irish, although the trigger, i.e. the vocalic ending, was no longer available.

Thus, we are dealing with a morphophonological phenomenon again. Since the vowel harmony observed here is exactly the same as that in (6) and (7) above, a GP analysis of the influence of the element (A) in the vocalic ending upon the preceding nucleus will not be repeated here. Instead, we will concentrate on the issue of consonant qualities in Old Irish and the different interpretations of the vocalic alternations discussed above.

#### *4.3.3.2. Different interpretations of* [i – e] *and* [u – o] *alternations*

It was indicated above (12) that the method of transcription adopted in describing the alternation of [i – e] was by and large based on Thurneysen (1946). The shape of short vowels in monosyllabic words in (12a, b) is not unequivocally interpreted, however, and the vocalic alternations may look different if another method is employed. Thurneysen's (1946) approach, although phonemic in nature, allows us to state that the Old Irish changes of [i – e] and [u – o] were morphophonological. McCone's (1996) interpretation of this particular alternation, although also phonemic, is at odds with that advocated by Thurneysen. McCone treats the vowels [i] of the dative as the short diphthongs [iu], e.g. [f$^{i}$iur] *fiur* – 'man', [k$^{i}$iuN] *ciunn* – 'head', and he does it for one basic reason: he has a different view of the shape and number of consonant qualities in Old Irish.

Roughly, Thurneysen (1946) interprets the contrast between the genitive, e.g. [f$^{i}$ir$^{i}$] *fir* – 'man' and the dative, e.g. [f$^{i}$ir] *fiur* – 'man', in terms of different qualities of the final consonant, which is palatalized in [f$^{i}$ir$^{i}$] but rounded in [f$^{i}$ir$^{u}$]. On the other hand, McCone (1996) argues that there was no such thing as the rounded quality in Old Irish and the presence of the orthographic *u* in the dative indicates the occurrence of the short diphthong in forms like [f$^{i}$iur] *fiur*. Thus, the genitive is differentiated from the dative not only by the palatalization vs. non-palatalization of the final consonant, but also by the difference in the vocalic expression. Although these approaches are dissimilar, both the authors aim to prove that there were synchronic markers of phonemic contrast between different words or paradigmatic cases of the same lexical items in Old Irish. In the following sections we will take a closer look at the views on consonant qualities in Old Irish and the consequences of taking different positions in this respect.

### *4.3.4. Quality of Consonants*

#### *4.3.4.1. Traditional views on Old Irish consonant qualities*

It is usually assumed that Old Irish consonants can be either palatalized or non-palatalized. We described the first developments of palatalization in Primitive Irish in (4.3.2.2.) above. For some scholars Old Irish consonants can have at

least two or at most three different qualities. The traditional view, represented by Pokorny (1914:13), Thurneysen (1946:96ff.), Lehmann and Lehmann (1975:8) and many others, is that the consonants in this system have three qualities:

(16) *i-quality* – palatalized or slender
*u-quality* – rounded (or labialised or velarized?)
*a-quality* – neutral or broad

The palatalized consonants are pronounced with the tongue "tending towards the position for the vowel [i]" (Quin 1975:5), that is, the tongue is close to the palate. These consonants occur normally before front vowels, e.g. the stop [g] in the word [g$^{i}$in] *gin* – 'mouth'. In *u*-quality consonants, an off-glide resembling the vowel [u] can be heard after the consonant, and the rounding of lips can be expected (Thurneysen 1946:97). Actually, while describing *u*-quality the term 'rounded' is most frequently used, whereas the notion of 'velarization' is viewed as not particularly fortunate. This is so because, as distinct from Modern Irish which displays the two-way opposition between palatalized (*i*-quality) and velarized (*u*-quality) consonants, there is no evidence that the Old Irish *u*-quality consonants showed any signs of velarization comparable to that in the modern system. Thurneysen (1946:97) as well as Lewis and Pedersen (1974:96) state straightforwardly that the Old Irish *u*-quality and the Modern Irish velarization have not much in common. What is commonly held is that Old Irish consonants were simply rounded before a non-low back vowel, e.g. the spirant [s] in [s$^{u}$on] *son* – 'sound'. Finally, neutral consonants show neither roundness nor palatalization. These consonants are followed by the vowel [a], e.g. [m$^{a}$ak] *macc* – 'son'.

In phonetic terms, this division appears perfectly justifiable with respect to *i*-quality and *u*-quality. However, as far as the neutral quality is concerned, one may wonder why neutrality should be defined by a low vowel symbol. Thurneysen (1946:97) observes that "neutral quality may be regarded as the normal quality; consonants which are uninfluenced by any vowel are neutral". Before we cope with this question, let us realize that such a division is not popular with many other analysts of Irish.

Greene (1956) and McCone (1996) among others, find this threefold division untenable for typological and practical reasons (see 4.3.4.2.). They maintain that one non-palatalized quality, whether termed neutral or velarized, is sufficient as being indicative of contrast between the consonants and any further subdivisions should be abandoned.

Without taking sides in this argument yet, let us consider some Old Irish data illustrating the problem of qualities from the traditional perspective. This selection is presented with a view to deciding whether the threefold division has any

synchronic impact on the shape of vowels in stressed syllables. The qualities of Old Irish consonants will be marked as follows: ($C^i$) for palatalized, ($C^u$) for rounded, and ($C^a$) for neutral ones. The possible contexts in which short vowels in stressed syllables (the first syllables of the word) occur are the following:

| | | | | | | |
|---|---|---|---|---|---|---|
| (17) | $C^i$ i $C^i$ | [$f^ir^i$] | *fir* | – ‘man’-gen.sg. | | |
| | $C^i$ i $C^u$ | [$f^ir^u$] | *fiur* | – ‘man’-dat.sg. | | |
| | $C^i$ i $C^a$ | [$k^in^aið^i$] | *cinaid* | – ‘fault’-nom.pl. | (rare) | |
| | $C^i$ e $C^i$ | [$N^eRt^i$] | *neirt* | – ‘strength’-gen.sg. | | |
| | $C^i$ e $C^u$ | [$N^eRt^u$] | *neurt* | – ‘strength’-dat.sg. | | |
| | $C^i$ e $C^a$ | [$N^eRt^a$] | *nert* | – ‘strength’ | | |
| | $C^a$ a $C^i$ | [$m^ak^i$] | *maicc* | – ‘boy’-gen.sg. | | |
| | $C^a$ a $C^u$ | [$b^aL^u$] | *baull* | – ‘limb’-dat.sg. | | |
| | $C^a$ a $C^a$ | [$m^ak^a$] | *macc* | – ‘boy’ | | |
| | $C^u$ o $C^i$ | [$k^uon^i$] | *coin* | – ‘hound’-dat.sg.[11] | | |
| | $C^u$ o $C^a$ | [$s^uon^a$] | *son* | – ‘sound’ | | |
| | $C^u$ o $C^u$ | [$R^uoθ^u$] | *routh* | – ‘wheel’-dat.sg. (Early Old Irish) | | |
| | $C^u$ u $C^i$ | [$s^un^i$] | *suin* | – ‘sound’-gen.sg. | | |
| | $C^u$ u $C^u$ | [$g^uuθ^u$] | *guth* | – ‘voice’ | | |
| | $C^u$ u $C^a$ | [$d^uv^ai$] | *dubai* | – ‘black’-nom.pl. | (rare) | |

We can see clearly above that word-initial consonants in Old Irish always obtain their quality from the following vowel which is invariably present. Therefore, if a consonant is followed by either [i] or [e], it is automatically palatalized by this vocalic expression. The same goes for *u*-quality consonants, which precede [o] or [u], and for neutral ones, which occur in front of [a]. Thus, in this position there is no need to postulate any subdivision of the broad consonants into *u*-quality and *a*-quality or even any division into slender and broad qualities since every word-initial consonant is only equipped with the quality provided by the following vowel, and this may tentatively be treated as a phonetic effect.

When we turn to vowels, no melodic restrictions in the vocalic expressions can be seen above and all these stressed vowels can appear before consonants of any quality. What follows these consonants, be it a vowel or an empty nucleus, is apparently also irrelevant as regards the shape of the preceding vowel.

[11] Although Thurneysen (1946:97) claims that [o] followed neutral consonants, this observation concerns this vowel in unstressed syllables. Now, since the behaviour of the alternation [u – o] is perfectly parallel to that of [i – e], it is assumed here that under primary stress this vowel is preceded by *u*-quality consonantal segments. Another argument for postulating this is that the prehistoric form of this word was *kuni.

Only three instances are slightly dubious. First, the form [k$^{i}$in$^{a}$ið$^{i}$] in which *a*-quality is assumed because it is marked in the spelling by the symbol *a*. The ancient version of this word is *kinuth (Thurneysen 1946:205), which suggests the *u*-quality of the nasal [n]. Second, the word [d$^{u}$uv$^{a}$i] also belongs to the so-called *u*-stems, which are words historically ending in *-u*. Also here the claim that the fricative [v] is neutral is based purely on the spelling. Third, the form [R$^{u}$oθ$^{u}$] is viewed as an archaic version of the Classical Old Irish [R$^{u}$oθ$^{a}$] *roth*, which is based on the assumption that *u*-quality was replaced by *a*-quality in some cases.

Thus, if we approach the examples of [k$^{i}$in$^{a}$ið$^{i}$] and [d$^{u}$uv$^{a}$i] with suspicion and ask why there are no monosyllables with high vowels followed by *a*-quality consonants, e.g. no words such as, say, the hypothetical [k$^{i}$in$^{a}$],[12] we may conclude that there is no convincing evidence that high vowels could ever occur in front of neutral consonants. The historical developments presented in (4.3.3.1.), e.g. *wirah → *wera → [f$^{i}$er] *fer* – 'man' indicate that the original [i] was obligatorily lowered to [e] before the non-high vowel in the ending. Moreover, looking back at [R$^{u}$oθ$^{u}$] *routh* – 'wheel'-dat.sg., the fact that examples of this sort are so rare suggests that they may be simply irregular developments.

The whole situation changes dramatically when we turn to the consonants which follow the stressed vowel. Here the quality of the consonant is of great importance. Not only does it determine the articulation of the consonant, but it also marks case and gender. Thus in the pair of [f$^{i}$ir$^{i}$] *fir* – 'man'-gen.sg. and [f$^{i}$ir$^{u}$] *fiur* – dat.sg. the case is marked by the quality of the final consonant, which is palatalized or rounded, respectively. There is also a three-way contrast in words such as [N$^{i}$eRt$^{a}$] *nert* – 'strength', [N$^{i}$eRt$^{i}$] *neirt* – gen.sg. and [N$^{i}$eRt$^{u}$] *neurt* – dat.sg., with neutral, *i*-quality or *u*-quality final consonants. Thus, three qualities seem salient as regards the marking of contrast. In the ensuing section a competitive view of the consonant qualities will be outlined, though.

### *4.3.4.2. Modern views on consonant qualities*

The main, and perhaps the only advantage of the threefold division of consonants advocated by Thurneysen, is the ability to differentiate between grammatical forms of lexical items. As an example let us consider three paradigmatic cases of the three words below:

[12] In fact, there are few words like [f$^{i}$iNd] *find* – 'white', whose Primitive Irish ending was *–a(h)*, but the quality of the final consonants is never marked in any way and hence it is impossible to establish what it was in Old Irish.

| (18) | NOMINATIVE SG. | GENITIVE SG. | DATIVE SG. | |
|---|---|---|---|---|
| a. | [f$^{i}$er$^{a}$] *fer* | [f$^{i}$ir$^{i}$] *fir* | [f$^{i}$ir$^{u}$] *fiur* | – ‘man’ |
| b. | [L$^{i}$eθ$^{a}$] *leth* | [L$^{i}$eθ$^{i}$] *leith* | [L$^{i}$eθ$^{u}$] *leuth* | – ‘half’ |
| c. | [b$^{a}$aL$^{a}$] *ball* | [b$^{a}$aL$^{i}$] *baill* | [b$^{a}$aL$^{u}$] *baull* | – ‘member’[13] |

In (18a) we can observe a vocalic alternation in the nucleus. The nominative displays the vowel [e], while the two remaining cases contain [i]. The only difference between the two latter cases is in the quality of the final [r], palatalized in the genitive [f$^{i}$ir$^{i}$] and rounded in the dative [f$^{i}$ir$^{u}$]. Thus, the phonemic contrast is rendered by the quality of the final segment: *i*-quality vs. *u*-quality.

From the logical viewpoint, if we wished to express contrast and said that the final consonant of the genitive is palatalized, while that of the dative is not, this would be a sufficient distinction: palatalized vs. non-palatalized (this is what we did in (12) above). The fact that the vowel of the nominative is lowered to [e] may theoretically be considered as an instance of the synchronic influence exerted on this nucleus by the *a*-quality of the following onset. However, we remember from (13), where the prehistoric developments of the word for ‘man’ were presented, that the occurrence of [e] is a result of the ancient vowel harmony, i.e. *wirah → *wera, and the fact that the prehistoric vocalic ending of *wera was dropped had no influence on the shape of the vowel in Old Irish. Thus, there is no need to maintain three qualities in the case of words like these from (18a) just for the sake of expressing contrast.

In (18b, c) the marking of contrast is more complicated as the only differentiating factor is the quality of the final consonant. The nominative is said to display *a*-quality, the genitive *i*-quality and the dative *u*-quality. The cases in (18a) and (18b) also exhibit an interesting discrepancy. Although the vowel in the nominative is the same in both examples, i.e. [e], this vowel does not alternate with [i] in the oblique cases in (18b). The vowel of the genitive [L$^{i}$eθ$^{i}$] does not change into [i] even though the final consonant is slender. In the ensuing sections it will be proposed that the two superficially identical *e*’s in (18a) and (18b) are in fact dissimilar.

This partition of consonants into three groups is contested by some scholars who propose a division similar to that in Middle and Modern Irish, namely into slender (palatalized) and broad consonants (Middle Irish neutral and Modern Irish velarized). Kuryłowicz (1971:67ff.) claims that contrast between palatalized and non-palatalized consonants is privative, that is, the former possess a quality which the latter lack, and does not go into detail about the type of the

[13] The genitive and dative have also such variants as *boill* and *bull*, respectively.

broad quality. One of the most constructive approaches to the issue of consonant qualities is that of Greene (1976:28ff.), which is adopted also by Kortlandt (1979:43ff.) and McCone (1996:26ff.), whose account appears to be most comprehensive. Thus, it will be referred to as 'Greene's and McCone's proposal'.

McCone (1996:27) criticizes Thurneysen for postulating *u*-quality and claims that such a move would "produce a grand total of no less than eighty seven consonant phonemes", which is a typologically incredible number also according to Greene (1956; 1962). Although in fact not every consonant would occur in every position in a word and in every environment, such an inventory may seem suspiciously great indeed, as long as the phonemic approach is adopted. Greene's and McCone's proposal is quite simple and obvious, namely not to recognize *u*-quality at all and to add "three short *u*-diphthongs to the inventory as an equally effective and eminently economical substitute for the twenty two velarized consonants otherwise required" (McCone's 1996:27). The short diphthongs would be *iu*, *eu* and *au* (Greene (1976) proposes that there should be four, including *ou*, but McCone states that the occurrence of this diphthong was so short-lasting that in Early Old Irish there is no need to mention it).

Thus, Greene's and McCone's idea is to dispense with *u*-quality, treat all the vowels of the dative as short *u*-diphthongs and reduce the number of consonant qualities in Old Irish to two. What is worth noting is that Greene and McCone do not claim that the neutral segments should be labelled as possessing *a*-quality. In their approach the cases in (18) would be interpreted as follows:

| (19) | NOMINATIVE SG. | GENITIVE SG. | DATIVE SG. | |
|---|---|---|---|---|
| a. | [f$^{i}$er] *fer* | [f$^{i}$ir$^{i}$] *fir* | [f$^{i}$iur] *fiur* | – 'man' |
| b. | [L$^{i}$eθ] *leth* | [L$^{i}$eθ$^{i}$] *leith* | [L$^{i}$euθ] *leuth* | – 'half' |
| c. | [baL] *ball* | [baL$^{i}$] *baill* | [bauL] *baull* | – 'member' |

In (19a) there is no problem with differentiating between the paradigmatic cases as the nuclei are realized in three different ways. In (19b, c) the contrast between the nominative and the genitive is rendered by the quality of the final vowel, nominative – neutral, and genitive – palatalized. The nominative and the dative differ as regards the nucleus, the former displaying [e] and [a] while the latter the diphthongs [eu] and [au], respectively.

In an approach recognizing two consonant qualities, the possible contexts for the occurrence of short vowels slightly change. Below only the palatalized consonants are indicated by the symbol (C$^{i}$), the neutral ones being left unmarked.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| (20) | $C^i$ | i | $C^i$ | [$f^ir^i$] | *fir* | – ‘man’-gen.sg. | | |
| | $C^i$ | e | $C^i$ | [$N^ieRt^i$] | *neirt* | – ‘strength’-gen.sg. | | |
| | $C^i$ | i | C | [$k^inid^i$] | *cinaid* | – ‘fault’-nom.pl. | or $C^i$ iu C | [$f^iur$] |
| | $C^i$ | e | C | [$f^ier$] | *fer* | – ‘man’ | or $C^i$ eu C | [$N^ieuRt$] |
| | C | a | $C^i$ | [$mak^i$] | *maicc* | – ‘boy’-gen.sg. | | |
| | C | o | $C^i$ | [$kon^i$] | *coin* | – ‘hound’-acc.sg. | | |
| | C | u | $C^i$ | [$sun^i$] | *suin* | – ‘sound’-gen.sg. | | |
| | C | a | C | [baL] | *ball* | – ‘limb’ | or C au C | [bauL] |
| | C | o | C | [son] | *son* | – ‘sound’ | | |
| | C | u | C | [guθ] | *guth* | – ‘voice’ | | |

After the elimination of *u*-quality, the number of possible contexts has decreased by five (fifteen contexts in (17), while ten here). These contexts show even more clearly that what matters for the quality of the short stressed vowel is the quality of the preceding consonant and what follows the vowel is much less important. In particular, no front vowel [i] or [e] can occur after initial broad consonants and vice versa. However, the vowels [a], [o] and [u] can precede slender consonants and the front vowels can be followed by neutral consonantal segments.

Despite the fact that this approach is impressive and economical, it is necessary to notice that there is a certain inconsistency in it. In particular, if contrast was so important, why was the number of diphthongs so painlessly reduced from four to three? As a consequence, in Old Irish there was no difference whatsoever between the paradigmatic cases of words such as [Roθ] *roth* – ‘wheel’ and [Roθ] *routh* – ‘wheel’-dat.sg. Moreover, we saw in some of the data in (18), e.g. [$f^ir^i$]/[$f^ir^u$] – ‘man’-gen.sg./dat.sg., that contrast can be sufficiently expressed by the quality of the final consonant even if the subdivision of the two broad qualities is not taken into account. In other words, the final [r] is palatalized in [$f^ir^i$] but neutral (not necessarily rounded) in [$f^ir$]. Thus, the idea that three qualities are an exaggeration seems a step in the right direction although it seems that it need not be combined with assuming the presence of any short diphthongs.

Looking at the data above, one may put forward an argument in favour of the hypothesis that the presence of only two qualities need not involve the concomitant change in the treatment of the vocalic system (by proposing the occurrence of new diphthongs). What is crucial is that the difference between paradigmatic cases can be usually guessed from the syntactic context. Specifically, the position of the nominative, e.g. *fer*, in the sentence (the subject) always differs from that of the oblique cases. The genitive *fir* cannot appear as the object or the locative, whereas the dative *fiur* is never found in possessive constructions. The accusative *fer* can theoretically be confused with the dative since their syntax is sometimes similar, but morphologically the accusative equals the nominative in

this particular declension, while in other declensions these alternations do not occur in closed syllables. Thus, the phonemic contrast did not need to exist at all.

These facts, although frequently overlooked by scholars attached to the idea of minimal pairs, seem quite important. What reinforces the view that phonological contrast between, say, *leth* and *leuth* – 'half'/dat.sg. may not have been present is that there are many examples where there is absolutely no difference, either in the spelling or in pronunciation, between the paradigmatic cases of a given item. For example, the Old Irish word for 'boy' is [mak] *macc*, its genitive being [mak$^{i}$] *maicc*, but the dative again [mak] *macc*. Thurneysen (1946:177) claims that in this and a few other instances the final consonant of the dative simply resists the change to *u*-quality. Nevertheless, if we look at the examples of words displaying *u*-infection confronted with exceptions, the latter seem to outnumber the former. Thus, it seems proper to conclude that, although eliminating *u*-quality is an important step, trying to maintain contrast at all costs, i.e. by introducing the new diphthongs, is not the most plausible approach.

Below we will carry out a historical analysis of the forms with the short diphthongs to see if their presence in Old Irish can be justified. Before this is done, however, let us consider briefly the phenomenon of consonant contrast in the history of Irish and the spelling conventions used in mediaeval times.

#### *4.3.4.3. A note on history and orthography*

In this section we shall try to find out whether the elimination of the consonants specified by a vocalic quality in the Old Irish phonological system is justifiable. Greene's and McCone's idea of postulating a system with one broad quality is by all means logical and one can hardly disagree with it. It is undoubtedly economical and effective. However, it is far from being obvious why, apart from *u*-quality, *a*-quality should be abolished as well.

Since the main function of the broad quality is rendering the contrast with palatalization, we cannot claim *a priori* which of the broad qualities should contribute to that opposition. Nor are we certain whether the broad quality should be defined by anything. Contemporary analyses of Modern Irish dialects such as Munster (Cyran 1997) and Connemara (Bloch-Rozmej 1998) attempt to show that nowadays the phonological system of Irish displays an opposition between palatalized (*i*-quality) and velarized (*u*-quality) consonants. To use GP terminology, slender consonants are defined by the element (I), while broad ones by (U). Interestingly, these two primes cannot combine in one vocalic expression. Looking at Modern Irish we see that, although non-palatalized segments are defined by the element (U), the degree of velarization differs considerably depending on the context. In particular, velarization manifests itself strongly in front of front

vowels, e.g. [m$^{u}$ik$^{i}$] *muic* – 'pig-dat.sg.', [s$^{u}$ip$^{i}$] *soip* – 'wisp-gen.sg.', whereas it is hardly audible before back vowels, e.g. [muk] *muk* – 'pig', [sop] *sop* – 'wisp', [kɑt] *cat* – 'cat'. Thus, were it not for the behaviour of the element (U) in the whole system of Irish, we could suppose that the element (A) is an equally good candidate for determining the broad quality. This does not seem to be the case, however, and although velarization is often inconspicuous, a thorough synchronic analysis indicates that it should be viewed as part of the system.

The properties of the system of Modern Irish cannot be directly mapped onto that of Old Irish because the lexicalization of certain alternations has undoubtedly occurred over the past fourteen centuries. For example, the typical Modern Munster Irish alternation of [a – i] in [f$^{i}$ar] *fear* vs. [f$^{i}$ir$^{i}$] *fir* – 'man'/gen.sg. is a reflection of the lexicalized Old Irish exchange of [e – i] in [f$^{i}$er] *fer* vs. [f$^{i}$ir$^{i}$] *fir* – 'man'/gen.sg., which results from the prehistoric phonological alternation of *wera vs. *wiri. Thus, a purely synchronic analysis of this alternation in Old (and Modern?) Irish can be carried out only as an intellectual exercise.[14] Nonetheless, one may wonder why these two systems should be different with respect to consonant qualities since a number of words have changed little in the course of time and there is no clear evidence that the consonants have changed at all in those items, e.g. the final consonant in the genitive [f$^{i}$ir$^{i}$] *fir*.

One historical quasi-argument in favour of postulating *a*-quality instead of *u*-quality as broad is that traditional descriptions of Middle Irish use terms such as 'neutral' or 'middle' to depict the non-palatalized quality. Dottin (1913:3) claims that although in Old Irish there were three qualities, that is, anterior (*i*-quality), middle (*a*-quality) and posterior (*u*-quality), the Middle Irish system is different and we can observe 'l'articulation antérieure' and 'l'articulation moyenne'. Such a division amounts to claiming that there were palatalized and non-palatalized consonants in Middle Irish and calling the broad consonants 'middle' or 'neutral' may reflect only too literal a treatment of spelling conventions used in Old and Middle Irish. One of the problems faced by a scholar is that both Old and Middle Irish texts were written by mediaeval scribes who spoke only Middle Irish and who may have neglected certain differences between the relevant periods. In Dottin's approach the difference between middle (*a*-quality) and posterior (*u*-quality) Old Irish consonants consists in the ways lexical items were written. It might be the case, though, that there was no other way of representing a broad consonant preceding a front vowel except for inserting a low back vowel symbol, mostly *a*, between the two sounds in question. For example, in order to convey the correct pronunciation of the word *feraib*, which is [f$^{i}$eriv$^{i}$] or [f$^{i}$erəv$^{i}$] – 'man'-dat.pl., a medieval scribe had no other option but to insert the symbol *a*

[14] See Jaskuła (1996) for a purely synchronic analysis of Old Irish vowel alternations.

between the broad consonant [r] and the actual vowel [i] or [ə]. Otherwise, if he had employed the symbol *u*, the word might have been incorrectly pronounced as [f$^{i}$eruv$^{i}$] or misinterpreted. The same goes for the cases in (17) above, e.g. [k$^{i}$inið$^{i}$] *cinaid* – 'fault'-nom.pl. and [d$^{u}$uvi] *dubai* – 'black'-nom.pl. The symbol *a*, although it indicates the broadness of the preceding consonant, does not have to represent its *a*-quality. In the case of monosyllabic words, so as to mark the broad quality of the word-final consonant, the vocalic symbol *u* was employed. For example, for marking the broadness of the final [r] in the word *fiur* – 'man-dat.sg.' the letter *u* was safely used. Any other symbol would indicate the presence of a back vowel or a diphthong. Besides, the vocalic symbol *u* was used as a case marker. For instance, if the scribe had written the letter *a* after the vowel [i] in the dative *fiur*, the whole utterance may have been interpreted as a disyllabic word. The interpretation of such orthographic sequences as two vowels separated by hiatus is commonplace, e.g. [bi-əð]/[bi-ið$^{i}$]/[bi-uð] *biad*/*biid*/*biud* – 'food'/gen.sg./dat.sg. In any case, the two scribal conventions were to mark the broad quality of word-internal consonants by *a* and of word-final ones by *u*. Interestingly, these principles were very rarely confused and that occurred mainly in earlier manuscripts (Thurneysen 1946:107). Thus, the orthographic use of vocalic symbols does not help in deciding either how many consonant qualities were present in Old Irish or, if there were only two, what they actually were.

Although we have not found any clue as to which vocalic symbol should determine the broad quality, Greene's and McCone's proposal to recognize three short diphthongs remains to be analyzed because it helps to differentiate between paradigmatic cases of words, e.g. [L$^{i}$eθ] *leth* vs. [L$^{i}$euθ] *leuth* – 'half'/dat.pl. It has already been argued that the marking of contrast at all costs is not a fortunate idea, but we cannot *a priori* discard the view that in some cases opposition may have existed. Thus, the origins of *iu*, *eu*, and *au* will now be inspected in detail.

### *4.3.5. The hypothetical short diphthongs*

#### *4.3.5.1. The alternation* [i – e] *revisited – the short diphthong* [iu]

As shown in (13c), *wiru: → *wiru → [f$^{i}$ir] *fiur* – 'man'-dat.sg., the original [i] was preserved in both Primitive and Old Irish if the vowel in the following syllable was the high [u]. (14c) revealed that the original [e] was raised in the same environment, e.g. *senu: → *sinu → [s$^{i}$in] *siun* –'old'-dat.sg.

McCone (1996:112), following Greene (1976:29), offers an alternative interpretation of these changes and employs the notion of *u*-infection to explain the origin of three *u*-diphthongs. He proposes that the sequence of events was as follows: *wiru: → *wiru → (u-infection) *wiuru → [f$^{i}$iur] *fiur* – 'man'-dat.sg. and, therefore, *senu: → *sinu → (u-infection) *siunu → [s$^{i}$iun] *siun* –'old'-dat. sg.

Briefly, before it disappeared from the ending, the prehistoric vowel [u] affected the non-back vocalic segment in the preceding syllable. By contrast, the long vowel [uː] which did not disappear had no impact on the preceding vowel, e.g. *wiruːh → *wiruː → [fʲiru] *firu* – 'man'-acc.pl.

Greene (1976:30) notes, however, that in cases such as *fi(u)ss* – 'knowledge'-nom.sg. and dat.sg. (identical) the spelling with *-u-* is maintained in the dative, that is [fʲius], while it is rather avoided in the nominative, where it probably represents [fʲis]. Although in McCone's approach this word undergoes the treatment similar to that of *fiur*, the relative consistency in writing only the dative with the symbol *u* may suggest that it was indeed a sort of case marker rather than an exponent of a prehistoric or synchronic phonological process. This view seems supported by the fact that the datives of [RʲiNd] *rind* – 'star' and [mʲiːð] *mid* – 'mead' never display any orthographic *u*-infection (i.e. they are identical to the nominatives) even though they belong to the same declension as *fi(u)ss* – 'knowledge'. Therefore, there is no convincing evidence to take for granted that the orthographic *iu* stood for the short diphthong.

*4.3.5.2. The short diphthong* [au] *and the alternation* [a – u]

Below we analyze the origins of the hypothetical short diphthong [au] which, in McCone's proposal alternates with [a] in cases like [baL] *ball* vs. [bauL] *baull* – 'member'/dat.sg. Since this diphthong is frequently in fluctuation with [u], e.g. [bauL] *baull* or [buL] *bull* – 'member'-dat.sg., the rare alternation of [a – u] will be examined in detail as well.

Greene (1976:28) attributes the origin of all the three short *u*-diphthongs primarily to the *u*-infection of [a]. Here, unlike in the case of the diphthong [iu] described above, the disappearance of the prehistoric high back vowel in the vocalic ending was unimportant to the *u*-infection of the preceding vowel. Thus, in McCone (1996:111) we find: *baLuː → *baLu → *bauLu → [bauL] *baull* – 'limb'-dat.sg., where the *u*-ending is lost before Old Irish, vs. *baLuːh → *baLuː → *bauLu → [bauLu] *baullu* – 'limb'-acc.pl., where the *u*-ending remains. The alternative variant of the dat.sg. is [buL] *bull*, while that of the acc.pl. is [buLu] *bullu*. The development of the acc.pl. shows that in the cases with the stressed [i], e.g. *firu* – 'man', the retained [u] does not have any impact on the preceding high vowel. When the stressed stem vowel is [a], as in *baullu*, *u*-infection may be present. Even more interestingly, the gen.sg., apart from the regular *baill*, often surfaces as *boill*. Thus, deciding which variants are regular in the genitive and dative singular and in the accusative plural is one problem. What caused all these fluctuations is another.

Before we attempt to answer these questions, let us recall that words such as [mak] *macc* – 'boy', [marəv] *marb* – 'dead', [kaθ] *cath* – 'battle', [salәm] *salm* – 'psalm', and many others resist *u*-infection in the dative singular even though the declensions they belong to normally display the orthographic *u*, as noted by Thurneysen (1946:106). He states that, as a rule, after the original [a], the consonants [χ], [k], [θ], [ð], [s] do not display *u*-quality, but there are exceptions.

An interesting observation is made by Lewis and Pedersen (1974:103), who claim that in the original Proto-Celtic vowel [a] in syllables beginning in a labial, which must be [b, m, w], or a labiovelar [$k^w$, $g^w$] was rounded in Primitive Irish. What can be inferred from this remark is that this vowel may have occasionally been treated as a sort of [ɒ]. As an example, they provide the word [kraN] *crann* – 'tree', whose genitive singular is [kruN$^i$] *cruinn*, the dative singular being [kruN] *crunn*. This word was mentioned in (3) above as one illustrating the UNTYPICAL [a – u] alternation. Thurneysen (1946:50) notes that the initial [k] in this word derives from the labiovelar [$k^w$] and that the vowel of the nominative [kraN] is secondary. Indeed, otherwise this alternation resembles the pattern observed in [kloθ]/[kluθ$^i$]/[kluθ] *cloth*/*cluith*/*cluth* – 'fame'/gen.sg.dat.sg. in (12b), which represents the most TYPICAL [o – u] alternation.

Greene (1976:29) argues that the Old Irish [u] of the dative derives from the earlier short diphthong [au] via *u*-infection. This [au] survived in some items but was simplified to [u] in others. We may infer from this description that the development was *$k^w$rannu → *krauNu → [kruN]. This is perfectly justifiable provided that in Primitive Irish [u] really infected the preceding vowels in the dative of this particular declension. However, the vowel [u] of the genitive [kruN$^i$] cannot be accounted for in a similar fashion since the primitive ending was a high front vowel, as in *wiriː → *wiri → [f$^i$ir$^i$] *fir* – 'man'-gen.sg. in (13b) above. Thus, we must assume that, according to the 'vowel harmony principle' proposed in the previous sections, the genitive of the word for 'tree' developed in the following way: *$k^w$rɒnniː or *$k^w$runniː → *kruNi → [kruN$^i$], while the dative was *$k^w$rɒnnuː or *$k^w$runnuː → *kruNu → [kruN]. Consequently, the nominative was *$k^w$rɒnnan → *kraNa → [kraN]. Since the low [ɒ] was no longer part of the inventory in Primitive Irish, this vowel was reinterpreted as the closest possible relative, that is [a]. The discrepancy between the spelling of the dative, that is *craunn* vs. *crunn*, may result from diverse interpretations of the original vocalic segment in different dialects. In other words, some speakers interpreted this [ɒ] as [o] and the regular [o – u] alternation was applied. Others treated it as [a] and the orthographic diphthongization to *au* occurred. The hesitation of the speakers seems confirmed by the fact that the (rare) alternative genitive is [kraN$^i$] *crainn*, which is based on the assumption that the stem vowel was really [a]. These stipulations cannot be either proved or disproved, however, because we have no

knowledge whatsoever of the dialects of Old Irish. We only know that in Middle Irish the regular genitive was [kraN$^{i}$] *crain(d)* (Quin *et al.* 1983:155), which may suggest that two competitive variants existed side by side until one triumphed.

In terms of elements, we may say that the vowel [a] is represented by (A), while the low [ɒ] should be regarded as a pair of (A, U). What must be added here is that, since we already represented one type of [o] by the same combination, this one must somehow differ, possibly with respect to headedness. In this section we assume that the vowel [ɒ] is reinterpreted either as [a] or as [o]. This may mean that the element (A) is more important than (U) for the shape of [ɒ]. Consequently, [ɒ] may be viewed as (A, U) with the more important element enjoying the status of a headed prime. As regards the vowel [o], it may be viewed as (A, U). The foregoing discussion is summarized below.

(21)

a. *k$^{w}$rɒnnan → [ɒ] = [a] → *kraNa → [kraN] *crann* – ‘tree’

b. *k$^{w}$rɒnni: → [ɒ] = [o] → *kruNi → [kruN$^{i}$] *cruinn* – ‘tree’-gen.sg.
→ [ɒ] = [a] → *kraNi → [kraN$^{i}$] *crainn* – ‘tree’-gen.sg.

c. *k$^{w}$rɒnnu: → [ɒ] = [o] → *kruNu → [kruN] *crunn* – ‘tree’-dat.sg.
→ [ɒ] = [a] → *krauNu → [krauN] *craunn* – ‘tree’-dat.sg.

Thus, the original stem vowel [ɒ] was unrounded to [a] in the nominative, probably under the influence of the segment [a] in the ending, as shown in (21a). In the first version of the genitive (21b), i.e. [kruN$^{i}$] *cruinn*, the original [ɒ] was reinterpreted as [o] and, subsequently, raised to [u] because of the high vowel [i] in the ending. In terms of the element make-up, there was no element (A) in the ending to support the same prime in the stem vowel. The other variant, that is [kraN$^{i}$] *crainn*, must have involved the reinterpretation of the original [ɒ] as [a]. Given that [a] did not alternate (see the following sections), this vowel remained until Old Irish. The development of the dative is twofold as well. When the original [ɒ] was reinterpreted as [o], the raising to [u] occurred because there was nothing in the ending to support the prime (A) in the stem vowel. The Old Irish result was [kruN] *crunn*. When the prehistoric [ɒ] was reinterpreted as [a], the hypothetical (orthographic) *u*-infection followed and the Old Irish form *craunn* surfaced in the spelling.

Similar developments must have taken place in [bauL] *baull* vs. [buL] *bull* – ‘limb’-dat.sg. and in [bauLu] *baullu* vs. [buLu] *bullu* – ‘limb’-acc.pl. Also in these examples only the occasional spelling suggests that *u*-infection may have

occurred as a phonological phenomenon. As regards the fluctuation of [baL$^{i}$] *baill* vs. [boL$^{i}$] *boill* – 'limb'-gen.sg., the former form is regular, while the latter must have been a reinterpretation of the vowel [a] as [o] by some language users. This reanalysis was probably influenced by the dative form [buL] *bull* and the application of the regular alternation of [o – u].

To summarize, the developments presented in this section indicate that different reinterpretations of the original back vowel [ɒ] which took place between early Primitive Irish and Old Irish resulted in dissimilar variants of the same lexical items in Old Irish. However, no convincing evidence had been found to maintain that the digraph *au* represented a real phonological object, i.e. the short diphthong [au], in Old Irish. More importantly, we have not provided any reason why the vowel [a] did not change even if there was no prime (A) in the synchronically available vocalic ending, e.g. *kraNi → [kraN$^{i}$] *crainn* – 'tree'-gen.sg.

In the ensuing section we will continue to look for evidence which would allow us to treat the spelling convention employing the letter *u* as a case marker in terms of phonetic reality. Since the third short diphthong, i.e. [eu], is said to occur on the basis of the vowel [e] which does not otherwise alternate, unlike the other [e] which alternates with [i] (see (12) above), the analysis of this opaque [e] will be combined with an examination of other non-alternating short vowels, including [a], [i], and [o].

#### *4.3.5.3. The short diphthong* [eu] *and the non-alternating vowels*

In this chapter we have been dealing with different vocalic alternations, among which [i – e] and [o – u] are the most regular. In the course of the discussion we found, however, that there are some vowels in Old Irish which do not alternate at all. One example was the segment [a] in, say, [kaθ] *cath* – 'battle', which does not change in any circumstances. We can also add the vowel [e], e.g. [eχ] *ech* – 'horse', whose genitive is [eχ$^{i}$] *eich*, contrary to the expected *[iχ$^{i}$], while the dative is [eχ] or [euχ] *euch* (if we recognize the diphthong [eu]), which appears instead of [iχ] or [iuχ], which we would expect on the basis of [f$^{i}$er]/[f$^{i}$ir$^{i}$]/[f$^{i}$ir] – 'man'/ gen.sg./dat.sg. Moreover, the Old Irish [o] sometimes refuses to alternate as well.

In (22) below the regular changes of [i – e] and [u – o] are contrasted with the absence of alternations in either [e] or [o]. Let us recall that the synchronic presence/absence of a vocalic ending in Old Irish has no impact on the alternations because these are based on the prehistoric 'vowel harmony principle'.

| (22) | NOMINATIVE | GENITIVE | DATIVE | |
|---|---|---|---|---|
| | a. ***regular*** | [i – e] | | |
| [f$^{i}$er] | *fer* | [f$^{i}$ir$^{i}$] | *fir* | [f$^{i}$ir]/[f$^{i}$iur] *fiur* | – ‘man’ |
| [f$^{i}$iRt]/[f$^{i}$iuRt] | *fi(u)rt* | [f$^{i}$eRto] | *ferto* | [f$^{i}$iRt]/[f$^{i}$iuRt] *fi(u)rt* | – ‘miracle’ |
| [f$^{i}$is]/[f$^{i}$ius] | *fi(u)s(s)* | [f$^{i}$eso] | *feso* | [f$^{i}$is]/[f$^{i}$ius] *fi(u)s(s)* | – ‘knowledge’ |
| | b. ***absence of*** | [i – e] | | |
| [N$^{i}$eRt] | *nert* | [N$^{i}$eR$^{i}$t$^{i}$] | *neirt* | [N$^{i}$eRt]/[N$^{i}$euRt] *neurt* | – ‘strength’ [15] |
| [L$^{i}$eθ] | *leth* | [L$^{i}$eθ$^{i}$] | *leith* | [L$^{i}$eθ]/[L$^{i}$euθ] *leuth* | – ‘half’ |
| [m$^{i}$es] | *mes(s)* | [m$^{i}$eso] | *mes(s)o* | [m$^{i}$es] *mes(s)* | – ‘judgement’ |
| | c. ***regular*** | [u – o] | | |
| [son] | *son* | [sun$^{i}$] | *suin* | [sun] *sun* | – ‘sound’ |
| [kloθ] | *cloth* | [kluθ$^{i}$] | *cluith* | [kluθ] *cluth* | – ‘fame’ |
| [guθ] | *guth* | [goθo] | *gotho* | [guθ] *guth* | – ‘voice’ |
| | d. ***absence of*** | [u – o] | | |
| [korp] | *corp* | [kor$^{i}$p$^{i}$] | *coirp* | [korp] *corp* | – ‘body’ [16] |
| [foLt] | *folt* | [foL$^{i}$t$^{i}$] | *foilt* | [foLt] *folt* | – ‘hair’ [17] |

In both (22a) and (22c) we can observe the regular [i – e] and [u – o] alternations, respectively, which were caused by vowel height harmony in Primitive Irish. Let us recall that whenever there was a prehistoric high vowel following the stem vowel in the next syllable, the stem vowel was also high. The presence of a mid or low back vowel in the vocalic ending meant that the stem vowel had to be mid as well. In (22b) the exceptions to the alternation [i – e] are shown, where the vowel *e* does not undergo raising irrespective of the environment, e.g. the genitive [N$^{i}$eR$^{i}$t$^{i}$] *neirt* should regularly develop into *[N$^{i}$iR$^{i}$t$^{i}$] because the primitive form was *nerti, while both the nominative and dative of [m$^{i}$es] *mes(s)* should surface as *[m$^{i}$is] or *[m$^{i}$ius] since their earlier versions were *messu. Finally, (22d) shows a relatively infrequent resistance of [o] to change to [u]. The further development of the paradigmatic cases of the word for ‘body’, that is *corp*, and a few similar ones (see notes below) indicate, however, that there must have existed doubles, that is both regular and irregular variants, some of which gave way to the others in the course of time.

[15] Later, also [N$^{i}$iR$^{i}$t$^{i}$] and [N$^{i}$iuRt] for the genitive and dative, respectively.
[16] Later, the oblique cases displayed the regular alternation, i.e. gen. [kur$^{i}$p$^{i}$] *cuirp* and dat. [kurp] *curp*.
[17] Later, also [fuL$^{i}$t$^{i}$] *fuilt* and [fuLt] *fult* for the genitive and dative, respectively.

Thus, all the examples in (22) show a general tendency. In particular, exceptions to typical vocalic alternations are few and far between and sometimes the exceptional forms display the regular changes as well. If there are exceptions, though, it is never the case that the high vowel remains unaltered, it is invariably the mid one, either [e] or [o].[18]

The exceptions and fluctuating variants of some paradigmatic cases are not surprising given that certain segments may have been interpreted in different ways. If we recall the examples of *baill* vs. *boill* for the genitive singular of *ball* – 'limb' in the previous section, we may conclude that regularities prevail and the only problem occurs in the case of the non-alternating [e]. However, if we look closely at the data in different sources based on archaic material (e.g. in Quin *et al.* 1983), we find surprising spellings such as *ich* for 'horse'-gen.sg. or *leithe* for 'half'-gen.sg. These facts may mean at least two things.

Firstly, as implied above, the declensions to which the forms listed in (22) belong may have been mixed up in prehistoric times, which entailed the confusion of endings and subsequent apparent irregularities. We have already seen the cases (4.3.1.2.) where the endings of one declension were used for another.

Secondly, in prehistory there may have existed similar vocalic expressions with different phonological structures, which resulted in their either ability or inability to alternate. For example, the vowel *e* alternating with [i] was perhaps close [e], while the non-alternating one may have been [ɛ]. Unfortunately, there is no indication of these differences either in Ogam inscriptions or in mediaeval materials. Moreover, there are too few non-alternating *e*'s to suggest more general conclusions as yet.

Apart from the resistance to alternation of [e], [a], and [o], the other unsolved problem is that of orthographic or phonetic diphthongization of [i] to [iu] and [e] to [eu]. However attractive Greene's and McCone's proposal to recognize the orthographic sequences of *iu* and *eu* as short diphthongs may appear, the lack of convincing evidence seems to disfavour this idea. It is true that in many lexical items the letter *u* was used regularly, e.g. *fiur*, *euch*, but in others, e.g. *fi(u)ss*, it was anything but stable, while in words like *mess* it never occurred. It does not appear, then, that the occasional *u*-marking of certain paradigmatic cases had any phonetic importance, not to mention phonological significance. Therefore, so far the replacement of *u*-quality by the recognition of short *u*-diphthongs, as advocated by these scholars, seems as redundant as the acknowledgment of

[18] The counterexamples are *find* – 'white', which should have developed [e], like *fer* – 'man', i.e. **fend*, and *mind* – 'diadem', whose dat.pl. should have been **mendaib* instead of *mindaib*, by analogy with *rind* vs. *rendo* – 'star'/gen.sg. The ancient developments of these words are uncertain, though, and the scarcely attested versions may be unreliable.

Thurneysen's *u*-quality itself. The conclusion may be that contrast between the paradigmatic cases of lexical items was expressed either by the syntactic use of these cases or by the palatalization vs. non-palatalization of consonants.

Now let us return to the problem of [a], which appears to be the only truly non-alternating short vowel. Let us recall that some *a*'s allegedly diphthongize to [au], e.g. [baL]/[bauL] *ball*/*baull* – 'limb'/dat.sg., or alternate with [u], e.g. [baL]/[buL] *ball*/*bull*, depending on the interpretation. The developments in the previous section suggest that in the former pair we are actually dealing with an orthographic case marker which represents no phonological object, i.e. [baL] = [baL] *ball*/*baull* – 'limb'/dat.sg., while in the latter different reinterpretations of the stem vowel [ɒ] led to the occurrence of dissimilar stem vowels in Old Irish, i.e. *bɒlla → *balla vs. *bɒllu → *bollu → *bullu, which resulted in [baL]/[buL] *ball*/*bull* – 'limb'/dat.sg. Other *a*'s did not undergo any melodic modification or, in Thurneysen's terms, the consonants following them did not display *u*-quality, e.g. [kaθ] *cath* – 'battle', originating from the stem *kathu. The same goes for the dative of [mak] *macc* – 'boy', which does not differ from the nominative, although it should ideally be diphthongized to produce *[mauk] or alternate with [u] and surface as *[muk]. What is worth noting is that we are dealing here with a labial word-initial consonant, which should theoretically provide roundness to the vowel [a], as it does in, say, [maɣ] *mag* – 'field' from *maɣah, whose dative is [maɣ$^{i}$] *maig*. This is a regular development before primitive palatalized endings, i.e. *maɣih. The alternative dative is [muɣ$^{i}$] *muig*, which must have been formed according to the vowel height harmony and the treatment of the vowel [a] following a labial as [ɒ], which leads to the occurrence of the regular [o – u] alternation.

As shown in (4.3.5.2.), the vowel [a] is not sensitive to *u*-infection before [χ], [k], [θ], [ð], and [s]. At first glance, this set seems logically selected since it contains only obstruents (mostly spirants), none of which being a labial. This might mean that most non-labial obstruents simply resist *u*-quality. However, if we consider words such as *euch* – 'horse'-dat.sg., *leuth* – 'half'-dat.sg., *fi(u)ss* – 'knowledge' or even *routh* – 'wheel' (the only example of the ephemeral *ou* diphthong), all displaying *u*-quality or allowing the alleged diphthongization of the vowel, it is more than obvious that the problem is not in the consonant. Thus, there is something about the vowel [a] in certain items that immunizes it against *u*-infection, whatever this process phonologically means.

Moreover, in (4.3.1.2.) it was argued that the element (A) has to be doubly linked so as to survive in the structure, e.g. *wisso: → *weso – 'knowledge'-gen.sg. (lowering, A-support from the ending), and *melis → *mili – 'honey' (raising, absence of (A) in the ending). In the development of the genitive [mak$^{i}$] *maicc* – 'boy', we must distinguish phases in which the vowel [a], represented

by the prime (A), was followed by the vowel [i] in the vocalic ending, i.e. *mak$^{w}$k$^{w}$iː → *makki. Despite that, the vowel survived into Old Irish without any support from the element (A) in the ending.

It was mentioned above and in the introductory chapter that GP frequently employs the notion of headedness, an idea based on the assumption that asymmetric relations obtain between the elements constituting a given segment. This concept is also useful when phonological primes occur in given expressions alone. For example, in Polish the element (I) can stand for two phonetic objects (Cyran 1997:33): if it is headed (I), it surfaces as [i], as in [m$^{i}$ina] *mina* – 'face', whereas the headless (I) stands for the phonetic [ɨ], as in [tɨlko] *tylko* – 'only'. The same solution may be proposed for the Old Irish dichotomy between the *u*-sensitive [a], and the non-alternating [a]. We will see whether this is a feasible proposal in the following sections. First, however, we will analyze a group of Old Irish vowels which do not display any synchronic alternations.

### *4.3.6. Other prehistoric harmony effects*

Apart from easily noticeable prehistoric vowel harmony effects, which synchronically manifest themselves mostly in the Old Irish alternations of [i – e] and [o – u], in Primitive Irish there also occurred similar harmony processes which are not detectable if the Old Irish data are analyzed from an exclusively synchronic perspective. These harmony effects shed much light on the mechanisms operating in the prehistory of Irish and provide us with the appropriate background if we wish to comprehend what was behind the vocalic changes and what predictions can be made about the possible structure of the vocalic expressions. In other words, they can reveal what was regular and what was idiosyncratic about the pre-Old Irish short vowels.

Bearing in mind that the Old Irish changes such as [i – e] and [o – u] were triggered by the presence of different vocalic endings in Primitive Irish, e.g. *wirah → *wera → [f$^{i}$er] *fer* vs. *wiriː → *wiri → [f$^{i}$ir$^{i}$] *fir* – 'man'/gen.sg., let us consider a few cases which do not involve any synchronic alternations in Old Irish, e.g. [laNd] *land* vs. [LaN$^{i}$d$^{i}$e] *lainde* – 'area'/gen.sg. The reason why the stem vowel does not alternate here may be that some vocalic endings in Primitive Irish were apparently not responsible for triggering vocalic changes in these particular paradigmatic cases. If a change occurred, it affected the vowel in all the cases. If some cases displayed a different vowel, levelling took place and Old Irish does not show any alternations.

Below we can observe the Primitive Irish retraction of [æ] to [a] (McCone 1996:112) before consonant clusters and back non-high vowels in (23a), and the raising of [æ] to [ɪ] before the same clusters followed by a high vowel in (23b):

(23) a. RETRACTION OF [æ] TO [a] BEFORE BACK VOWELS

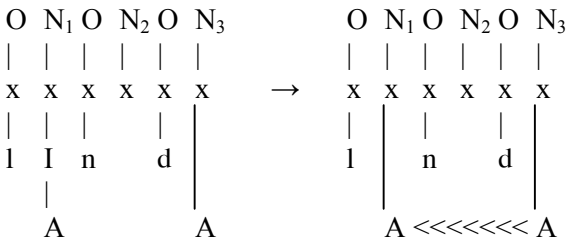
| | | | | |
|---|---|---|---|---|
| *lænda: | → *laNda | → [laNd] | *land* | – 'area' |
| *ændan | → *aNdan | → [aNd] | *and* | – 'there' |
| *kæmbah | → *kamba | → [kamb] | *camb* | – 'crooked' |

b. RAISING OF [æ] TO [ɪ] BEFORE HIGH VOWELS

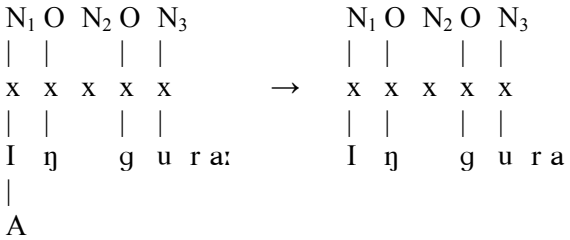
| | | | | |
|---|---|---|---|---|
| *kæmbijaθih | → *kɪmbijaθih | → [k$^{i}$im$^{i}$b$^{i}$ið$^{i}$] | *cimbid* | – 'prisoner'[19] |
| *æŋgura: | → *ɪŋgura | → [iŋgər] | *ingor* | – 'anchor' |

In all these cases the stressed stem vowels are separated from the unstressed ones by nasal+obstruent clusters. These consonant groups have no impact on the process of vowel harmony, although it is interesting that these particular raisings and retractions occurred in the immediate vicinity of nasals followed by homorganic stops. The changes in (23a, b) can be graphically represented as follows:

(24) a. *lænda: → *laNda – 'area'




b. *æŋgura: → *ɪŋgura – 'anchor'




In (24b) when there is no prime (A) in the following realized nucleus ($N_3$) and, consequently, A-support is absent, the only element to survive under ($N_1$) is (I), which is realized as the mid-high front vowel. This development resembles what

[19] See McCone (1981) and Jaskuła (1998) for analyses of voicing of obstruents, e.g. [θ] to [ð] in [k$^{i}$im$^{i}$b$^{i}$ið$^{i}$].

we could see in *melis → *mili in (9b), where the raising of the original mid-vowel [e] was shown. When the vocalic ending had no prime (A) in its structure, this element was also withdrawn from the stem vowel. Let us assume that the element make-ups of [e] and [æ] are (A, I) and (A, I), respectively.

In (24a) the presence of the prime (A) in the vocalic ending ($N_3$) contributes to the strengthening of the same element in the stem vowel in ($N_1$). As a result, the element (I) is no longer licensed under ($N_1$). This case is to a certain extent parallel to that in (9a), that is *wisso: → *weso, where the presence of the prime (A) in the vocalic ending resulted in the occurrence of the same element in the stem nucleus. Here, however, we can see the total suppression of the prime (I), which resembles *deɣ$^{w}$ih → *dæɣ$^{w}$i → [daɣ$^{i}$] *daig* – 'flame', as shown in (11).

The developments represented in (24) were regular. Now let us consider two cases which should have developed like the one in (24b) but they did not.

(25) ***Raising Stage***

| | | | | |
|---|---|---|---|---|
| *lændija:s | → *lɪNdija | → *lɪNde | → [LaN$^{i}$d$^{i}$e] *lainde* | – 'area'-gen.sg. |
| *kæmbi: | → *kɪmbi | → *kɪmb | → [kam$^{i}$b$^{i}$] *caimb* | – 'crooked'-gen.sg. |

In these cases the stressed stem vowel [æ] was regularly raised to [ɪ] before the high vowel in the ending. Contrary to what we would expect, taking into account the changes such as *æŋgura: → *ɪŋgura → [iŋgər] *ingor* – 'anchor' (23b), the stem vowel in Old Irish surfaces as [a] and not [i]. According to McCone (1996: 78), the regular forms *LiNd$^{i}$e – 'land'-gen.sg. and *k$^{i}$im$^{i}$b$^{i}$ – 'crooked'-gen.sg. were "eradicated in favour of the *a*-vocalism". This levelling of the stem vowel is based on the perfectly regular development of the nom.sg., i.e. *lænda: → *laNda → [laNd] *land*, as shown in (23a), and the other paradigmatic cases.

Although in Old Irish there was neither [ɪ] nor [æ], nor the alternation between these two, these sounds were important members of the Primitive Irish vowel inventory. Moreover, the regular developments described in this section agree with our previous findings which indicate that nearly all the Primitive Irish vocalic alternations were triggered by the presence/absence of the prime (A) in the vocalic ending. Since the prehistoric changes discussed so far indicate that the Primitive Irish vocalic inventory was more numerous than that of Old Irish, we need to approach both systems of short vowels in terms of element structure.

### *4.3.7. Prehistoric element interactions – headedness*

Trying to explain the changes shown in (23) as well as all those described in this chapter in terms of element interactions, we need to reconsider our assumptions as regards the element make-ups of all short vowels which have been in use up

to this point. So far we have been assuming that the Old Irish [e] can be represented as (A, I), [i] as (I), [a] as (A), [o] as (A, U), and [u] as (U). If we look at Old Irish alone, there seems to be no need to postulate other structures or resort to the notion of headship. When we consider the historical changes, though, we see that there were probably dissimilar *i*'s and *e*'s, there was the vowel [æ], and possibly different *o*'s as well. These segments must be differentiated by means of head-operator relations between the resonance elements. Thus, theoretically, the set of Primitive Irish short vowels can be elementally represented as follows:

(26)

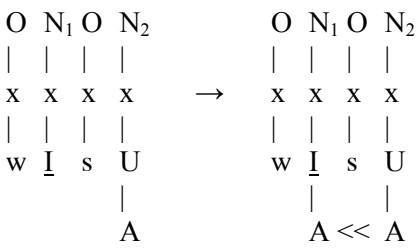
| | | | |
|---|---|---|---|
| [ɪ] | (I) | [i] | (I) |
| [e] | (I, A) | [ɛ] | (A, I) |
| [æ] | (A, I) | [a] | (A) |
| [o] | (A, U) | [ɒ] | (A, U) |
| [u] | (U) | | |

It should be borne in mind that these element representations are purely hypothetical. Now we need to look again into the synchronic and diachronic changes and decide whether these structures can be justified.

*4.3.7.1. Primitive Irish changes and structures of front vowels*

Let us begin with the prehistoric alternation [i – e] and the change of [æ] to [ɪ] so as to determine the structures of front vowels. As shown in (9a) and (24a) the prime (A) spreads from the end of the word to affect the stem vowel. This high vowel is always lowered after the spreading. If (A) is absent from the ending, it is forbidden from the stem vowel too. The relevant cases are reanalyzed and juxtaposed below, where the front vowels [i] and [e] are represented by (I) and (A, I), respectively.

(27) *wisoː → *weso – 'knowledge'-gen.sg.

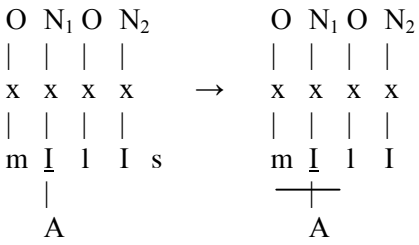



The original vowel [i] in ($N_1$), containing the headed (I), is affected by A-spreading from ($N_2$). As a result, the vowel [e] is formed, whose element structure

must be (I, A). The vowel [o] in the nucleus ($N_2$) is not considered as a headed expression because there is no evidence as yet that it should be treated as such.

Now, let us reconsider the reverse situation, which is the raising of the original [e] to [i] without the support from (A) in the following nucleus.

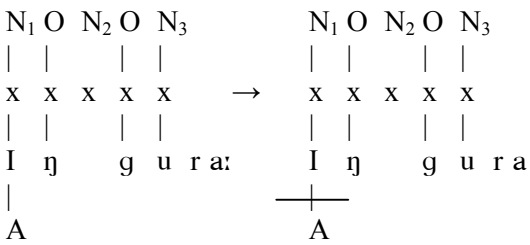
(28) *melis → *mili – 'honey'




Here (A) cannot survive under ($N_1$) because it is not supported by the same prime from ($N_2$). Both (27) and (28) show that in order to survive in a segment headed by another prime, the element (A) has to be doubly linked, i.e. it must occur in two consecutive vowels. This constraint was proposed in (4.3.1.2.) above. (A) is not associated with two slots in (28) and it must be absent from the structure.

Now let us return to the change of [æ] to [ɪ]. Since this time the lax version of the high vowel is used, this is regarded as non-headed (I).

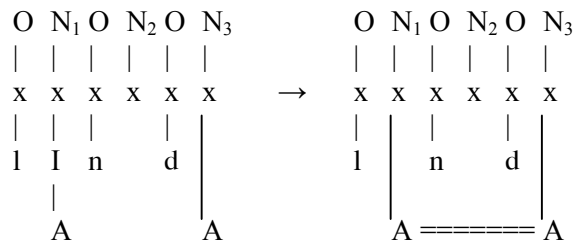
(29) *æŋgura: → *ɪŋgura – 'anchor'




The representations in (29) show that if [ɪ] is headless (I), [æ] should be viewed as headless (A, I) too. There are two reasons for this. First, this [æ] cannot be represented by (I, A) because this structure is realized as [e]. Second, there is no evidence to suspect any headedness in the structure of this segment.

Finally, let us consider the other change involving the vowel [æ], that is, the retraction to [a].

(30) *lænda: → *laNda – 'area'




In (30) the change of [æ] to [a] is illustrated. The prime (I) is attached to ($N_1$) in *lænda:. It is subsequently absent from ($N_1$) when the element (A) is supported (==) by the same prime from ($N_3$). In (27) above we saw A-spreading from the vocalic ending, i.e. *wiso: → *weso – 'knowledge'-gen.sg., and no prime was delinked in the stem vowel after this operation. This showed that (A) can be an operator in an expression headed by another element. Here the situation is different. The reason why (I) is suppressed in *laNda may be that (A), when supported from another position, becomes headed (A). We may also hypothesize that the headed (A) does not license operators.

If we recall the development of *deɣ$^{w}$ih → *dæɣ$^{w}$i → [daɣ$^{i}$] *daig* – 'flame' in (11), we can account for the stem vowel changes in this word in a similar fashion. The form *deɣ$^{w}$ih contains the stem vowel [e] composed of (I, A). When the element (I) loses headship, the vowel is lowered to [æ], whose structure is (A, I), and the form changes to *dæɣ$^{w}$i. The next step is the change of [æ] to [a], which may consist in the shift of status from headless (A) to headed (A). Now, since headed (A) does not license operators, the element (I) is suppressed, as a result of which the form [daɣ$^{i}$] surfaces.

Thus, the disappearance of the prehistoric [æ] from the Irish system can be explained by the assumption that headed (A) does not license operators. This is but a working hypothesis, so no conclusions should be drawn at this stage. It remains to be seen whether this supposition can find confirmation in the other vowels containing (A).

Having analyzed short front vowels in prehistoric alternations, we can propose the following element structures for these vocalic segments in Primitive Irish.

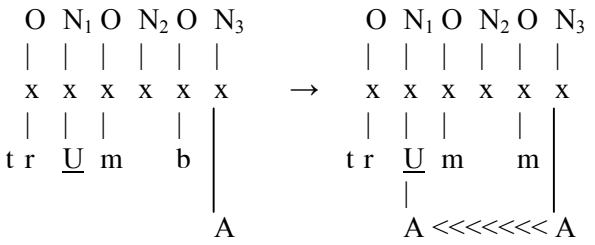
(31)

| | | | | | | |
|---|---|---|---|---|---|---|
| [ɪ] | (I) | obtained from | [æ] | (A, I) | in | *æŋgura: → *ɪŋgura |
| [i] | (I) | obtained from | [e] | (I, A) | in | *melis → *mili |
| [e] | (I, A) | obtained from | [i] | (I) | in | *wisso: → *weso |
| [a] | (A) | obtained from | [æ] | (A, I) | in | *lænda: → *laNda |
| [æ] | (A, I) | was apparently on the wane giving either [ɪ] or [a] | | | | |

*4.3.7.2. The element structures of Primitive Irish back vowels*

Now we are returning to the back vowels so as to examine the element interactions with particular attention paid to the usefulness of the idea of headedness. The forms from (6) and (7), i.e. *trumba → *tromma – 'heavy' and *mori → *muri – 'sea', will serve as examples of lowering and raising, respectively. In other words, we are returning to the alternation of [o – u]. The reconstructed forms provide us with no clue as regards the actual quality of [u]. Nonetheless, taking into account the fact that A-spreading which caused [o – u] alternations was perfectly parallel to that triggering [e – i], changes, we will assume that the vowel [u] is a headed expression. Consider the following representations.

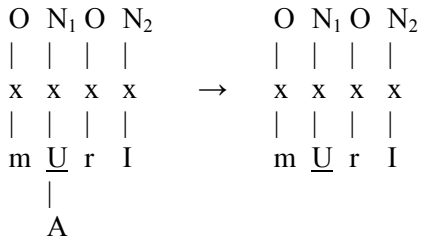
(32)




It is assumed above that in *trumba the vowel [u] under ($N_1$) is represented by (U). In *tromma, where the nucleus ($N_1$) is affected by A-spreading, the resulting [o] has the structure of (U, A). Otherwise, by analogy with the suppression of (I) in *lænda: → *laNda – 'area' in (30) above, we would expect the delinking of (U) under ($N_1$).

Now let us proceed to the example of contextual raising, where the absence of (A) in the ending triggers the transition from [o] to [u].

(33)



In (32), we first observe the form *mori, where the original vowel under ($N_1$) is [o], which consists of (U, A). When there is no support from the vocalic ending ($N_2$), the prime (A) is not licensed by the nucleus ($N_1$), as a result of which the vowel surfaces as [u], with the headed (U), i.e. *muri.

Both the examples in (32) and (33) show that in order for the element (A) to survive in the structure, it has to be doubly linked. This is exactly what we observed in (27-29), i.e. *wisso: → *weso – 'knowledge'-gen.sg. and *melis → *mili – 'honey'. If (A) occurs in the structure and triggers height harmony, it must be linked to two consecutive nuclei. If it is absent from the ending, it is suppressed altogether.[20]

*4.3.7.3. The Primitive Irish* [a]

Finally, let us return to the vowel [a]. In the developments in (4.3.5.3.) we assumed that there were two vowels *a* in Primitive Irish. In Old Irish, the only difference between these two is the ability to alternate. The first type, i.e. let us call it $[a]_1$, either alternates with [au], e.g. [baL]/[bauL] *ball*/*baull* – 'limb'/dat.sg., or is replaced by [u], e.g. [baL]/[buL] *ball*/*bull*, depending on the interpretation. The other Primitive Irish type of *a*, which will be referred to as $[a]_2$, is never affected by the environment in Old Irish, e.g. [mak]/[mak$^{i}$]/[mak] *macc*/*maicc*/*macc* – 'boy'/gen.sg./dat.sg. Nor was it able to alternate in Primitive Irish, e.g. *mak$^{w}$k$^{w}$ah → [mak], *mak$^{w}$k$^{w}$i → [mak$^{i}$], *mak$^{w}$k$^{w}$u → [mak].

In (4.3.7.1.) it was also hypothesized that the Primitive Irish vowel [a] which resulted from the retraction from [æ], e.g. *lænda: → *laNda – 'area', should be represented by the headed prime (A). Being headed, the prime (A) could not license operators and the element (I) in the form *lænda: had to be suppressed. The presumed development was as follows: acquisition of headedness (A, I) → (A, I), element decomposition (A, I) → (A), and hence the retraction of [æ] to [a]. Given this structure of [a], let us see whether this element representation can be confirmed in the analysis of the vowels $[a]_1$ and $[a]_2$.

The first type, that is the Primitive Irish $[a]_1$, developed from the ancient [ɒ]. As proposed in (21), the original [ɒ] was reinterpreted in two ways in Primitive Irish: either as [a], e.g. *k$^{w}$rɒnnan → *kraNa → [kraN] *crann* – 'tree', or as [o], which led to the regular [o – u] alternation and the Old Irish form *k$^{w}$rɒnnu: → *k$^{w}$ronnu: → *kruNu → [kruN] *crunn* – 'tree'-dat.sg. (for the sake of clarity, we ignore here the alternative variant of the dative, which is *craunn*).

[20] This resembles Finnish Vowel Harmony (Kaye 2001:259ff.). In Finnish, "if a nuclear expression in a phonological domain contains (I) as an operator, the element (I) must be present (as head or operator) in every nuclear expression in the phonological domain".

In terms of the element make-up, we assumed that the change of [ɒ] to [a] in *k$^{w}$rɒnnan → *kraNa can be represented as (A, U) → (A). As regards the development of [ɒ] to [o] in *k$^{w}$rɒnnu: → *k$^{w}$ronnu:, the structural change involved the shift of headship, i.e. (A, U) → (A, U). The subsequent raising to [u], i.e. *k$^{w}$ronnu: → *kruNu, and the origin of [kruN] *crunn* – 'tree'-dat.sg. parallels that observed in *mori → *muri → [mur$^{i}$] *muir*– 'sea' in (33) and entails the loss of (A), i.e. (A, U) → (U). Thus, the vowel [a]$_1$, which developed from [ɒ], e.g. *k$^{w}$rɒnnan → *kraNa – 'tree', can be said to have the same element make-up as [a] which originated from [æ] in *lænda: → *laNda – 'area'.

Let us now turn to the non-alternating Primitive Irish vowel [a]$_2$, which originated from the Proto-Celtic [a], e.g. *mak$^{w}$k$^{w}$os → *mak$^{w}$k$^{w}$ah → [mak] *macc* – 'boy'. The nom.sg. shows that in the Primitive Irish *mak$^{w}$k$^{w}$ah the prime (A) in the stressed stem vowel was supported by (A) in the vocalic ending. However, the gen.sg. *mak$^{w}$k$^{w}$i → [mak$^{i}$], and the dat.sg. *mak$^{w}$k$^{w}$u → [mak] reveal that there was no (A) in the endings of these forms to support the same prime in the left-hand nucleus. Thus, being linked to only one nucleus, the prime (A) should have been removed from the structure. No such development took place, though, and (A) survived in both the gen.sg. and dat.sg. without double linking.

A possible solution to this puzzle may come from the development of Primitive Irish tense sonorants, i.e. [r] → [R], [l] → [L], and [n] → [N]. As proposed in (2.3.6.), the original lax sonorants, e.g. [r], were first geminated in specified phonological contexts, i.e. they were linked to two positions on word-boundaries. This resulted in their tensing, e.g. *ehja:h la:ṽa: → *ehja:lla:ṽa: → *eja: **L**a:ṽa: – 'her hand'. Later on, in context-independent position, tense sonorants replaced the lax ones, e.g. *la:ṽa: → ***L**a:ṽa: – 'hand'. It was proposed that the acquisition of headedness was equal to double linking.

Therefore, if we assume that headedness in vowels has the same effect as double linking, then the element (A) survived in, say, *wiso: → *weso – 'knowledge'-gen.sg., due to double linking, while it may have managed to remain in the structure of *mak$^{w}$k$^{w}$i – 'boy'-gen.sg. as a result of being headed. Thus, the vowel [a]$_2$ in [mak] *macc* – 'boy' should be represented (A), similarly to all vowels [a] in Primitive Irish. The vowel [a] in *mak$^{w}$k$^{w}$i may have also survived simply because there was no I-spreading and, if [a] were delinked, nothing would have remained in the nucleus.

### *4.3.7.4. The Primitive Irish non-alternating* [e] *and* [o]

Assuming that the element (A) can survive in the stem vowel without support only thanks to being headed, i.e. (A), we can finally turn to the other two non-alternating vowels, i.e. [e] and [o]. Consider again the stable *e*'s and *o*'s.

| (34) NOMINATIVE | GENITIVE | DATIVE | |
|---|---|---|---|
| a. ***non-alternating*** [e] | | | |
| [L$^{i}$eθ] *leth* | [L$^{i}$eθ$^{i}$] *leith* | [L$^{i}$eθ] *leuth* | – 'half' |
| [m$^{i}$es] *mes(s)* | [m$^{i}$eso] *mes(s)o* | [m$^{i}$es] *mes(s)* | – 'judgement' |
| b. ***non-alternating*** [o] | | | |
| [korp] *corp* | [kor$^{i}$p$^{i}$] *coirp* | [korp] *corp* | – 'body' |
| [foLt] *folt* | [foL$^{i}$t$^{i}$] *foilt* | [foLt] *folt* | – 'hair' |

Lets us recall that these cases are exceptions to the regular alternations of [i – e], e.g. [f$^{i}$er]/[f$^{i}$ir$^{i}$]/[f$^{i}$ir] – 'man'/gen.sg./dat.sg. and [o – u], e.g. [kloθ]/[kluθ$^{i}$]/[kluθ] – 'fame'/gen.sg./dat.sg.

The words in (34) belong to two different declensions. For this reason they should display alternations in different paradigmatic cases. In particular, in (34a) the word for 'half' should display the vowel [i] in the genitive and dative. In the word for 'judgement' the vowel [i] ought to surface in both the nominative and dative, the genitive being a classic example of vowel harmony. In (34b) the words for 'body' and hair' should display the vowel [u] in both the genitive and dative, which they actually do in the alternative [kur$^{i}$p$^{i}$] *cuirp*, [fuL$^{i}$t$^{i}$] *fuilt* as well as [kurp] *curp*, [fuLt] *fult*, respectively. Nonetheless, the forms with [o] are regarded as perfectly licit and we need to account for them too.

Thus, we have two non-alternating vowels, both containing the prime (A). It was shown in the previous sections that the prime (A) is an operator responsible for vocalic alternations in Primitive Irish, e.g. *wisoː → *weso – 'knowledge'-gen.sg., *æŋguraː → *ɪŋgura – 'anchor', etc. If (A) is attached to two consecutive nuclei, the vowels in the harmonic span are mid ones. If it is not doubly linked, it must be deleted, e.g. *mori → *muri – 'sea'. If it is not deleted, it must be headed, e.g. *mak$^{w}$k$^{w}$iː → *mak$^{w}$k$^{w}$i – 'boy'-gen.sg.

Given the examples in (34a, b), we must conclude that the non-alternating vowels [e] and [o] in, e.g. [L$^{i}$eθ] *leth* vs. [L$^{i}$eθ$^{i}$] *leith* vs. [L$^{i}$eθ] *leuth* – 'half'/ gen.sg./dat.sg. and [korp] *corp* vs. [kor$^{i}$p$^{i}$] *coirp* vs. [korp] *corp* – 'body'/gen. sg./dat.sg., respectively, are headed by the element (A). In particular, the non-alternating [e] equals (A, I), while the stable [o] is represented by (A, U).

The different status of (A) in alternating and stable vowels probably means a slight change in the quality of these vowels. In particular, the vowel *e* in *messu could have differed from that in *fera, e.g. [m$^{i}$ɛsu] vs. [f$^{i}$era]. In terms of elements the difference may be between (A, I) and (A, I), respectively. Similarly, the vowel *o* in *korpa and *klotha, that is [kɔrpa] (A, U) vs. [kloθa] (A, U).

These proposals run into difficulty with what we postulated above, namely that headed (A) does not license operators. This was a hypothetical statement

used to explain the suppression of the element (I) in the development of forms such as *deɣ$^{w}$ih → *dæɣ$^{w}$i → [daɣ$^{i}$] *daig* – 'flame'. However, given the discussion concerning the behaviour of non-alternating vowels, we must redefine the cause of the delinking of (I) in words of this type.

Since the element (I) was the head of [e] in *deɣ$^{w}$ih, then it became an operator in [æ] of *dæɣ$^{w}$i, it is likely that it finally disappeared from the stem vowel without any intervention from (A). This account is hardly scientific but, since the lowering of [e] to [æ] occurred without any locally present cause, we may suspect that the loss of (I) was a gradual process which occurred for systemic rather than phonological reasons.

*4.3.7.5. Element representations of vowels*

We are now in a position to propose a complete picture of Primitive Irish short vowels which either alternated or remained immune to the environment:

| (35) | PRIMITIVE IRISH | | | OLD IRISH | |
|---|---|---|---|---|---|
| [ɪ] (I) < | [æ] (A, I) | *æŋguraː | → *ɪŋgura | [iŋgər] *ingor* | – 'anchor' |
| [i] (I) < | [e] (I, A) | *melis | → *mili | [m$^{i}$il$^{i}$] *mil* | – 'honey' |
| [e] (I, A) < | [i] (I) | *wissoː | → *weso | [f$^{i}$eso] *feso* | – 'knowledge'-gen. |
| [ɛ] (A, I) < | stable | *mɛssu | | [m$^{i}$es] *mes* | – 'judgement'-dat. |
| [a] (A) < | [æ] (A, I) | *lændaː | → *laNda | [LaNd] *land* | – 'area' |
| (A) | stable | *maku | | [mak] *macc* | – 'boy'-dat. |
| (A) < | [ɒ] (A, U) | *bɒlla | → *baLa | [baL] *ball* | – 'limb' |
| [o] (A, U)< | [u] (U) | *kluta | → *kloθa | [kloθ] *cloth* | – 'fame' |
| [ɔ] (A, U) | stable | *foltu ? | | [foLt] *folt* | – 'hair'-dat. |
| [u] (U) < | [o] | *mori | → *muri | [mur$^{i}$] *muir* | – 'sea' |

Two things should be mentioned here. First, the vowels [æ] and [ɒ] are not included in the left-hand column in (35). The reason why they are omitted is that they were part of an earlier inventory which gave way to the one shown in (35). Second, this collection of segments along with their element structures represent the inventory which took part in purely phonological vocalic alternations. These changes occurred when the Irish words still had vocalic endings, that is, in Primitive Irish. It can be seen in the right-hand column that the Old Irish versions of words participating in these alternations do not display different *e*'s, *i*'s, *o*'s or *a*'s. The reason why this is so is that there is absolutely no evidence that there were dissimilar segments of these types in this system. We have seen that at the time of phonological alternations the vowels must have differed and one of the ways of depicting these differences is attributing diverse element structures

to them. In Old Irish, when there was no longer any context for phonological alternations, levelling must have occurred and all the dissimilar *i*'s, *o*'s and *e*'s merged as identical segments [i], [e] and [o], respectively. Their synchronic behaviour provides no convincing evidence to the contrary because the Old Irish alternations were morphophonological: they still observed the principles which had been followed in specific phonological contexts even though these contexts were no longer available. Thus, the Old Irish inventory of short vowels may be schematized in this fashion:

(36) [i] (I) or (I)
[e] (A, I) or (A, I) or (A, I)
[a] (A) or (A)
[o] (A, U) or (A, U) or (A, U)
[u] (U) or (U)

The structures of the Old Irish short vowels cannot be established beyond doubt because these segments are merely a reflection of past phonological processes. It is impossible to state when exactly levelling occurred but Old Irish seems to be a transition period between past processes and the system of Middle Irish, which simplified many forms and introduced new methods of expressing differences between paradigmatic cases of lexical items. The most significant ways were the emphasis placed on the syntactic behaviour of paradigmatic cases and the growing importance of palatalization. These devices took over the role of prehistoric endings which were morphological exponents of contrast.

### *4.3.8. Vowels in stressed syllables and vocalic alternations – summary*

In the first part of this chapter the behaviour of short vowels in stressed syllables, vocalic alternations and non-alternating vowels have been analyzed. The main conclusion is that short vowel alternations in Old Irish do not meet the basic condition which is necessary to name these vocalic changes phonological. There is simply no context for phonological change in the system of Old Irish viewed from the synchronic perspective. This is strictly connected with the inability to find sufficient evidence supporting the belief that there were three types of consonant qualities in Old Irish. In Thurneysen's (1946) view, where three consonant qualities are recognized, the context for alternations can be identified but, since the spelling conventions were highly inconsistent, there is no proof that three qualities were present in Old Irish. In Greene's (1976) and McCone's (1996) approaches, where two qualities are advocated, vocalic alternations do occur, but the context for phonological change is absent. If we recall the word

for ‘man’, i.e. [fʲer] *fer*, its genitive [fʲirʲ] *fir* and dative [fʲiur] *fiur*, and adopt McCone’s recognition of the diphthong [iu] as well as the broad quality of the final liquid in the dative, the context is identical in the nominative and dative, and yet the vocalic segments differ in these cases. According to the definition of alternation where the context is the trigger of changes, we cannot expect different changes in the same context. Thus, whether or not we recognize three short *u*-diphthongs is systemically irrelevant because there is no third quality anyway.

Therefore, our discussion was limited to pursuing phonological alternations in the system of Primitive Irish, where the context was invariably present and vocalic changes duly occurred. As a result, an inventory of Primitive Irish short vowels was proposed as one in which alternations took place, while the Old Irish system was described as one in which nothing results from the synchronic context. If we recall the definition of morphophonology (e.g. Árnason (1985), Cyran (2003)), according to which phonological regularities are grammaticalized or petrified and the synchronic effects may reflect past rather than present phonological patterns, the phenomenon of Old Irish vowel alternations can by all means be called morphophonological. In the light of this statement, purely synchronic analyses of Modern Irish vowel alternations may appear slightly out of place.

### 4.4. Word-medial vowels in unstressed syllables

In this part of the present chapter we will inspect the behaviour of short vowels in unstressed syllables. It is vital to state at the very outset that we will concentrate on vocalic segments in the interior of words, e.g. the second vowel in the word [klaðʲəv] *claideb* – ‘sword’, but not on the final vowel in, say, [fʲiru] *firu* – ‘man’-acc.pl. The reason for this choice is very trivial: the vocalic endings were discussed while dealing with short vowels in stressed syllables and nothing more can be said about them. There is relative concord among the scholars that these endings are never reduced and the orthographic symbols represent the actual vowels. Word-medial ones, in contrast, present a few problems concerned with both their actual phonetic shape and the qualities of the flanking consonants.

It is also essential to determine the status of the vowels we are about to discuss. They almost invariably alternate with zero if there is a vowel in the following syllable, e.g. [inʲisʲ]/[inʲsʲe] *inis*/*inse* – ‘island’/gen.sg. In GP every vowel alternating with zero is treated as an underlying empty nucleus. Thus, the majority of cases described below will include underlyingly empty nuclear positions.

As stated in the introduction, the word-medial vocalic segments in unstressed syllables are represented by the same symbols as the stressed vowels, that is *i*, *e*, *a*, *o*, *u*. At first glance, it might appear that these orthographic symbols denoted five different realizations of unstressed vowels, which is implied in Thurneysen

(1946:63ff.). However, the more contemporary relevant literature offers a range of arguments disfavouring this view. Two most important ones are as follows. First, since primary stress was always initial in Old Irish, the medial position of these vowels was ideal for their reduction to schwa (Lewis and Pedersen 1974: 70ff.; McCone 1996:33ff.), e.g. [molað] → [molәð] *molad* – 'praise'. Second, many of these vowels appeared in Early Old Irish as a kind of compensation for Primitive Irish apocope, which left 'clumsy' clusters at the end of the word, e.g. *do͡vna → (apocope) *do͡vn → (svarabhakti) [do͡vun] *domun* – 'world', or syncope, which deleted any second vowel of the polysyllabic word and produced unpronounceable clusters word-medially, e.g. *evraθ$^{i}$i → (syncope) *evrθ$^{i}$i → (anaptyxis) [evәr$^{i}$θ$^{i}$i] *ebarthi* – 'will give it' (McCone 1996:127). These vowels were coloured according to the qualities of the flanking consonants, so they were 'raw vocalic material' which was filled with melody. Most likely these empty nuclei were simply voiced to schwa but in different contexts they may have initially taken on dissimilar phonetic shapes. It is difficult to state when exactly all unstressed vowels started to be realized as schwa, as they are in Middle and Modern Irish, but we will try to discover whether their pronunciation as schwa or non-schwa had any significance in the Old Irish period.

### *4.4.1. Approaches to the shape of vowels in unstressed syllables*

#### *4.4.1.1. Vowels in unstressed syllables – traditional view*

In this section the traditional view of what vowels in unstressed syllables were like will be presented. Thurneysen (1946:63ff.), who recognizes three consonant qualities for the existence of which we have not found sufficient evidence as yet, offers the following account of the distribution of these vowels. Although he does not make a claim as regards the pronunciation of these segments, it is implied that there were five dissimilar realizations of word-medial short vowels:

| (37) | ***Context*** | ***Spelling*** | ***Example*** | ***Gloss*** | ***Possible Pronunciation*** |
|---|---|---|---|---|---|
| a. | $C^{i}$ _ $C^{i}$ | *i*, seldom *e* | *ber**i**d* | – '(he) bears' | [i] |
| b. | $C^{i}$ _ $C^{a}$ | *e* | *sess**e**d* | – 'sixth' | [e] |
| c. | $C^{i}$ _ $C^{u}$ | *iu*, *i* | *imn**iu**d* | – 'suffering'-dat. | [i] |
| d. | $C^{a}$ _ $C^{a}$ | *a* | *apst**a**l* | – 'apostle' | [a] |
| e. | $C^{a}$ _ $C^{i}$ | *ai,* seldom *i* | *fod**ai**l* | – 'share' | [i] [a] |
| f. | $C^{a}$ _ $C^{u}$ | *u*, *o* | *den**o**m*/*-**u**m* | – 'doing' | [u] [o] |
| g. | $C^{u}$ _ $C^{u}$ | *u* | *il**u**r* | – 'great number' | [u] |
| h. | $C^{u}$ _ $C^{i}$ | *i*, *ui* | *cosm**i**l*/*-**ui**l* | – 'like' | [i] [u] |
| i. | $C^{u}$ _ $C^{a}$ | *u*, *o* | *flech**u**d*/*-**o**d* | – 'rainy weather' | [u] [o] |

If the spelling can be indicative of the pronunciation, which it must be to some extent when we are dealing with a dead language, the frequency of occurrence of some orthographic symbols points to some revealing conclusions. In particular, the contexts in which the consonant preceding the unstressed vowels is slender (37a-c) display the same letters as those found in stressed syllables, e.g. *sess**e**d* is comparable to *f**e**r*, while *imn**i**u**d* to *f**i**u**r*. Moreover, vowels between the consonants of the same broad qualities come up to our expectations as well; that is *apst**a**l* in (37d) resembles *m**a**cc*, whereas *il**u**r* in (37g) is comparable to *s**u**n*. However, the remaining four contexts, that is (37e, f, h, i), do not generally reflect the same pattern as that discussed in the first part of this chapter. There are some similarities in that one variant parallels that in the stressed syllable, e.g. *cosm**ui**l* in (37h) could be like *s**ui**n*, but other spellings such as *cosm**i**l* or even *cosm**ai**l* distort the picture and cast a shadow of a doubt on the actual shape of this vocalic segment.

As already mentioned, this distribution is based on the assumption that there are three consonant qualities although Thurneysen (1946:109) admits that the two non-palatalized qualities were frequently indistinguishable and that the levelling began very early in Old Irish. In the ensuing section we will examine another approach to the quality of vowels in unstressed syllables.

### *4.4.1.2. A modern approach to unstressed vowels*

The fivefold distinction among the vowels in unstressed syllables is contested by McCone (1996:135) who claims that four word-medial vocalic segments, that is those represented by the letters *i*, *e*, *a*, *o* or digraphs indicating palatalization or non-palatalization of the flanking consonants (e.g. *ai*), were schwa-like objects. These segments, in his opinion, were phonemically schwas but the qualities of the flanking consonants provided them with appropriate colouring, thus making them contextual allophones. The only vowel which was pronounced according to the spelling was [u] which, due to the fact that *u*-quality is not recognized in his approach, could not have received the colouring from the neighbouring consonantal sounds. McCone's claim is also based on the assumption that there was no need to express any contrast between the unstressed vowels apart from that between [ə] and [u], which he exemplifies by [as ˈRuvuRt] *as:ruburt* – 'I have said' vs. [as ˈRuvəRt] *as:rubart* – 'he has said' and [fɔrməd]/[formud] *format*/*formut* – 'jealousy'/dat.sg. These resemble the alternation of the *crann*/*crunn* type which we discussed above. Thus, viewed from McCone's perspective, all the cases from (37a, b, d, e, f) contain the phonemically distinct sounds [ə], whatever their phonetic realization is, the examples from (37c, g) display [u], while those in (37h, i) are dubious, but they are likely to have [u] as well.

This treatment of unstressed vowels logically follows from the recognition of short *u*-diphthongs in stressed syllables, as proposed by Greene (1976), and the distinction between, for example, [fʲirʲ]/[fʲiur] *fir/fiur* – 'man'-gen.sg./dat.sg., a difference which we have shown to be unnecessary given that the palatalized [r] of the genitive is sufficiently distinctive, that is [fʲirʲ]/[fʲir]. It should also be recalled here that, apart from the morphological dissimilarity, paradigmatic cases are in syntactic complementary distribution, which greatly diminishes the necessity for minimal-pair contrast. The example of verbal forms is more convincing because contrast should be more explicit there. For instance, the verbal form for 'I slaughter' should phonetically differ from that for 'you slaughter', etc. Nonetheless, Old Irish has a number of verbal forms which do display identical forms for dissimilar persons, e.g. [do ˈgʲnʲiː] *do:gní* stands for both the second and the third persons singular of the verb 'to do' in the present tense.

Another interesting argument in favour of treating [u] as a non-reducible-to-schwa segment comes from the prehistory of Irish. While discussing *u*-infection, which perhaps created short *u*-diphthongs in stressed syllables, in (4.3.5.1.-4.3.5.3.) above, we disfavoured the idea that the symbol *u* stood for a phonological object in, e.g. [fʲir] *fiur* – 'man'-dat.sg. However, Greene (1976:30) and Mc Cone (1996:112) provide examples of *u*-infection which was a more powerful type of umlaut in unstressed syllables. Therefore, although there was probably no visible umlaut in many stressed nuclei, e.g. *messuh → *messu → [mʲes] *mess* – 'judgement', *u*-infection may have been fairly strong in recessive nuclei, e.g. *to͡vessuh → *to͡veusu → [to͡vus] *tomus* – 'measurement' and *doressuh → *doreusu → [dorus] *dorus* – 'door'. The same goes for the synchronic and diachronic contrast between deuterotonic (independent) and prototonic (dependent) verbal forms, e.g. *eks-beruː → *eχs-biru → *es-bi(u)ru → [as ˈbʲiur] or [as ˈbʲir] *as:biur* (deut.) vs. *eks-beruː → *eχs-beruː → *eɣ-beuru → *eburu → [ebur] *:epur* (prot.) – 'I say'.

These cases suggest that *u*-infection was an important prehistoric process which may constitute a counterbalance to palatalization. In particular, palatalization affected non-initial consonants, i.e. these which were exponents of contrast by being either slender or broad, e.g. [aθərʲ] *athair* vs. [aθər] *athar* – 'father'/gen.sg., while *u*-infection took care of unstressed vowels, i.e. when there was no difference between non-palatalized consonants, the vowels [u] and [ə] were the only markers of contrast, e.g. [formə̆d] *format* vs. [formud] *formut* – 'jealousy'/dat.sg. (see also Greene 1973). It goes without saying, then, that *u*-infection was an important part of the Primitive Irish phonological system. However, whether the dissimilarity between [u] and [ə] was still present in Old Irish is a different question. Solutions to this and other issues will be sought in the ensuing section.

*4.4.1.3. Problems with approaches to unstressed vowels*

Both the traditional and the modern approaches to the issue of quality in the case of unstressed vowels have their advantages. There are a few problems with each, however, because both are phonemic and both aim to prove that, one way or another, there was explicit contrast between word forms which did not differ with respect to the palatalization vs. broadness of non-initial consonants, e.g. *claide**b*** vs. *claidiu**b*** – 'sword'/dat.sg. Thurneysen (1946) would probably transcribe this pair as [klað$^{i}$ev$^{a}$] vs. [klað$^{i}$iv$^{u}$], while McCone (1996) would undoubtedly propose the distinction between [klað$^{i}$əv] and [klað$^{i}$uv], respectively.

In Thurneysen's (1946) view there was probably a fivefold opposition among the word-internal unstressed vowels, although there was no need for such a complicated distinction in a system which had already mastered the palatalized vs. non-palatalized dichotomy as regards the non-initial consonants. Moreover, it is clear given the collection in (37) that in many cases the broad quality of the consonant can be marked by either *a* or *u*, apparently with no difference to the possible pronunciation, e.g. *cosm**u**il* vs. *cosm**a**il*. This is another argument disfavouring three consonant qualities and proving that palatalization of consonants was a satisfactory marker of contrast. A difficulty may be said to arise with the forms in (37f, i), where the distinction between the two broad qualities should be denoted. However, this problem may also be apparent. If we recall cases like [mak] *macc* – 'boy'-nom.sg./dat.sg. (both forms identical), it is evident that there are words in which no visible contrast is expressed and it is only the syntactic behaviour of a given form that is indicative of the paradigmatic case. In unstressed syllables we find fluctuations like that in [d$^{i}$ev̆$^{a}$on$^{u}$] *demon* vs. [d$^{i}$ev̆$^{u}$un$^{u}$] *demun* – 'devil'-nom.sg., the dative being either of these, or even *demain*, while the genitive is usually *demuin*. These facts indicate that if contrast is to be expressed, it is marked by the quality of the consonant, but if it cannot, it is not displayed because the language has other means of showing which case we are faced with, and these means are primarily syntactic.

If we now turn to the modern approach, where the slender vs. broad consonant distinction is advocated by McCone (1996), it is clearly more economical in the treatment of oppositions among unstressed vowels. The idea of prehistoric *u*-infection of these vowels is fairly convincing and the maintenance of [u] in cases like [formǝd]/[formud] *format*/*formut* – 'jealousy'/dat.sg. is logical given that any other distinctions are taken care of by the slender vs. broad consonants.

However, it is not clear whether the treatment of the orthographic medial *u* as [u], stemming from the prehistoric development, can be extended to cases like *domun* quoted above. Let us recall the relevant details: *duv̆nah → (vowel lowering) *dov̆na → (apocope) *dov̆n → (svarabhakti) [dov̆un] *domun* – 'world'.

Given that *u*-infection was a Primitive Irish development, while the second vowel in *domun* was a result of epenthesis occurring in Early Old Irish, we may have doubts about the significance of the latter process and the consequent treatment of the epenthetic vowel. Interestingly, the *u*-symbol did not appear in the vicinity of historically *u*-infected consonants, but in the neighbourhood of labials (almost exclusively). Thus, should the second vowel in *domun* be like that in *tomus*? Besides, the non-reduction of *u* to schwa in cases like *domun* and *tomus* would serve no purpose since the only information it carries is that the surrounding vowels are broad. The other paradigmatic cases where distinction occurs at all may be syncopated, e.g. [to͡vus] *tomus* vs. [to͡vsʲo] *toimseo* – 'measurement'/gen.sg., or the difference is rendered by the palatalization of the final consonant, e.g. [do͡vun] *domun* vs. [do͡vunʲ] *domuin* – 'world'/gen.sg. Thus, any schwa vowel could serve the same purpose. Given that spellings like *domon* and *doman* are attested for the nom.sg., as well as *domain* for the gen.sg., we can say that the phonetic quality of the unstressed vowel was totally unimportant. Interestingly, the gen.sg. form is a secondary formation. The regular development of *du͡vniː → *du͡vniː, which should have produced the regular Old Irish genitive *[du͡vənʲ], was abandoned in favour of [do͡vunʲ] *domuin*, where the stem vowel was replaced by analogy with the nom.sg. and acc.sg. [do͡vun].

The disparity between the relevant persons in the historically *u*-infected verb [as ˈbʲiur] or [as ˈbʲir] *as:biur* – 'I say' can successfully be rendered by consonant quality in the stressed syllables, that is [as ˈbʲirʲ] *as:bir* – 'you say', or by vowel quality, that is [as ˈbʲerʲ] *as:beir* – 'he says'. As a result, no *iu* diphthong is needed for the first person to indicate contrast. This is what we established while dealing with the hypothetical *u*-diphthongs in, say, [fʲirʲ]/[fʲir] *fir*/*fiur* – 'man'-gen.sg./dat.sg. The unstressed vowels in prototonic variants of this verb need not be distinct either; the first person singular prototonic does not have to be [ebur] *:epur* to be sufficiently contrasted with the palatalized consonant in [ebirʲ] *:epir* in the second and third persons singular (identical). The reduced [ebər] for *:epur* seems a satisfactory differentiation, while the vowel [i] in [ebirʲ] *:epir* is a phonetic effect (i.e. a coloured schwa).

At any rate, the idea that there was any distinction between only two separate vocalic segments in unstressed syllables is more likely than that according to which five dissimilar objects were involved in the opposition, if there was any vocalic opposition at all. We concluded in (4.3.2.2.) that Old Irish was a system in which vowel distinction was in the process of being shifted to consonant opposition, that is, the division into slender and broad consonants. Moreover, cases like *format*/*formut*, which so far seem the only problematic examples, are extremely rare as regards the whole system and it is not clear whether they should constitute a debatable issue.

Therefore, given that a traditional examination cannot be helpful, an analysis from the viewpoint of the Theory of Elements will be conducted below with a view to discovering whether there was any contrast among the unstressed vowels and whether it was vital to display any distinction among nuclei in this position.

### *4.4.2. A GP analysis of word-medial unstressed vowels*

At the beginning of this section let us recapitulate what we established as regards the behaviour of resonance elements in stressed vowels. We found no proof that there were three consonant qualities, nor did we find enough evidence to recognize the short *u*-diphthongs. We discovered that regularly alternating vowels in stressed syllables, such as [e – i] and [o – u] displayed different shapes according to the prehistoric vowel harmony and that some apparently regular alternations, like [a – u], were triggered by different reinterpretations of some vocalic segments in prehistory. Another alternation, that is [a – e], was caused by non-phonological factors. Moreover, it has been claimed that leftward spreading of the prime (A) was present in prehistory, while the spreading of the other two resonance elements, that is (I) and (U), was not detected. To sum up, the Old Irish vocalic alternations reflected the prehistoric phonological processes and were synchronically morphophonological.

Now it is time we turned to the unstressed vowels. The spelling of medial unstressed vowels to a great extent parallels that used to represent vocalic segments in stressed syllables. This may be indicative of the fact that in prehistory both stressed and unstressed vowels underwent similar harmonic changes.

Let us consider the development of the word for ‘sword’, which is comparable to the history of *fer* – ‘man’ illustrated in (13) and repeated here for convenience. Below we also propose phonetic transcriptions of the unstressed vowels:

| (38) | ***Stage I*** | ***Stage II*** | ***Old Irish*** | |
|---|---|---|---|---|
| a. | *wirah | → *wera | → [fʲer] *fer* | NOMINATIVE SG. |
| | *klaðⁱivah | → *klaðⁱeva | → [klaðʲəv] *claideb* | |
| b. | *wirⁱiː | → *wirⁱi | → [fʲirⁱ] *fir* | GENITIVE SG. |
| | *klaðⁱiviː | → *klaðⁱivⁱi | → [klaðʲivⁱ] *claidib* | |
| c. | *wiruː | → *wiru | → [fʲir] *fiur* | DATIVE SG. |
| | *klaðⁱivuː | → *klaðⁱivu | → [klaðʲəv] *claidiub* | |

In (38) we can observe the phenomenon of vowel harmony taking place at Stage II. As a result of the spreading of the element (A) from the nominative ending in (38a), the original penultimate vowel [i] was lowered to [e]. Here the prime (A)

harmonized by being linked to two consecutive nuclei. In neither (38b) nor (38c) did lowering occur at Stage II because the endings contained high vowels. Let us note that the vowel [a] did not change at Stage II in either genitive or dative because it was represented by the headed (A). After apocope, which prefaced Old Irish, the vocalic endings were lost, while in Old Irish the unstressed vowels were most likely (phonetically) reduced to schwas. In terms of phonology, we may even assume for the time being, that these nuclei were reinterpreted as empty, i.e. ones which can be properly governed if followed by another vowel.[21]

Now let us focus on the differences between the paradigmatic forms of the two words in (38). If we accept the view that neither the diphthong *iu* (McCone 1996) in the dative nor the three consonant qualities (Thurneysen 1946) should be recognized, the situation in the paradigmatic cases of the word for 'man' is fine: each case is different either due to the vowel quality, i.e. [fʲer] vs. [fʲirʲ] and [fʲir], or the palatalized vs. broad final consonant, i.e. [fʲirʲ] vs. [fʲir] and [fʲer]. In the word for 'sword' an additional factor must be taken into account, namely the vowel reduction in the unstressed syllables. As assumed above, these reduced vowels are underlyingly empty nuclei. In (38a) the empty nucleus can be represented as schwa, i.e. [klaðʲəv] *claideb*, which seems uncontroversial. It is proposed in (38b) that the empty nuclear position in the genitive should be transcribed as [i], i.e. [klaðʲivʲ] *claidib*. This results from the fact that unlicensed empty nuclei between two palatalized vowels must be phonetically realized as [i]. This is the case in Modern Irish, for example. As for the dative, we can argue that the empty nucleus should be viewed as schwa as well, i.e. [klaðʲəv] *claidiub*. The reason why this form is identical to the nominative singular is simple: there is no need for contrast between the nominative and the dative of the same lexical item since these two paradigmatic cases can never be confused in a syntactic context.

The fact that a nuclear point becomes underlyingly empty at a certain stage in the development of the language may, but need not be accidental. In the case of Irish, some of the Insular Celtic full vowels were reinterpreted as empty nuclei in Primitive Irish, after the process of apocope. Given that stress was already initial, and that every other syllable was weakly stressed in long words, the second (and the fourth) nucleus of the word became the target of Proper Government. Consider the detailed developments of the two cases of the word for 'sword', namely nominative singular and dative plural. The latter form was syncopated in late Primitive Irish. The second vowel in each word (the target of Primitive Irish syncope or Proper Government) is emboldened.

[21] In Chapter Three we adopted the view that some empty nuclei are 'buried', i.e. phonologically irrelevant, while others are 'unburied', i.e. phonologically valid. Here the term 'empty nucleus' is used with reference to 'unburied' empty positions.

(39) a. NOMINATIVE SINGULAR

*kladibos → (Proto-Celtic lenition) *klaðivos → (Insular Celtic weakening) *klaðivah → (Primitive Irish vowel harmony) *klaðʲevah → (Primitive Irish *h*-dropping) *klaðʲeva→ (Primitive Irish apocope) *klaðʲev → [klaðʲəv] *claideb*

b. DATIVE PLURAL

*kladibobis → (Proto-Celtic lenition) *klaðivovis → (Insular Celtic weakening) *klaðivovih → (Primitive Irish vowel harmony) *klaðʲevovʲih → (Primitive Irish *h*-dropping) *klaðʲevovʲi → (Primitive Irish apocope) *klaðʲevovʲ → (Primitive Irish syncope) *klaðʲvʲovʲ → [klaðʲvʲivʲ] *claidbib*

Consonant lenitions apart, the original vowel [i] was raised to [e] due to Primitive Irish vowel harmony (A-spreading from the end of the word) in both the cases. After the periods of *h*-dropping and apocope this [e] was deleted by syncope only in the dat.pl., i.e. *klaðʲevovʲ → *klaðʲvʲovʲ. The vowel [e] in the nom.sg. *klaðʲev was apparently an empty nuclear position at that time too but syncope could not affect it: there was no longer a following vowel in this form. Hypothetically, if the Proto-Celtic form of the nom.sg. had been *kladibo:s, the whole chronological derivation would have produced the non-existent syncopated *[klaðva]. This was not the case and the empty or 'properly governable' second nucleus of the original *kladibos never underwent syncope.

However, it is conceivable that the reduced vowels in the non-syncopated forms were not underlying empty nuclei. Given that they had been full vowels until late Primitive Irish and were never deleted afterwards, they may be viewed as vowels reduced to schwas only. In particular, the second vowel in the dat.pl. *klaðʲevovʲ → *klaðʲvʲovʲ became a target of Proper Government because the phonological system of late Primitive Irish was undergoing syncope. Thus, every second vowel in words which were at least trisyllabic was marked as properly governable. In other words, it underwent a shift of status from a vowel to an underlying empty nucleus. On the other hand, the second vowel in *klaðʲev (nom. sg.) did not change formally at that time because syncope did not apply to disyllabic words. Thus, it was still composed of (A, I), similarly to that in [fʲer] *fer* – 'man', but the recessive position of the second nucleus in [klaðʲəv] 'muffled' the acoustic properties provided by these elements. The same goes for the forms of the gen.sg., i.e. *klaðʲivʲ, and the dat.sg., i.e. *klaðʲiv or *klaðʲiuv. These nuclei survived until Old Irish and this is why we cannot objectively decide that they were underlyingly empty in that system. What seems certain is that they were reduced to schwas and were phonologically indistinctive. Contrast in Old Irish was rendered only by the quality of consonants, as proposed in (38).

Cyran (2003:278) proposes a formal distinction between schwas which are reduced vowels and schwas which separate consonant clusters unable to contract governing relations. On the basis of the prehistoric developments shown above, we can assume that the second realized nuclei in forms such as [klaðʲəv] *claideb*, [klaðʲəv] *claidiub*, and [klaðʲivʲ] *claidib* – 'sword'/dat.sg./gen.sg., are vowels reduced to schwas. In the last case the schwa is phonetically [i]-like because it is sandwiched between two palatalized consonants.

Nonetheless, there were also underlying empty nuclei which were realized as schwas in Old Irish. The word for 'world', that is *domun*, will serve as an example. The derivation offered by McCone (1996:127) is as follows: *dumnos → *duv̆nah → *dov̆na → (apocope) *dov̆n → *domun*. Thus, after apocope, the cluster [v̆n] was left stranded at the end of the word. Given that no interonset governing relation was permissible in this situation (see Chapter Three for details), this sequence was split by an epenthetic vowel, i.e. [ə]. McCone transcribes this form as [dov̆un] and justifies the presence of [u] by saying that [ə] "tended to be rounded in the vicinity of a labial". This suggests that he treats [u] as a contextual realization of [ə]. Later on, however, McCone (1996:135ff.) argues that there was phonemic opposition between [ə] and [u] and that [ə] had "several allophones", depending on the qualities of the flanking consonants. This standpoint seems markedly different from that quoted above, which makes McCone's treatment of the epenthetic vowel unclear. Let us recall, however, that spellings such as *domon* and *doman* are also attested, which suggests that the actual phonetic quality of this epenthetic vowel did not matter at all in Old Irish. It could have been [ə] or [u] or something in between these two. Most importantly, this [ə] or [u] was phonologically indistinctive because a contextual realization of a schwa is simply a phonetic interpretation of an empty nucleus is a given environment.

We may also add two examples (McCone 1996:127) which support the view that an epenthetic schwa had different realization depending on the environment. In the word *breːθʲrʲi → (apocope) *breːθʲrʲ → (epenthesis) [breːθʲirʲ] *bréithir* – 'word'-dat.sg., the cluster [θʲrʲ] was palatalized after apocope. When an epenthetic vowel appeared between the cluster members, it was spelt with *i*, and its phonetic realization probably reflected the spelling. In the form *breːθra → (apocope) *breːθr → (epenthesis) [briaθər] *briathar* – 'word'-nom.sg., the surviving final cluster [θr] was non-palatalized, and the svarabhakti vowel was spelt with *a*, which suggests that it may have been realized as [ə].

All this suggests that, although the Old Irish [ə] may have had two different origins, i.e. it was either a reduced vowel or a realization of an empty nucleus, there was no distinction between the diverse realizations of this schwa. Thus, phonological contrast between different words was rendered by the quality of the non-initial consonant. If this device was absent, no contrast was present.

### *4.4.3. Consonant quality agreement in syncopated words*

Finally, let us focus on an interesting phenomenon which can be detected in syncopated Old Irish word-forms. In particular, consonants displaying different qualities before syncope had to agree with respect to quality when the intervening vowel was lost. While discussing the development of the dat.pl. of the word for 'sword', i.e. *klaðʲevovʲ → (Primitive Irish syncope) *klaðʲvʲovʲ → [klaðʲvʲivʲ] *claidbib*, we did not mention that the Primitive Irish [ð] was originally slender, while [v] was broad. This distinction was simply not crucial to the discussion about vowel deletion. Now we can note that, after the intervening vowel [e] had been deleted, both these spirants were palatalized and entered Old Irish with this property. Let us now consider a few other examples which show that, after syncope, the newly formed consonant clusters must agree as regards the quality.

| (40) | ***Primitive Irish*** | | ***Old Irish*** | | |
|---|---|---|---|---|---|
| a. | *kar$^{\text{i}}$ida | → | [kaR$^{\text{i}}$d$^{\text{i}}$a] | *cairtea* | – 'friend'-acc.pl. |
| | *av$^{\text{i}}$ena: | → | [av$^{\text{i}}$n$^{\text{i}}$a] | *aibnea* | – 'river'-acc.pl. |
| | *p$^{\text{i}}$r$^{\text{i}}$iðʲiχaθ$^{\text{i}}$ | → | [p$^{\text{i}}$r$^{\text{i}}$iðʲχ$^{\text{i}}$ið$^{\text{i}}$] | *pridchid* | – '(he) teaches' |
| b. | *b$^{\text{i}}$enaθʲi | → | [b$^{\text{i}}$eNti] | *bentai* | – 'strikes him' |
| | *woɣavʲeod | → | [foɣvəd] | *:fogbad* | – 'they find'(prot.) |

What we can see in (40a) is that the left-hand emboldened consonants, i.e. [r$^{\text{i}}$], [v$^{\text{i}}$] and [ð$^{\text{i}}$] were palatalized before syncope, while the right-hand ones, i.e. [d], [n] and [χ], were not. After syncope progressive palatalization occurred and in Old Irish the clusters [R$^{\text{i}}$d$^{\text{i}}$], [v$^{\text{i}}$n$^{\text{i}}$] and [ð$^{\text{i}}$χ$^{\text{i}}$] surfaced as palatalized. In (40b), on the other hand, the left-hand emboldened segments, i.e. [n] and [ɣ], were broad before syncope, while the right-hand ones, i.e. [θ$^{\text{i}}$] and [v$^{\text{i}}$], were slender at that stage. Here progressive depalatalization took place and the resulting Old Irish clusters [Nt] and [ɣv] were broad.[22]

Thurneysen (1946:98) remarks that the quality of the first consonant was usually taken over by the second. This is confirmed by McCone (1996:129). Thus, thanks to this progressive quality assimilation, consonant sequences in Old and Modern Irish have to display the same quality.

[22] In *b$^{\text{i}}$enaθʲi → [b$^{\text{i}}$eNti] *bentai*, we can also observe the delenition of [θ] → [t]after the homorganic nasal and the tensing of [n] to [N] under the influence of the homorganic [t].

### *4.4.4. Vowels in unstressed syllables – summary*

In the second part of this chapter an attempt has been made to describe the workings of the Old Irish vocalic system with particular attention paid to the quality of unstressed vowels in word-medial position. It has been concluded that all the unstressed non-final vowels were schwas. These segments were either reduced full vowels or underlying empty nuclei which had to surface phonetically after apocope. The other problem was the number of consonant qualities in the Old Irish system. We have found no reliable evidence to counter the view that Old Irish consonants were either palatalized (slender) or non-palatalized (broad) and that palatalization, viewed as a privative property of some consonantal segments, was the only exponent of phonological contrast.

## 4.5. Alternating long vowels and consonant qualities

In the final part of this chapter we will consider an aspect of the phonology of Old Irish which is only partly connected with the problems discussed so far. In particular, what still needs to mentioned is the behaviour of long vowels in front of slender and broad consonants. Let us recall that Thurneysen (1946) proposes three consonant qualities, i.e. *i*-quality, *u*-quality, and *a*-quality. We have not found convincing evidence to maintain this division so far, but an analysis of alternating long vowels seems necessary to support our position.

Although interpretations on the subject of vowel qualities differ, we will assume that there are six long vowels in Old Irish, namely [iː], [eː], [ɛː], [aː], [oː] and [uː]. This is implied in Thurneysen (1946) and McCone (1996) although they never formally admit the synchronic distinction between the two types of *é*.[23] These vocalic segments enjoy greater distributional freedom than short vowels. In particular, short vowels cannot appear word-finally in Old Irish monosyllabic words, while long vowels can occur without any following consonants, e.g. [dʲɛː] *dé* – ‘clay’. Of course, they can also precede consonants, e.g. [dʲɛːd] *dét* – ‘tooth’, or consonant clusters, e.g. [eːsʲkʲ] *éisc* – ‘fish’-gen.sg. Moreover, they do not normally occur in non-initial syllables and they seldom alternate. However, there is one long vowel which does alternate regularly.

The only alternating vowel is *é*. The fact that this vowel changes in two different ways may suggest that there are in fact two dissimilar phonological objects

[23] Thurneysen (1946) admits that the Old Irish *é* has two different origins. Greene (1976) suggests that there were also two long *o*’s, but synchronic evidence does not seem to confirm this. It is a fact that some long *o*’s fluctuate (context-independently) with the diphthong *úa*, but otherwise the synchronic behaviour does not indicate different phonological structures of these originally dissimilar segments.

represented by *é*, i.e. [eː] and [ɛː]. Assuming that there were actually two vowels *é*, consider the following cases illustrating the two types of alternation:

(41) a. [eː] – [ia]

| | | | |
|---|---|---|---|
| [k$^{i}$eːL$^{i}$] | [k$^{i}$iaL] | *céill*/*cíall* | – acc.sg./'sense' |
| [eːs$^{i}$k$^{i}$] | [iask] | *éisc*/*íasc* | – gen.sg./'fish'-nom.sg. |

b. [ɛː] – [ɛu]/[iu]

| | | | |
|---|---|---|---|
| [N$^{i}$ɛːl] | [N$^{i}$iul$^{i}$] [N$^{i}$iul] | *nél*/*níuil*/*níul* | – 'cloud'/gen.sg./dat.sg. |
| [ɛːn] | [ɛun$^{i}$] [ɛun] | *én*/*éuin*/*éun* | – 'bird'/gen.sg./dat.sg. |

These cases show relatively regular vocalic alternations occurring in two long vowels [eː] and [ɛː]. Other long vowels do not alternate under the influence of the environment. Let us begin with the examples in (41a).

This original mid high long [eː] underwent breaking into the diphthong [ia] in Early Old Irish (Thurneysen 1946:36; McCone 1996:134) if it preceded a neutral, i.e. *a*, or rounded consonant, i.e. *u*. This means that the only condition for this vowel to break was the presence of a following broad consonant. To conclude, no distinction between *u*-quality and *a*-quality seems to be required.

The mid low [ɛː], which occurs in the cases in (41b), originates from the ancient short [ɛ] which once underwent compensatory lengthening. It surfaces as [ɛː] when preceding an *a*-quality consonant but is apparently broken into diphthongs [iu] or [ɛu] (or whatever the actual pronunciation was) before *u*-quality or *i*-quality consonants. Interestingly, words containing this long [ɛː] are spelt with the letter *u* or sometimes *o* even if the following consonant is palatalized. Actually the spelling of the gen.sg. may be *éuin*, *éoin*, or even *éiuin*. These spellings seem peculiar if we consider the prehistoric developments of the paradigmatic cases (all singular) of the word for 'bird' based on McCone (1996:122):

(42)

| | ***Primitive Irish*** | | ***Old Irish*** | |
|---|---|---|---|---|
| *ɛtnos | → *ɛθna | → *ɛθn | → [ɛːn] | NOMINATIVE |
| *ɛtniː | → *ɛθni | → *ɛθ$^{i}$n$^{i}$ | → [ɛun$^{i}$] | GENITIVE |
| *ɛtnuː | → *ɛθnu | → *ɛuθn | → [ɛun] | DATIVE |

The nominative shows that the originally short vowel [ɛ] was lengthened at the expense of the spirant [θ] between Primitive and Old Irish. Let us assume that this final fricative has *a*-quality. The nucleus is also lengthened in the other two cases. The dative displays the diphthongisation to [ɛu], which is logical since the archaic ending was [u]. When the spirant was lost, the short diphthong became

long. This also parallels the *u*-infection if unstressed vowels advocated by Greene (1976), e.g. *to$\breve{v}$essuh → *to$\breve{v}$eusu → [to$\breve{v}$u/əs] *tomus* – 'measurement'. The genitive, however, also shows the same diphthongization, which is totally unexpected taking into consideration the prehistoric version of the word, which displayed a palatalized ending and no trace of [u] was ever present in it. Greene (1976:34ff.) assumes that, when the spirant was lost, it left a rounded vowel behind. This is peculiar given that the spirant was dental. Moreover, no trace of this rounding is ever found in the nominative. The details of the formation of the genitive are unclear, then.

If we turn to the development of the diphthong [iu] in [N$^{i}$iul] *níul* – 'cloud'-dat.sg., it is interesting to note that the prime (A) is absent from both components of this diphthong. Although the origin of this form is uncertain, we may suspect that, when [ɛ] was diphthongized to [ɛu] due to *u*-infection, vowel harmony occurred. In particular, since (A) was absent in the right-hand component, i.e. [u], it had to be absent from the left-hand part, i.e. [ɛ]=(A, I) → [i]=(I).[24] In any event, the *u*-infection in the genitive [N$^{i}$iul$^{i}$] *níuil* is phonologically peculiar as well.

Compensatory lengthening affected also other non-high vowels in Primitive Irish, e.g. *magl → *maɣl → [maːl] *mál* – 'prince', *ognos → *oɣn → *oːn → [uan] *úan* – 'lamb' (Old Irish breaking of [oː] to [ua]). The long vowels in these forms are followed by the symbol *i* before palatalized consonants in the genitive, e.g. *máil*, *úain* but no sign of *u*-infection can ever be observed. A clue may be provided by the development of another compensatory lengthened vowel [ɛː] in *dakro → *dæχr → [d$^{i}$ɛːr] *dér* – 'tear'. This word initially belonged to the same declension as *nél* and *én* and displayed the dative *déor* and the genitive *déoir*. Apparently [d$^{i}$ɛːr] *dér* also developed in another declension, with a vocalic ending in the genitive, i.e. [d$^{i}$ɛːr$^{i}$e] *déire*.[25]

This dual-identity development, i.e. *déoir* vs. *déire*, and the fact that the alternation between [ɛː] and [ɛu] occurs in a handful of words classified under only one declension may suggest that the formation of the genitive took place on the basis of the dative form. In other words, palatalization may have affected word-forms which were already infected by the vowel [u]. It seems certain that palatalization occurred in three phases in Primitive Irish, around the same time as *u*-infection, and its final stage post-dated *u*-infection (McCone 1996:119). Thus, the palatalization of the *u*-infected form appears the only logical explanation of the irregularity in the genitive if we adopt the view that otherwise the developments were regular.

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[24] The head-operator status of (I) and (A) in the make-up of [ɛ] is unimportant here.
[25] The chaos in the choice of endings was discussed in (4.3.1.2.).

To sum up, the breaking of the Early Old Irish [eː] into the diphthong [ia] is the only development we can take into account while discussing the consonant qualities of Old Irish. This suggests that no distinction into two broad qualities was present phonologically. The developments in the word for 'bird' and other similar cases took place a long time before Old Irish and cannot be treated as evidence of different consonant qualities because the vocalic endings were still present at the time of alternations and, when they were dropped, no further vocalic change occurred. It seems plausible to assume that the prime (U) affected recessive nuclei via *u*-infection, while the element (A) contributed to the lowering of some vowels in Primitive Irish. Later on, however, when the effects of all these vocalic processes were petrified, no division into *a*-quality and *u*-quality was necessary.

### 4.6. Chapter Summary

In this chapter we have been dealing with short vowels in the phonological system of Old Irish. The first part was devoted to vowels in stressed syllables. At the outset, the alternating Old Irish vowels were analyzed with a view to determining whether phonological context had any impact on the vocalic changes. As a result of the analysis it transpired that the most typical Old Irish alternations have no synchronic phonological trigger and the cause needs to be sought in prehistory. The diachronic treatment of alternations revealed that Primitive Irish displayed vowel height harmony dependent on the presence or absence of the element (A) in the vocalic ending. In order to survive in the phonological structure, the prime (A) had to be linked to two consecutive nuclei. If (A) was absent from the ending, it was also not licensed in the root vowel. In the course of the analysis it was shown that not all vowels in stressed syllables containing this prime had endings also equipped with it. It was proposed that (A) had the status of a headed prime in those segments in order to be preserved in the phonological representation of a given item. Consequently, the inventory of Primitive Irish short vowels was said to contain nine phonological objects which were reduced to five by the time of Old Irish. The conclusion of the first part was that, since Old Irish vocalic alternations had no synchronic trigger, they should be viewed as morphophonological.

It was also inevitable to address the question of what and how many consonant qualities the phonological system of Old Irish possessed. After analyzing stressed vowels, it was concluded that there was no synchronic evidence that the palatalized quality had any active opponent, i.e. palatalization was claimed to be the privative property of some consonants, while others were assumed to lack this feature.

Then we turned to word-medial unstressed vowels and examined two main competitive views on both their number and qualities. Neither approach has been found plausible. As a result of a GP analysis, we proposed that there were only two consonant qualities, i.e. palatalized (slender) and non-palatalized (broad). Moreover, we argued that all the medial unstressed vowels were schwas. These schwas may have been phonetically realized in a number of ways, depending on the provenance, e.g. [a] → [ə] vs. [u] → [ə], or on the qualities of the synchronically present flanking consonants, i.e. palatalized or non-palatalized. However, these schwas were indistinctive in terms of phonology. Given that a number of lexical items displayed no visible contrast in monosyllabic words and that the syntactic behaviour of diverse cases left no doubt as to their grammatical function, it was concluded that the recognition of schwas in unstressed syllables of longer words without the concomitant acceptance of an extra consonant quality was sufficient to the phonological system of Old Irish.

Finally, the behaviour of long alterable Old Irish vowels was briefly presented and analyzed, the aim being to confirm the standpoint that the recognition of three consonant qualities in this system finds no phonological justification.

Given the postulated absence of *u*-quality in Old Irish as well as the proposal that vocalic alternations were morphophonological as early as in Old Irish, one may need to reconsider the following two aspects of Modern Irish: the presence of *u*-quality and the synchronically triggered vocalic alternations.