Issues in the vowel phoneme inventory of western Irish

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Abstract The vowels of the various dialects of Irish, including that of Cois Fhairrge examined here, are related to each other by a series of morphophonemic processes such as the lengthening of short vowels before certain word-final sonorants, and final palatalization or velarization: these are used to establish relationships between long and short and back and front vowels. The effect of additional factors such as r-lowering and nasal rising is considered and an attempt is made to predict alternations between back and front vowels given an outset position. In conclusion an analysis of four surface diphthongs is offered whereby they all can be shown to be derived synchronically from a single underlying form.

In the various studies of Irish dialects which have appeared over the last forty years the vowels of the various dialects are presented as simple taxonomies without due consideration of the relationships in which they stand to each other and to a series of morphophonemic and morphological processes which are found among nearly all the dialects. I have chosen the dialect of Cois Fhairrge for the purpose of illustration but most of the remarks are applicable to other dialects and the studies of these as well. In general the inventories of both vowels and consonants presented for the dialects are too large, this being due chiefly to two factors, the neglect of the context dependence of many segments and the adverse influence of the orthography on phonological analysis.

Vocalic segments can for analytical purposes be divided into three groups: long vowels, short vowels and diphthongs. To start with consider the group of long vowel phonemes in Cois Fhairrge Irish. This is relatively uncontroversial consisting of the five segments:

(1)  /iː/, /eː/, /aː/, /oː/, /uː/

Note that I have not included the long low vowel found in

(2)  anam [aːnəm]  ‘soul’

as this is a long allophone of the short vowel phoneme /a/. Nor have I included [æː] as in

(3)  sneachta [ʃ’n̪æːxtə]  ‘snow’

as this too is allophonic, only occurring after palatal consonants. The matter of length with these two segments is important, however. It can by no means justify the addition of these vowels to the inventory of long vowel phonemes. There is empirical justification for this. Consider the morphophonemic process which I call ‘sonorant shift’ and whereby a vowel followed by certain occurrences of word-final sonorants (former geminates) is substituted by another vowel.
The vowel before the word-final sonorant is always long. Now if the process simply required a long vowel in this position then there should be no alteration in set of words such as

(5) a. am [aːm]  ‘time-NOM’
    b. ama [aːma]  ‘time-GEN’

The reason why shift does take place he is that the /a/ vowel is phonologically short and is substituted by the phonologically long /æː/. Note further that [aː] can be shortened to [a] but the optional shortening of [aː] is blocked.

Sonorant shift provides a suitable transition to the consideration of short vowel phonemes. Take the following alternation to start with

(6) a. bonn /buːn/  ‘sole’
    b. bonnacháí /bənəxːiː/  ‘soles’

Assuming that sonorant shift involves the alternation of long and short vowel phonemes and that apart from length the vowels involved in this shift are similar then one can maintain that /ʌ/ is that short counterpart of /uː/. Note that I write [ʌ] and not [u]. The sound [u] does occur, but preferentially after labials in a velar (as opposed to a palatal) environment. I symbolize the former sound as /ʌ/ which is similar to the Hiberno-English value for the vowel in a word like but. Again note that I am not positing a short high back vowel phoneme /u/. This maybe in free variation with [u] when the environment allows, as with

(7) much [mʌx], [mux]  ‘early’

This vowel is the only short back vowel phoneme which I posit; this means that it covers both the /u/ and the /o/ phonemes found usually in Irish dialectological works. There is no justification for this pair of phonemes and it appears to be based on the orthography as the forms

(8) a. solas /sələs/  ‘light’
    b. fliuch /fliːχ/  ‘wet’

have the same vowel phonetically despite the divergent orthography. Furthermore the /o/ phoneme is incorrect anyway as there is no back rounded half-close short vowel in Irish, not even allophonically. Thus the normal transcription of solus as /soləs/ (de Bhaladraite (1945:72)) is inaccurate on phonological and phonetic grounds. After /ʌ/ the remaining short vowels of Cois Phairré are:

(9) /ʌ/, /ɛ/, /æ/, /ə/. 
The first two of these are unproblematic. They are similar to the equivalent short vowels in English and are found for example in:

(10) a. bris /b´ris/ ‘break’
    b. deir /d´e´/ ‘say’

The third vowel /a/ has been commented on already. The fourth one, /e/ has two sources. The first is as the non-stressed variant of both /a/ and /æ/ as can be seen from

(11) a. thar /har/ ‘over’
    b. thar éis /ha´re:s´/ ‘after’
    c. socair /sakr´/ ‘calm’
    d. fíorshocair /f´i:rakhkr´/ ‘very calm’

The second source is an unstressed short vowel which does not alternate with a stressed vowel synchronically. This is very frequent with post-tonic syllables, typically suffixes.

(12) a. troid /tr´(e)d´/ ‘flight-NOM’
    b. troda /tr´(a)d´a/ ‘fight-GEN’
    c. ól /o:l/ ‘drink-IMP’
    d. ólann sé /o:lân s´é:/ ‘he drinks’

After this review of the short vowel phoneme inventory the next question which needs consideration is whether the occurrence of one of the four (stressed) short vowels is predictable or not under certain conditions. In order to answer this one must consider four processes operating on vowel realization.

(13) a. r-lowering
    b. nasal raising
    c. velar retraction
    d. palatal fronting

The first of these is common not only in Irish but is found in a variety of languages including English (cf. ear /i:ə/ < /iː/ → [eə]). It affects short vowels only as in

(14) tirim /t´i:rim´/ ~ /t´e´rim´/ ‘dry’

Long vowels do not show a similar alternation in the triggering environment. This can be explained by the fact that they are more stable being of longer duration than the short vowels. With the former a given consonantal environment which begins by producing a glide before or after the vowel nucleus or which affects the periphery of the vowel in a given way (as with r-lowering) then affects the entire vocalic segment as this is short and lax. The longer and tenser vowels are usually resistant to total assimilation and have only their peripheries affected.

The second process listed above is found where a vowel is preceded by a nasal as in
This raising is a common feature in other languages as well such as Swedish\(^7\), compare *ton* /tu:n/ ‘tone’. It is not certain, however, whether following nasals cause this raising as well. Admittedly, one has realizations such as *déanamh* /d’i:n/ ‘doing’ but that could well be due to assimilation to the preceding palatal particularly as this is common in the history of Irish, cf. Old Irish nom.sg. *dia* but with /e/ vocalism in oblique cases\(^8\) and many other examples.

This remaining two processes given in (13), velar retraction and palatal fronting, are mirror images of each other. Just as r-lowering and nasal raising are assimilations (due to the formant locations for r-sounds and nasals respectively) so are velar retraction and palatal fronting cases of assimilation, this time to the place of articulation.

An example of velar retraction has already being given with the realization of /\(\Lambda\)/ as [u] in a velar environment. An example where the following segment causes the retraction would be

(16)  *ocras*  /\(\Lambda\)kr\(\Lambda\)/ [uk\(\Lambda\)]  ‘hunger’

A specialised case of velar retraction is what I call low vowel retraction whereby a short low vowel is retracted to a short back vowel when the following syllable contains a long low back vowel.

(17)  *scadán*  /sk\(\Lambda\)d\(\Lambda\)/  ‘herring’

A few remarks are necessary here. Firstly this shift occurs on a phonological level, i.e. The change is from /a/ to /\(\Lambda\)/ and this had the realization [u] as it is in a velar environment. Secondly there is a condition on low vowel retraction: it only occurs when the triggering vowel is on the same height level as the vowel affected. This blocks retraction in words such as

(18)  a.  *glantóir*  /glanto:r/  ‘cleaner’
    b.  *flaithiúil*  /flahu:l/  ‘lavish’

as the vowels of the second syllables are on the second and first levels, assuming a division of height levels as follows: 1 = /\(\Lambda\)/, 2 = /\(\Lambda\)/, 3 = /\(\Lambda\)/

Palatal fronting is the mirror image of velar retraction. Basically a palatal consonant after a vocalic segment can have two effects. It can either cause a /j/-glide to develop in addition to the original vowel or it can cause the latter to shift from a back to a front articulation.\(^9\) The latter is palatal fronting although the former effect should not be underestimated in Irish as it has contributed to the raise of diphthongs.

Cases of fronting are:

(19)  a.  *olc*  /\(\Lambda\)lk/  ‘evil-NOM’
    b.  *oilc*  /\(\Lambda\)l/k/  ‘evil-GEN’
    c.  *bonn*  /bu:n/  ‘sole-NOM’
    d.  *boinn*  /bu:n/  ‘sole-GEN’
The second set of examples additionally shows sonorant shift, hence the high long vowels.

The consideration of the effect of the surrounding consonantal environment on short vowel realizations is of primary importance in dealing with the nominal and adjectival systems. In these two areas of Irish morphology the final consonant frequently changes its value for the feature [palatal] with a change in morphological category such as singular to plural, nominative to genitive (in the singular) with nouns; positive to comparative degree with adjectives, etc. The attendant changes of the stressed short vowels of monosyllables are determined by the alteration of the syllable final consonant. In case this fact is not obvious consider a set of forms such as

(20) a. bocht /bʌxt/ ‘poor’
    b. boichte /bʌxtə/ ‘poorer’

Now if vocalic gradation, as I choose to call this vowel change, were not due to the change in syllable-final consonant then there would be no reason why the change of /i/ to /v/ which one has for example in

(21) a. fuil /fiːl/ ‘blood-NOM’
    b. fola /fɔlə/ ‘blood-GEN’

should not also be found in the forms of (20). A phonotactic restriction if Irish prevents the palatalization of /x/ before /t/ however, so that the syllable in the forms of (20) is closed by a velar consonant in both the positive and comparative degrees of the adjective. This results in vocalic gradation not taking place, something which shows its dependence on the alteration of the syllable-final consonant. Vocalic gradation is not arbitrary but follows a set of given patterns which are highly, though as will be seen not entirely, predictable for any set of forms. It consists of two movement rules, fronting and retraction and involves the four short vowel phonemes as follows:

(22) /ʌ/ ↔ /e/  
    /a/ ↔ /i/  

a. cnoc cnoc /ˈkrək/ /ˈkrɪk/ ‘hill-NOM’; ‘hill-GEN’
b. olc oile /ˈəlk/ /ˈɛlək/ ‘evil-NOM’; ‘evil-GEN’
c. fear fir /ˈfər/ /ˈfərə/ ‘man-NOM’; ‘man-GEN’
d. glac glaice /ˈɡlək/ /ˈɡlɛkə/ ‘handgrasp-NOM’; ‘handgrasp-GEN’

In actual nominal paradigms the situation is complicated by other processes such as sonorant shift, diphthongization, nasal raising also being operative.

But consider for a moment the question of whether the back short vowel is predictable from consonant environment. Both /a/ and /ʌ/ occur between velars and between a palatal and a velar consonant, however, so that they have to be lexically specified.
Let me now turn to the situation with the front vowels. Both occur before palatal consonants so that the question is: are they phonetically conditioned such that the lower vowel /e/ only occurs after a velar consonant and the higher vowel /i/ only after a palatal consonant? The attested forms present the following picture.

(24) a. glas /glas/ /gles/ ‘lock-NOM’; ‘lock-GEN’
b. nirt /n`irt/ /n`irt/ ‘strength-NOM’; ‘strength-GEN’

This means that when the back vowel is /a/ the suspected distribution is borne out by lexically attested gradations. With /A/ the matter cannot be decided. For although one has the lower front vowel after a velar consonant as in

(25) roc /roic/ /reik/ ‘wrinkle-NOM’; ‘wrinkle-GEN’

there is no form which has the alternation


despite the fact that one word cion which represents one half of this alternation has three different alternations but none which corresponds with the other half of (26)

(27) a. cion /k``n/ /k``n/ ‘share-NOM’; ‘share-GEN’
b. cion /k``no/ /k``no/ ‘offence-NOM’; ‘offence-GEN’
c. cion /k`ana/ /k`ana/ ‘fondness-NOM’; ‘fondness-GEN’

To conclude this brief survey of vowel phonemes in Cois Fhairrge I would like to turn my attention now to diphthongs. In Cois Fhairrge there are four or possibly six diphthongs. They fall into two groups as follows:

(28) a. /ai/ /au/
b. /ia/ /ua/
c. /ia:/ /ua:/

The first group arose in the course of Irish language history from two sources namely vocalized fricatives and mid vowel diphthongization with retention of the triggering consonant.

The fricatives of the first source were all voiced and ultimately lost their friction when lenition was carried to its conclusion and they formed vocalic elements which then combined with the vowel before them to yield either diphthongs or long monophthongs. This later case is similar, indeed as a natural phonetic process, identical with the first. The outcome of fricative vocalization depended on the sound involved. Labials (i.e. /v/)
coalesced with the preceding vowel (in effect /ʌ/ or /ə/) to give a long high back vowel /u:/ as in

(29) a. subh /su:/ ‘jam’
    b. Domhnach /du:nəx/ ‘Sunday’

In some cases /ʌ/ and /v/ yielded /au/ (as in domhan /daun/ ‘world’). When the vowel was /a/ the result was always a diphthong. The second element of the diphthong was either /u/ or /i/. These elements have definite sources. /u/ arose only from /v/ < /b/ + L (L = lenition), /m/ + L or /x/ < /g/ + L, /d/ + L, whereas /i/ arose from /v’/ and /x’/ or from /x/ (gh or dh) if it was preceded by /a/ only. From this one can see that /ai/ and /au/ can be regarded as palatal and velar diphthongs respectively.

(30) a. cabhair /kaur/ ‘help’
    b. foghail /faul/ ‘trespassing’
    c. staighre /stairə/ ‘stairs’
    d. adharc /airk/ ‘sight’

The second source of the diphthongs /ai/ and /au/ is related to the first inasmuch as diphthongization is determined by the following consonant and the two diphthongs are very definitely marked as palatal and velar respectively. Consider

(31) a. obair /vər/ ‘work-NOM’
    b. oibre /aibər/ ‘work-GEN’

In view of the analysis of vowel gradation presented above one would expect the alternation /ʌ/ – /e/. In fact there is reason to suppose that this is underlyingly correct. Recall that other dialects such as Munster have this surface alternation. Now recall also such alterations as

(32) a. troid /tréd/ ‘fight-NOM’
    b. troda /trədə/ ‘fight-GEN’

where the mid vowel [ɛ] appears on the surface. If the palatal consonant after it causes a /j/-glide to arise and if by reaction the vowel lowers to /a/ and one had /ai/, the vowel of oibre. Evidence for the correctness of this interpretation can be seen in (i) the alternative pronunciations of certain words such as /dre:d/ and /draid/ for droichead (the length of the monophthong arises from the vocalization of /x’/) and (ii) from parallel behaviour with the diphthong /ia/ which arose from /e/ preceded by a palatal. Here a preceding palatal introduced a palatal glide before the vowel nucleus and the latter lowered to /a/ by reaction to the high vowel /i/; it was further reduced to /ə/ because of lack of stress).

(33) ord /aurd/ < /ərd/ ‘sledge-hammer’
The occurrence of these diphthongs in nominal paradigms may obscure the underlying regularity of the front-back alternation which exists among forms whose final consonants alternate between palatal and velar. But not if one bears in mind that /ʌ/, /ə/ and /au/ on the one hand; /æ/, /i/, and /ai/ on the other are regarded as velar and palatal vocalic segments respectively within the system of alternations. Alternations may be mixed as with the forms in (31) or be entirely diphthongal as with

(34) a. poll /paul/ ‘hole-NOM’
    b. poill /pail̃/ ‘hole-GEN’

The remaining diphthongs present difficulties because their autonomy is uncertain. Consider the first pair /iə/ and /uə/. First of all they are identical with the vocalic core of many forms which obviously do not contain diphthongs but rather sequences of long vowels and velar off-glides.

(35) a. iatacht [iət̪əx̂t̪] ‘constipation’
    b. iotacht [i:iət̪əx̂t̪] ‘avidity’
    c. cuaradh [kuəɾ̪ə] ‘curving’
    d. cúradh [ku:iɾ̪ə] ‘chastisement’

Secondly as /iə/ is only to be found after palatal consonants and /uə/ only after velar ones the first element becomes predictable so that the vowel can be morphophonemically represented as {t̪o} and its occurrence restricted to word-final positions as well other instances could be seen as sequences of long vowel and velar off-glide. This extreme reductionist view would see the only occurrence of this diphthong as word-final as in the following two forms which again would be two realizations of the one diphthong.

(36) ↗ /iə/ C[+pal] —
    /iə/

Exx.
    bia /bɹ̪iə/) ‘food’
    bua /buə/) ‘victory’

The second set /iːə/ and /uːə/ are definite diphthongs as they occur within the consonantal borders of lexical forms and do not have a morpheme boundary running through them (contrast) bóin ‘little cow’ = /boː/ + /iːn/). The difference between this and the second set lies in the second element. This can, however, be easily accounted for. Consider the occurrence of these diphthongs; two examples are

(37) a. lián /lˈiːən/ ‘trowel’
    b. suán /suə:n/ ‘juice’

It will be noted that they only occur before word-final sonorants (nasals). Although in their development they have nothing to do with the forms which developed sonorant shift, synchronically they can be regarded as manifesting the same phenomenon, so that the
second element of both sets of diphthongs is underlyingly the same: in the first case a low short vowel was reduced to shwa because of lack of stress and in the second example a low short vowel was shifted to /a:/ on sonorant shift and was retained because long vowels are not phonologically reduced when post-tonic. This would mean that the four diphthongs could be reduced to one with the following distribution:

(38)  \{IA\}  \rightarrow  /ia/  / C[pal] —  

/ia:/  / C[pal] — [Son]  

/u/  / C[vel] —  

/u:/  / C[vel] — [Son]  

Notes

1 This is a revised version of a paper held at the Seventh International Congress of Celtic Studies, 10-15.7.1983 in Oxford.

2 By these I am referring principally to Ó Cuív (1944), de Bhaldraithe (1945), Breatnach (1947), Wagner (1959), Mac and Fhailigh (1968), de Búrca (1970).

3 As described in de Bhaldraithe (1945) and (1953). The material is based additionally on my own observations in this area and with the closely related dialect of Inis Meáin.

4 This is truest of Wagner (1959) who has an inventory of sounds well in excess of the phonemes of the dialect he is investigating. To give an example of what I mean consider the following segments which are represented in nearly all the dialect studies /hL/, /hl/, /hn/, /hn/. In each of these cases one had a biphonemic sequence of /h/ and a sonorant. The /h/ arises from the lenition of /s/ (sometimes /t/) and the consequent voiceless sonorant is the phonetic result when a sonorants follows the lenited segment. The practice of representing these sequences as if independent phonemes was established quite early, for example in Sommerfelt (1922: 79f.)

5 This is dealt with by Bhaldraithe (1953) under the general heading ‘Athrú ar Ghuthaí’ for the various declensions (and contains other vowel alternations apart from this).

6 See Bhaldraithe (1945:15f.), Ó Cuív (1944: 21f.) for a detailed discussion on back vowels.

7 See Malmberg (1971:67f.) for a description of this.

8 See Thurneysen (1946:217f.)

9 These two possibilities and their further ramifications are treated in de Búrca (1977/78) especially p. 398.

10 By this I mean that /e/ and /A/ were diphthongized to /ai/ and /au/ respectively as in poll /paul/ and poill /paill/. These vowels were between the low short vowel /a/ and the high short vowel /u/ hence the label mid-vowel.

11 For West Munster see Ó Cuív (1944: 20+16) who has /Abr’/ and /eb’tr’/ and for East Munster see Breatnach (1947: 29+68) who has /Abr’/ and /eb’tr’/ also.

12 See de Bhaldrathe (1945:11).
This can be seen with certain changes which carry on a vowel alternation originating in Old Irish (Thurneysen, 1946: 165f. for example dian ‘hard’, déine ‘severity’.

References