

2 Consonant mutations

2.1. Introduction

The main aim of this chapter is to analyze the system of word-initial consonant mutations in Old Irish. It will be argued that these seemingly phonological phenomena ought to be viewed as an example of the interplay between phonology and morphology. Given that these mutations are by and large a reflection of earlier purely phonological processes, a diachronic inspection of the phonological system will turn out to be necessary. In order to discover the past phonological nature of these mutations and the close relationships between words within syntactic groups, we will go back to prehistoric periods and investigate the contexts in which these alternations took place (chiefly the intervocalic context). It will be shown that these mutations were originally triggered by a purely phonological context and were subsequently lexicalized when this context disappeared as a result of morphological changes. In many cases, however, the appearance of the new context triggered new modifications whose lexicalization also occurred.

This chapter is organized in the following way. At the beginning, an introduction to Irish mutations will be offered. This will be accompanied by a general description of the Old Irish phonological system. The rest of the chapter will be divided into two parts, each devoted to one mutation. Firstly, we will concentrate on lenition viewed from the perspective of Old Irish. A historical inspection of leniting and non-leniting contexts as well as the subsequent changes of these environments will constitute the bulk of this part. Second, we will turn to nasalization. Also taking Old Irish as a point of departure, we will propose an analysis of this mutation in prehistoric contexts.

2.1.1. Consonant mutations

Mutations of initial consonants are among the most outstanding features of not only Old Irish but also of the other Celtic languages, both past and present. Changes of radical segments are presently found also in Welsh, Breton and Scottish Gaelic. Different surface forms of lexical items resulting from these consonant alterations have crucial grammatical functions. For instance, the Old Irish word [tʰeɣ] *teg* – ‘house’, beginning with a voiceless dental, is realized as one with the voiced stop in the phrase [ə ˈdʰeɣ] *a teg* – ‘their house’, and with a voiceless fricative in [ə ˈθʰeɣ] *a theg* – ‘his house’. The radical variant surfaces

in the utterance with the feminine pronoun, i.e. [əˈtʰeɣ] *a teg* – ‘her house’ (McCone 1996:121). All these versions of the segment [t] are phonologically related but the identical contexts shown above, always after a phonetic schwa, suffice to diagnose these mutations as not phonological.

The fact that as early as in Old Irish the initial mutations were morpho-syntactic in nature does not mean that there had never been any phonological motivations for these alternations or that at some stage the alternations themselves were not phonological. In prehistoric times, when Celtic languages were in the process of being formed, consonantal segments underwent regular changes triggered by precisely determined phonological contexts. In closely connected syntactic groups the endings of mostly function words exerted influence on the initial segments of the following lexical items. For example, the three possessive pronouns shown above, whose Old Irish shape was *a* (phonetically [ə]), developed from the pre-historic (Proto-Indo-European) *esjo – 3sg. masculine, i.e. the pronoun was terminated by a vowel, *esja:s – 3sg. feminine, where the pronoun ended with a consonant, and *esjo:m – 3pl., in which the pronoun-final segment was a nasal. These diverse items had different impact on the initial consonants of following words. After *esjo (masculine) the lenition of consonants took place, as a result of which in Old Irish the masculine pronoun was followed by the voiceless spirant in [əˈtʰeɣ]. After *esja:s (feminine) nothing happened to the following consonant and the radical voiceless stop was intact in [əˈtʰeɣ]. Finally, after *esjo:m (plural) nasalization occurred and the Old Irish pronoun was followed by the voiced stop in [əˈdʰeɣ]. The contexts mentioned above can be roughly summarized as follows (V stands for ‘vowel’, N for ‘nasal’, while C for ‘consonant’):

- (1) a. ...V#CV... – lenition
 b. ...s#CV... – no change
 c. ...N#CV... – nasalization

A word of comment is in place here. In context (1b) the consonant terminating the word preceding the word boundary need not be [s]. It can be any consonant but a nasal. It so happens, however, that this spirant was by far the most frequently occurring segment in this position, which is why this context is normally treated as one with [s]. Moreover, any nasal could terminate the word preceding a word boundary in (1c). Nonetheless, at the time of nasalization, the only nasal in this position seems to have been [n]. Later on mutating contexts disappeared which resulted from the fact that final syllables were gradually lost. Consider the following developments (McCone 1996:121) which illustrate the schematized contexts in (1) above:

(2)	<i>Stage I</i>	<i>Stage II</i>	<i>Stage III</i>	<i>Old Irish</i>
a.	*esjo tegos	*eja θeyah	*eja θeyə	[ə 'θ ⁱ ey] <i>a theg</i> – ‘his house’
b.	*esja:s tegos	*eja:h teyah	*eja: teyə	[ə 't ⁱ ey] <i>a teg</i> – ‘her house’
c.	*esjo:m tegos	*ejan teyah	*eja deyə	[ə 'd ⁱ ey] <i>a teg</i> – ‘their house’

This chain of events shows the phonological causes of both lenition (2a) and nasalization (2c) as well as the reason why no process occurred in (2b). In particular, the original [t] in *tegos was intervocalically lenited to the corresponding fricative [θ] at Stage II in (2a) above. This intervocalic context for the obstruent remained also in Old Irish. In (2b) the original initial [t] underwent no change because at Stage II it was preceded by a consonant. Later on, although the final consonant was lost at Stage III and [t] found itself in intervocalic position, no lenition of [t] to [θ] took place because this mutation was no longer active, i.e. it had become lexicalized. In (2c) the original [t] was preceded by a nasal at Stages I and II. At Stage III this nasal was dropped, but it left a trace behind, namely the nasalization (voicing) of [t] to [d]. It may be assumed that the nasal was not simply deleted but that the pronoun and the noun formed a phonological word, i.e. *ejan teyah → *ejanteyah, which later resulted in the voicing of the original voiceless stop, i.e. *ejanteyah → *ejadeyə. The newly formed voiced stop [d] did not undergo weakening to the fricative at Stage III, although it found itself in the intervocalic environment, because lenition was no longer a phonologically triggered process.

The developments in (2) above demonstrate how the original contexts caused three different outcomes of the prehistoric word *tegos in Old Irish. The key to understanding the nature of mutations is that they stopped being phonological a long time before Old Irish. Had that not been the case, the Old Irish orthographic sequence *a t(h)eg* would have been interpreted only as [ə 'θⁱey] because the synchronic context for the occurrence of the original [t] in this expression was intervocalic. Therefore, by becoming exponents of number and gender, among other things, the initial mutations had been lexicalized and their nature was no longer phonological in Old Irish. What remained, however, was the phonetic shapes of segments, which have survived by and large unchanged even until the present day, and the correspondence between their radical and mutated versions.

2.1.2. *The phonological system of Old Irish*

It can be generally assumed that the phonological system of Old Irish, dating approximately from 700 to 900 A.D., contained the following inventory of vowels and diphthongs (McCone 1996:26):

(3)

	<i>short</i>	<i>long</i>
<i>vowels</i>	i, e, a, o, u	i:, e:, a:, o:, u:
<i>diphthongs ?</i>	ai, oi, ui, iu, eu, au, ia, ua	i:u, e:u, a:u

Although the quality and quantity of the pure vowels is not subject to any major debate, the shape and number of diphthongs have been a bone of contention for the past few decades. The main problem with classifying these objects concerns the spelling conventions. In particular, it is not always certain whether vocalic digraphs denoted diphthongs or pure vowels followed by consonants of different qualities, e.g. palatalized. The questions of qualities as well as those concerning the shape of some short diphthongs will be dealt with in Chapter Four. What is more, it is not definite whether the so-called long diphthongs were long vowels followed by short ones or just expressions consisting of two dissimilar melodies of equal length. Although the system of Old Irish diphthongs is not discussed in this work, we may occasionally need to refer to some segments from this table.

Apart from vowels and diphthongs, the system of Old Irish comprised the following collection of consonantal segments (McCone 1996:26):

(4)

	<i>labial</i>	<i>coronal</i>	<i>velar</i>	
<i>stops</i>	p, b	t, d	k, g	
<i>fricatives</i>	f, v	θ, ð, s	χ, γ	
<i>nasals</i>	m, ñ	N, n	ŋ	
<i>liquids</i>		R, r, L, l		
<i>aspirated</i>				h

All these Old Irish consonants, depending on the environment in which they find themselves, i.e. whether they synchronically or historically precede front or back vowels, can be either palatalized (slender) or non-palatalized (broad). For example the labial [b] is slender in the word [bⁱeg] *becc* – ‘small’, but broad in [bo:] *bó* – ‘cow’. This distinction between slender and broad consonants may be called phonological since it is triggered by the presence of a particular type of vowel (front or back) following a given consonant. Moreover, unlike in Modern Irish, the occurrence of a front vowel after a non-palatalized consonant is generally assumed to be unlikely in Old Irish, although the non-palatalization of e.g. [r] in [ri:] *rí* – ‘king’ in Modern Irish may suggest that the Old Irish version, i.e. [Ri:], was an exception as well. The reverse situation is also viewed as non-occurring. More details can be found in Chapter Four.

In Old Irish, however, one can observe another type of palatalization, which may be labelled grammatical. This palatalization came to play important grammatical distinctive roles when historical vocalic endings were dropped in Primitive Irish (a period about 200–400 years before Old Irish). Thus the Old Irish word for ‘sound’ ends with a palatalized nasal in the genitive singular [sunⁱ] *suin* and with a non-palatalized variant in the dative singular [sun] *sun*. Not only single consonants but also consonant groups were distinguished by palatalization, e.g. [NⁱeRt] *nert* vs. [NⁱeRⁱtⁱ] *neirt* – ‘strength’/gen.sg.

Moreover, the palatalized property was allegedly capable of spreading to consonants which were not in the immediate neighbourhood of a front vowel, e.g. in the word [mⁱlⁱɣⁱidⁱ] *mligid* – ‘(he) milks’ both initial consonants are slender although only the rightmost one, that is [l], immediately precedes the vowel [i]. Even more interestingly, palatalization could go beyond the lexical word to affect the preceding item. For example, the palatalization of the word-initial spirant in [sⁱerk] *serc* – ‘love’ is natural and uncontroversial unlike in the utterance [iNⁱ tⁱ erk] *int serc* – ‘the love’, where the consonantal segments [N] and [t], neither of which seem to belong to the noun, are palatalized by the front vowel [e] (Lewis and Pedersen 1974:218).

It should also be mentioned that there is no concord among scholars as to the exact quality of non-palatalized consonantal segments. The subdivision of broad consonants postulated by certain scholars will be dealt with in Chapter Four.¹ Now let us return to the description of the consonant inventory of Old Irish.

Pokorny (1914:6ff.) and Thurneysen (1946:22ff.) use the terms ‘voiced’ and ‘voiceless’ to denote the difference between related pairs of consonants such as [d – t], but it is not uncommon, especially taking into account contemporary phonetic evidence, to use the terms ‘lenis’ and ‘fortis’ for these segments respectively. This means that sounds such as [p, t, k] and their corresponding fricatives [f, θ, χ] are aspirated, while their counterparts [b, d, g, v, ð, γ] are not. It may also be assumed that the aspirated consonants were fully voiceless, while the non-aspirated ones were not fully voiced, like in English for example.

The orthographic sonorants *n*, *l*, *r* can be realized in two ways. In particular, they can appear as tense or lax. The former are very frequently written double in mediaeval manuscripts, which may indicate that at some stage they were geminates, and are represented by capital letters in the phonetic transcription. The phonetic details as well as a possible phonological distinction between the two types of sonorants are provided in the ensuing sections. The labial nasal [m] is realized as the labial nasal fricative [ɱ] in leniting, i.e. weakening environments.

¹ More details concerning palatalization in and before Old Irish can be found in e.g. Kuryłowicz (1971), Greene (1973) and McCone (1996).

The velar nasal, although it is included in (4) above, is not always treated as an independent segment since it never occurs in a context-free environment. It is always represented by *ng* in the spelling and its status as a single segment is to a certain extent unclear.

Finally, the sound [h] occurs only in restricted contexts, namely as a lenited variant of [s], e.g. [ə 'halm] *a salm* – ‘his psalm’, or as a segment prefixed to word-initial vowels in some contexts, e.g. [ə 'ho:r] *a ór* – ‘her gold’. The latter phenomenon, also referred to as *h*-prefixation, is described in detail later in this chapter.

The above consonantal system, which is rich in fricatives, results from intervocalic weakening processes which affected stops inherited from the Proto-Indo-European (PIE) inventory by the Celtic family long before the year 400 or 500 A.D., that is, a very long time before the Old Irish period. The fact that lenition ever took place can be noticed when we look at the correspondence between Old Irish, the oldest attested representative of the Celtic tongues, and other IE languages such as Latin. Consider the following examples:

(5)	<i>Old Irish</i>		<i>PIE</i>		<i>Latin</i>	
	[ma:θər ⁱ] <i>máthair</i>	θ <	t ^h	> t	<i>māter</i>	– ‘mother’
	[eχu] <i>echu</i> (acc.pl.)	χ <	k ^h	> k	<i>equus</i>	– ‘horse’
	[gav ⁱ ð ⁱ] <i>gaibid</i> (3sg.)	v <	b ^h	> b	<i>habeō</i> (1sg.)	– ‘take/have’

The examples above indicate that the PIE aspirated stops became unaspirated in Italic languages, while they were turned into fricatives within the Celtic branch. This is not always the case for Celtic forms, however. In fact both these language families chiefly inherited the unaspirated stops (Gamkrelidze and Ivanov 1995:65ff., 743), which can be exemplified by numerals such as the Old Irish [tⁱrⁱ:] *trí* vs. the Latin *tres* – ‘three’ as well as [kⁱeθərⁱ] *cethair* vs. *quattuor* – ‘four’. These forms show the development of the IE aspirated stops [t^h] and [k^h] respectively, into [t] and [k] in both the families. What differentiates the two families is that in Celtic the IE aspirated stops became fricatives in intervocalic position but remained stops word-initially.

Nevertheless, word-initial position did not guarantee the Celtic stops any protection against lenition. In syntactically motivated contexts, that is, mainly after function words ending in vocalic segments, the initial stops also underwent changes to fricatives. Hence, comparably to the word-internal change of [b] into [v] which we observed in the case of [gavⁱðⁱ], we witness the spirantization of [b] in the pair of [baL] vs. [ə 'vaL] *ball/a ball* – ‘limb’/‘his limb’. This indicates that the original word-internal weakening contexts, that is ...VCV..., were equal

to ...V#CV..., as also shown in (1a), where **C** stands for any true consonant lenited intervocalically. This latter consonant alteration is usually called initial lenition. Various aspects of this phenomenon will be discussed in this chapter as well as in Chapter Three.

The other mutation described and analyzed below is called nasalization. This change affected initial consonantal segments originally following function words ending in nasals, as shown in (1c). What needs to be mentioned here is that the process of nasalization occurred later than that of weakening. Unlike lenition, which has been shown to occur both word-initially and medially, this regular change is normally treated as a typical sandhi phenomenon taking place exclusively at the left margin of words. It will be shown below, however, that the origin of this mutation can be detected word-internally. Descriptions of both these phenomena will be accompanied by Government Phonology accounts with particular emphasis placed on the application of the theory of elements sketched in the introductory chapter.

2.1.3. Old Irish initial lenition

As stated earlier, Old Irish was spoken in the second half of the first millennium, whereas the phonological process of intervocalic lenition occurred a long time earlier. Therefore, although segments are still lenited in certain contexts in Old Irish, this fact does not mean that this weakening is phonological any longer. A good case in point is that Old Irish consonants can appear in their weakened versions even though what synchronically precedes them is not a vowel, e.g. [iN 'χorⁱpⁱ] *in choirp* – ‘of the body’, the lenited form of [korⁱpⁱ] *coirp* – ‘of a body’. Moreover, certain segments are not lenited when synchronically following a vowel, e.g. [ə 'tⁱey] *a teg* – ‘her house’. The same can be said about Middle and Modern Irish, where lenition has a purely grammatical function and can occur even without any phonological contexts, that is, word- or sentence-initially (see e.g. Gussmann 1983). For example, in the Modern Irish sentence [χⁱ:mⁱ b̪a:d] *Chím bád* – ‘I see a boat’, the first segment of the first word, i.e. [χ], is lenited although there is nothing preceding it in the sentence. At the time of phonologically motivated lenition, that is, a long time before Old Irish, such a situation would have been completely impossible.

The initial purpose of the following presentation is to show what happens to particular consonants when they appear as lenited in documented sources and pinpoint certain regularities. In later parts of this chapter we will go back in time, explore the phonological causes of weakening processes in detail and see the developments which ultimately produced the Old Irish forms. We will also investigate the reasons why expected processes did not always take place.

Let us first consider a selection of Old Irish data which show the reflexes of the past phonological process of lenition.

(6) a. ***Stops***

p	→ f	[po:g] [ə 'fo:g]	<i>póc/a phóc</i>	– ‘kiss’/‘his kiss’
t	→ θ	[tʰeY] [mə 'θʰeY]	<i>teg/mo theg</i>	– ‘house’/‘my house’
k	→ χ	[kʰeN] [də 'χʰeN]	<i>cenn/do chenn</i>	– ‘head’/‘your head’
b	→ v	[baL] [ə 'vaL]	<i>ball/a ball</i>	– ‘limb’/‘his limb’
d	→ ð	[dun] [mə 'ðun]	<i>dún/mo dún</i>	– ‘fort’/‘my fort’
g	→ ɣ	[goRt] [də 'ɣoRt]	<i>gort/do gort</i>	– ‘field’/‘your field’
m	→ ˜	[munʰ] [ə '˜unʰ]	<i>muin/a muin</i>	– ‘neck’/‘his neck’

b. ***Fricatives***

s	→ h	[suθ] [mə 'huθ]	<i>suth/mo suth</i>	– ‘offspring’/‘my offspring’
f	→ ø	[fʰið] [də 'ið]	<i>fid/do fid</i>	– ‘wood’/‘your wood’

c. ***Sonorants***

R	→ r	[Ru:n] [ə 'ru:n]	<i>rún/a rún</i>	– ‘secret’/‘his secret’
L	→ l	[Loŋ] [də 'loŋ]	<i>long/do long</i>	– ‘ship’/‘your ship’
N	→ n	[NʰeRt] [mə 'nʰeRt]	<i>nert/mo nert</i>	– ‘strength’/‘my strength’

As can be seen above, all the stops become corresponding fricatives, the coronal fricative [s] turns to [h] and the labial spirant [f] disappears altogether. The bilabial nasal [m] is also treated by the system as a typical stop which undergoes spirantization.

As far as the initial sonorants are concerned, there is much confusion about what their lenition means phonetically. Pokorny (1914:32) names the stronger variants ‘unaspirated’, while the lenited congeners are referred to as ‘aspirated’.² Thurneysen (1946:85) states that the unlenited sonorants, that is [N], [L] and [R], were “articulated with much greater energy”. Quin (1975:4) claims that the frequently doubly-written sonorants represented strongly pronounced vibrants. McCone (1987:267) speculates that weakening “probably somewhat relaxed the articulation” of [N], [L] and [R]. This statement tallies with the most commonly held opinion that the unlenited sonorants were simply tense segments whereas their weakened counterparts were lax. Later on we will see how this distinction can be represented phonologically.

² Pokorny uses these terms for unlenited and lenited variants of true consonants, respectively, as well.

As regards word-initial clusters of consonants, stops and the labial voiceless fricative [f] behave in exactly the same fashion as single stops and [f] when followed by sonorants, so we can observe the following changes in leniting contexts (whenever there is a difference in the spelling of the lenited variant, it is indicated; otherwise both the radical and lenited forms are spelt in the same fashion):

(7)			
pr	→ fr [pro:s ⁱ] [fro:s ⁱ]	<i>próis/phróis</i>	– ‘prose’
pl	→ fl [p ⁱ l ⁱ e:] [f ⁱ l ⁱ e:]	<i>plé/phlé</i>	– ‘pleading’
br	→ vr [bra:θ] [vra:θ]	<i>bráth</i>	– ‘doom’
bl	→ vl [bla:s] [vla:s]	<i>blás</i>	– ‘smoothness’
tr	→ θr [t ⁱ r ⁱ e:n] [θ ⁱ r ⁱ e:n]	<i>trén/thrén</i>	– ‘strong man’
tl	→ θl [tla:s] [θla:s]	<i>tlás/thlás</i>	– ‘feebleness’
tn	→ θn [tnu:θ] [θnu:θ]	<i>tnúth/thnúth</i>	– ‘rage’ (rare cluster)
dr	→ ðr [drum ⁱ] [ðrum ⁱ]	<i>druimm</i>	– ‘back’
dl	→ ðl [d ⁱ l ⁱ iγ ⁱ əð] [ð ⁱ l ⁱ iγ ⁱ əð]	<i>dliged</i>	– ‘law’
kr	→ χr [kruθ] [χruθ]	<i>cruth/chruth</i>	– ‘form’
kl	→ χl [klaNd] [χlaNd]	<i>cland/chland</i>	– ‘family’
kn	→ χn [knok] [χnok]	<i>cnoc/chnoc</i>	– ‘hill’
gr	→ γr [gra:n] [γra:n]	<i>grán</i>	– ‘grain’
gl	→ γl [glu:n] [γlu:n]	<i>glún</i>	– ‘knee’
gn	→ γn [g ⁱ n ⁱ i:~v] [γ ⁱ n ⁱ i:~v]	<i>gním</i>	– ‘deed’
fr	→ r [fraγ ⁱ] [raγ ⁱ]	<i>fraig</i>	– ‘wall’
fl	→ l [flaθ ⁱ] [laθ ⁱ]	<i>flaith</i>	– ‘prince’
mr	→ ~vr [mruγ ⁱ] [~vruγ ⁱ]	<i>mruig</i>	– ‘farmland’
ml	→ ~vl [mlas] [~vlas]	<i>mlas</i>	– ‘taste’

What is worth noting here is the absence of initial [pn], [bn], [dn], [fn] and [mn] and, consequently, their presumed lenited counterparts. In fact, [dn] and [mn] occur in the language, but only in nasalized environments. For example, [dnu:θ] is a version of [tnu:θ] – ‘rage’ while the other cluster surfaces in a few oblique cases of the word [bⁱen] *ben* – ‘woman’. For instance, its apparently irregular genitive is [mna:] *mná*.

Another group of word-initial clusters is that including the coronal fricative. Sequences composed of *s*+obstruent and *s*+stop+liquid are immune to all possible weakening environments and invariably remain unlenited. A few of these clusters are dubious in that it is difficult to say whether they were part of Old or Middle Irish. These are marked with (?):

(8)

sp [s ⁱ p ⁱ irəd] <i>spirut</i>	– ‘spirit’	spl? [s ⁱ p ⁱ l ⁱ eð] <i>spled</i>	– ‘play’
		spr? [s ⁱ p ⁱ r ⁱ eð] <i>spréd</i>	– ‘spark’
st [stor ⁱ] <i>stoir</i>	– ‘history’	str? [stroð] <i>stród</i>	– ‘conceit’
sk [skaθ] <i>scáth</i>	– ‘shadow’	skl [s ⁱ k ⁱ l ⁱ eo] <i>scléo</i>	– ‘sorrow’
		skr [s ⁱ k ⁱ r ⁱ m] <i>scrín</i>	– ‘shrine’
sm [s ⁱ m ⁱ eχ] <i>smech</i>	– ‘chin’	smr? [s ⁱ m ⁱ r ⁱ iθ] <i>Smrith</i>	– man’s name

The clusters [sk] as well as [sm], with or without the following liquid, represent native Celtic groups while the ones with [sp] and [st] are foreign borrowings. Regardless of provenance and the time of appearing in the system, none of these are lenited. On the other hand, all the clusters consisting of *s*+sonorant undergo regular weakening. Examples of this configuration are shown below:

(9)

sL → hl [sLo:γ] [mə 'hlo:γ]	<i>slóg/mo slóg</i>	– ‘army’/‘my army’
sR → hr [sRuθ] [ə 'hruθ]	<i>sruth/a sruth</i>	– ‘stream’/‘his stream’
sN → hn [sNa:θ ⁱ e] [ə 'hna:θ ⁱ e]	<i>snáithe/a snáithe</i>	– ‘thread’/‘his thread’

This set of *s*+sonorant clusters reveals another controversial phenomenon, that is, the apparent lenition of tense sonorants which follow the initial spirant. The assumption that they should be represented by the weak variants in a leniting context, although this is not indicated in the spelling, is based on the commonly held view that [N], [L] and [R] are always tense after [s] but lax after all the other consonants, e.g. [kruθ] *cruth* – ‘form’ (Lewis and Pedersen 1974:49; Thurneysen 1946:74ff.). Thus it transpires that, when [s] undergoes lenition, the following sonorant also loses tenseness. This may have been the case in Old Irish. However, it will be shown below that in prehistoric periods, that is, when lenition was phonological, the situation was slightly different.

As regards the cluster [sm], the details of what part it played in the process of lenition are unclear. The spelling usually gives no indication as to how this sequence was pronounced although occasionally the *punctum delens* (a superscript dot indicating that the segment is weakened or deleted) appears above *s*, i.e. *ṡ*. Thurneysen (1946:76), referring the reader to Gwynn (1926:63), claims that the Old Irish [sm] was regularly weakened, unlike that in Middle and Modern Irish where the sequence [hm] is viewed as basically intolerable.³ Lewis and Pedersen (1974:24), also following Gwynn, note that it was originally subject to lenition “but early gave up the lenited form”. How early this happened is hard to ascer-

³ Ó Siadhail (1989:112ff.) remarks that [hm] occurs in some Munster dialects nowadays.

tain but the only example they all provide (*ledmagtach* from *smacht* – ‘rule’) is contained in the Würzburg Glosses 11^d16. Interestingly, Thurneysen as well as Stokes and Strachan (1901:571), who edited this piece of writing, find this word difficult to interpret. Thus, if the cluster [sm] is really lenited, the dental spirant disappears altogether because [hm] is unpronounceable, which may be confirmed by the existence of words such as *mér* (a variant of *smér* – ‘blackberry’, possibly originating from the lenited version). Nevertheless, the facts that the phonological system of Old Irish found this lenition unendurable and that this particular type of weakening is extremely rarely marked in the spelling by the *punctum delens* above *s* may indicate that there simultaneously existed two equally feasible principles of treating this cluster. The one which entailed lenition gave way to the other in the course of Old Irish.⁴ As a result, the end of the period witnessed the absence of lenition in this initial group.

Yet another issue is worth mentioning here. There is a minor group of words beginning with [s] which originated from the prehistoric **sw* or **sp*. Words like *siur* – ‘sister’ or *sesser* – ‘six persons,’ when lenited, become *fiur* and *fesser*, respectively (Thurneysen 1946:84). Lewis and Pedersen (1974:18) note that in the latter form the *punctum delens* appeared above *f*, thus giving [h] from [f]. Pokorny (1914:36) remarks that Indo-European lenited groups such as **sp*, **sv* become *f*. McCone (1996:130) implies also that very early in the history of Irish **w* merged with **h* to produce **f* and that *s* is substituted for *f* in some old Latin loanwords. Besides, Kortlandt (1982:80ff.) argues that this *f* was a bilabial fricative, while the one appearing independently in word-initial position was a labiodental spirant. All such differences were lost after the beginnings of writing. Putting all these confusing viewpoints together, it transpires that the labial spirant [f] functioned as a lenited variant of [s] if this coronal fricative had originally been followed by a labial segment. Whether this was a truly phonological process or a functional replacement is unclear.

Having inspected the details of initial lenition we arrive at the conclusion that it has three aspects as it involves three disparate processes. In terms of manner features, stops become continuants, e.g. [baL] → [vaL] *ball* – ‘limb’. As regards the place of articulation, both fricatives occurring independently in lexical items lose it: [s] becomes back in [salm] → [halm] *salm* – ‘psalm’, or disappears in [smaχt] → [maχt] *smacht* – ‘rule’, while [f] invariably gets deleted in [fⁱið] → [ið] *fid* – ‘wood’. Also in certain contexts [s] changes the place of articulation and becomes [f], e.g. [siur] → [fiur] *siur/fiur* – ‘sister’. Finally, sonorants lose tenseness, e.g. [Ru:n] → [ru:n] *rún* – ‘secret’. In the next section a GP approach

⁴ This obviously refers to words in which the deletion of the fricative was not lexicalized by the end of the period, as in *mér* for example.

to lenition in terms of phonological elements will be offered with a view to understanding the basic mechanisms of this process.

2.1.4. Element-based approach to lenition

Bearing in mind that triggers of lenition were no longer phonological in Old Irish, let us now focus on the aspect of weakening of Old Irish consonants connected with element complexity. The theory of elements presented in the introductory chapter will provide us with appropriate tools to conduct this analysis.

What needs to be clarified at the very outset of the discussion is the choice of elements proposed below. It is assumed here that all the segments contain the headed elements defining the place of articulation. The labial obstruents contain the headed (U), the dentals the combination (A-I),⁵ while the velars are defined by the element (@) considered as neutral. The necessity for segments to include headed elements is strictly connected with the fact that the prime (h) defining noise in standard GP is not employed here. Its absence in this analysis is associated with the adoption of Cyran's (1996, 2003) h-parameter. Among other things, his proposal establishes a correlation between the lack of affricates in a given language and the absence of the element (h). In Old Irish there were no affricates. Moreover, he claims that in a language which has no element (h), friction in obstruents can be represented by headedness. A similar standpoint is advocated by Ritter (1997). Leaving other details of their reasoning aside, we can also propose that the remaining elements constitute a sufficient set to represent Old Irish consonants. We also use the prime (H) to represent voicelessness, the element (?) which stands for stopness, and (N) to denote nasality. Consider the following structures in which all stops become fricatives.

(10) <i>Fortis stop</i>	→ <i>Fricative</i>	<i>Lenis stop</i>	→ <i>Fricative</i>
p (<u>U</u> , ?, H)	→ f (<u>U</u> , H)	b (<u>U</u> , ?)	→ v (<u>U</u>)
t (<u>A</u> -I, ?, H)	→ θ (<u>A</u> -I, H)	d (<u>A</u> -I, ?)	→ ð (<u>A</u> -I)
k (<u>@</u> , ?, H)	→ χ (<u>@</u> , H)	g (<u>@</u> , ?)	→ γ (<u>@</u>)
		m (<u>U</u> , ?, N)	→ ð̃ (<u>U</u> , N)

The schematized set above illustrates what happens to Old Irish weakened stops in terms of the element make-up. This picture is surprisingly regular in every detail since all the consonants lose only one phonological prime due to lenition. Moreover, it is always the same element, that is (?). Accordingly, all of them be-

⁵ It is proposed here that in the combination (A-I) the first element is headed. This combination is postulated by Cyran (1997) as a representation of coronality for Modern Irish.

come corresponding fricatives. The nasal [m] is treated here as a true consonant rather than a sonorant since it conforms to the standard observed in obstruents.

This table reveals another important thing. The process of lenition viewed as a loss of one element is regular for all the stops. Nevertheless, not all of these segments were present in the system of Irish when the triggers of lenition were purely phonological. The voiceless labial stop was not part of the inventory inherited from Proto-Celtic. The Indo-European [p] simply disappeared from Celtic languages, e.g. Latin *pater* vs. Old Irish *athair* – ‘father’. It was reintroduced into the system of Primitive Irish mainly with Latin loanwords and rapidly conformed to the pattern observed in all the other stops which had undergone the process of lenition early in prehistory.⁶ This shows that the tendency to spirantize stops, that is to deprive them of the property of stopness, was so strong that even when lenition was no longer phonological but morpho-syntactic, as it was in late Primitive and Old Irish, the newly introduced stop followed suit and was realized as the fricative [f] in so-called leniting environments.

To conclude: since all the stops lose only stopness, the working hypothesis is that lenition involves dropping one element at a time. We can assume, then, that when lenition was phonologically-triggered, this regularity was also observed and it is any deviation from this pattern which requires further explanation.

Before we turn to the Old Irish fricatives and sonorants which occur independently in lexical items as well as to their weak counterparts, a word of comment is needed to justify the employment of elements in the coronal segments.

The adoption of the h-parameter limits the number of element combinations, which results in the need to make different use of the remaining primes. For example, the standard GP (e.g. Harris 1994:171) perceives certain segments as differing by the element (h) only, i.e. [d] = (R, ?, h), while [l] = (R, ?). We have replaced the element (R) by (A-I) in the dental stops and disposed of the prime (h) altogether. At this juncture, the representations of both [d] and [l] will be identical, i.e. (A-I, ?). So as to solve this problem we can theoretically resort to the concept of headedness and propose that [d] = (A-I, ?), as suggested in (10), while [l] = (A-I, ?). However, the notion of headedness will turn out to be necessary for the differentiation between tense and lax sonorants (see below), which means that we need to represent the liquid [l] using different elements. This can be done if we introduce a formal division of coronal segments into dentals and ([t, d, θ, ð, n]) alveolars ([s] and liquids). Such a division, although it is only functional here, has some phonetic justification. Thus, the place of articulation in dentals will be represented by (A-I), while (A) will stand for the same property

⁶ The names and chronology of relevant prehistoric periods will be given while dealing with the historical causes of lenition below.

in alveolars.⁷ Keeping in mind this formal distinction, consider the element structures of the two radical and lenited fricatives:

- (11) s (A, H) → h (H)
 f (U, H) → ∅

We can see that the coronal spirant [s] loses one element, similarly to the stops, while the labial fricative is deprived of two. Thus, its lenition is incongruous from the systemic viewpoint because as many as two elements are lost. Later on it will be shown that there is a historical reason for this apparent irregularity in the system, which will strengthen the observation that lenition as a phonological process involved the deletion of one prime.

A similar problem can be noticed in the case of the lenition of [s] to [f] in certain words. For example, *siur* – ‘sister’ when lenited, becomes *fiur*. Cases like these, when treated synchronically, are totally irregular because the change of (A, H) into (U, H) does not entail any element loss whatsoever, but rather element replacement. This constitutes a problem because weakening consists in losing elements, while the substitution of (U) for (A) can hardly be viewed as weakening. Nonetheless, two synchronic solutions can be offered. One is that there is another sound [s], let us label it [s]₂, whose element make up is, say, (U, A, H) which, when lenited, becomes the regular [f] = (U, H).⁸ There may also exist a different [f], let us name it [f]₂, which results from the lenition of the regular [s] = (A, H) to [f]₂ = (H). The synchronic co-existence of disparate element structures producing identical phonetic entities within phonological systems is advocated by Gussmann (2001). However, knowing that Old Irish lenition is far from being truly phonological, we may treat this change from [s] to [f] as a reflection of a past phonological phenomenon. In the sections dealing with pre-Old Irish mutations we will see that phonology had much to do with this change but this fact cannot be discovered when looking at Old Irish alone.

As to the Old Irish sonorants, it has already been mentioned that they are tense when unlenited and lax if lenited. The following tentative structures can be given for the tense sonorants:

- (12) N (A-I, N)
 L (A, ?)
 R (A)

⁷ A similar division is proposed for Welsh in Cyran (2003:66).

⁸ Hamp (1951) also proposes that there were two different segments [s] in Old Irish.

Such a proposal can be justified in the following way. The dental nasal, similarly to the other dentals is defined by the combination (A-I) and incorporates the element (N) responsible for nasality. The occlusion element is not considered to be part of this nasal because there is no evidence that it should be present there. The liquids, being lateral and alveolar, are defined by the element (A). Additionally, the liquid [l] contains the stopness element.⁹

This choice of elements shows that, unlike in stops and fricatives, the lenition of sonorants must manifest itself in a different way. What is altered in both these groups is the force of articulation. However, in the case of stops this alteration involves the change from stops to fricatives, which is connected with the loss of the stopness element (?), while in sonorants tenseness is lost. Tenseness can be observed in certain languages, such as English for example, in vowels. In English short vowels are lax while the long ones show considerable tenseness. In GP such a distinction can be rendered by employing the notion of headedness. Tense segments are headed while lax expressions lack headship. Since sonorants are closer to vowels in the sonority hierarchy than stops, we may cautiously assume a similar differentiation for the Old Irish sonorants.¹⁰ This is shown below:

- (13) N (A-I, N) → n (A-I, N)
 L (A, ?) → l (A, ?)
 R (A) → r (A)

As suggested above, the lax sonorants differ from their stronger congeners only in the headship of one element. The headed prime is invariably (A) because all the sonorants are coronals and it is typical in GP analyses to ascribe headedness to the element determining the primary place of articulation, while in dentals (I) represents the secondary place.¹¹

To sum up, the lenition of stops and [s] involves the delinking of one prime, the weakening of sonorants can be viewed as the suppression of headship, while [f] remains a maverick in that it loses two primes when lenited. This and other interesting issues will be tackled when we have discussed the other Old Irish mutation, that is nasalization.

⁹ Cyran (2003) assumes that the prime (?) is present in laterals but may or may not be present in nasals. This standpoint is followed here.

¹⁰ In fact, tenseness and headedness in vowels are frequently combined with their being linked to two skeletal positions (e.g. in English). Nonetheless, at this stage there is no reason for postulating double linking in the case of Old Irish sonorants.

¹¹ Cyran (1997:180ff.) offers an analysis of r-sounds in Modern Irish in which the strong variant, viewed as a trill or fricative, is represented by the headed (A), while the weak one, realized as a flap, with (A).

2.1.5. Old Irish initial nasalization

Similarly to lenition, nasalization has a purely grammatical function in Old Irish because the prehistoric context shown in (1c), that is ...N#CV..., is no longer present, as exemplified by [tⁱey] *teg* – ‘house’ → [ə dⁱey] *a teg* – ‘their house’. The very term ‘nasalization’ is also somewhat imprecise when we look at what happens to the radical consonantal segments in nasalizing environments. In particular, only the radical voiced stops are nasalized, while the voiceless obstruents cease to be voiceless. Therefore, the more neutral term ‘eclipsis’ is frequently used while dealing with this mutation.

Moreover, the details of pronunciation in the case of nasalized obstruents are debatable because the mediaeval spelling can be interpreted in different ways. For example, Grijzenhout (1995:103) argues that initial sequences such as *mb*, *nd*, *ng* should be phonetically interpreted as [mⁿb], [nⁿd], [ŋⁿg], respectively, while the voicing of voiceless stops consists in their deaspiration, e.g. radical [t^h] → nasalized [t]. Other scholars, including Quin (1975:9), Lehmann and Lehmann (1975:22), McCone (1987:268) and Ahlqvist (1994:31), represent a different approach to the phenomenon of nasalization and its possible phonetic details. In general, the prevailing standpoint is that, similarly to what is observed in Modern Irish, voiceless stops and [f] become voiced, while voiced stops are replaced by the corresponding nasals due to eclipsis. Consider the examples below in which the more common view is presented:

(14) a. *Voiceless obstruents*

p	→ b	[p ⁱ eN] [ə b ⁱ eN]	<i>penn/a penn</i>	– ‘pen’/‘their pen’
t	→ d	[t ⁱ eyəð ⁱ] [ə d ⁱ eyəð ⁱ]	<i>tengid/a tengid</i>	– ‘tongues’/‘their tongues’
k	→ g	[kol] [ə g ^o l]	<i>coll/a col</i>	– ‘sin’/‘their sin’
f	→ v	[ful ⁱ] [ə v ^u l ⁱ]	<i>fuil/a fuil</i>	– ‘blood’/‘their blood’

b. *Voiced stops*

b	→ m	[bo:] [ə m ^o :]	<i>bó/a mbó</i>	– ‘cow’/‘their cow’
d	→ N	[du:n] [ə N ^u :n]	<i>dún/a ndún</i>	– ‘fort’/‘their fort’
g	→ ŋ	[g ⁱ ene] [ə ŋ ⁱ ene]	<i>genae/a ngenae</i>	– ‘mouths’/‘their mouths’

It is shown above that, as a result of eclipsis, the voiceless stops and the labial fricative [f] are turned into their voiced counterparts. The lenis series, in turn, display ‘true’ nasalization because they are turned into the corresponding nasals.

As regards initial clusters, the effects of eclipsis are comparable to those observed in initial single consonants, just like in the case of lenition. Specifically, groups such as [tn], [br], [fl] etc. become [dn], [mr], and [vl] respectively, e.g.

[bro:] vs. [ə 'mro:] *bró/a mbró* – ‘quern’/‘their quern’. On the other hand, configurations involving *s*+consonant remain unaffected by this process. Further details will be provided whenever necessary.

The remaining five consonants, that is *n*, *l*, *r*, *s* and *m* are frequently doubled in the spelling when eclipsed. This orthographic device was used by mediaeval scribes to indicate the absence of lenition. No phonetic effects of nasalization are said to be visible in these segments. This is not surprising in the case of the sonorants, since it is difficult to imagine the nasalization of liquids or the idea that nasals could be even more nasalized. The coronal spirant [s] has no voiced counterpart in the system of Irish so eclipsis cannot apply to it either.

To sum up, in consequence of nasalization the radical voiceless obstruents are replaced by their voiced counterparts, whereas the voiced stops acquire the nasal property. The following section will provide an element-based analysis of this initial mutation.

2.1.6. Nasalization in terms of elements

In this part we will see how the process of Old Irish eclipsis described above can be explained in terms of changes in the element make-up of the segments involved. Bearing in mind that the radical voiceless stops become voiced, while the voiced ones are turned into the corresponding nasals, we can make the following systemic assumptions as regards the element structures of nasalized segments. First, given the representations in (10), we assume that the radical voiceless obstruents possess the element (H), while their voiced counterparts lack it. Thus, the eclipsis of voiceless obstruents consists in the loss of this element. As for the radical voiced stops, these become the corresponding nasals. Given that nasality is represented by the element (N), the eclipsed voiced stops acquire this prime. Consider the following structures.

(15)		LOSS OF (H)	ADDITION OF (N)
		<i>Fortis obstruents</i> → <i>Lenis obstruents</i>	<i>Lenis stops</i> → <i>Nasals</i>
p	(<u>U</u> , ?, H)	→ b (<u>U</u> , ?)	b (<u>U</u> , ?) → m (<u>U</u> , ?, N)
t	(<u>A</u> -I, ?, H)	→ d (<u>A</u> -I, ?)	d (<u>A</u> -I, ?) → N (<u>A</u> -I, ?, N)
k	(<u>@</u> , ?, H)	→ g (<u>@</u> , ?)	g (<u>@</u> , ?) → ŋ (<u>@</u> , ?, N)
f	(<u>U</u> , H)	→ v (<u>U</u>)	

The table above suggests that, as a result of eclipsis, the Old Irish consonantal segments are subject to two diverse element alterations. Specifically, the radical voiceless obstruents lose the element (H) responsible for voicelessness, while the

voiced stops acquire the nasal element (N). In other words, the fortis segments undergo decomposition while the lenis ones experience composition. This seems slightly peculiar since a phonological process should ideally manifest itself in the same way in all the segments involved. However, as shown in the introduction, eclipsis in Old Irish is no longer a phonologically motivated process, which means that we cannot treat it on a par with purely phonological processes that occur in languages synchronically. Thus, there may be a few reasons why in Old Irish eclipsis entails two dissimilar operations.

First, the prehistoric phonological process of nasalization and its reflection in Old Irish may differ with respect to the details of element operations. In particular, the original process may have been uniform in the treatment of the nasal element addition, while the intervening stages of language development obliterated that regularity.

Second, it is not unlikely that in prehistory there were two distinct phonological operations, composition and decomposition, whose roles in segment alternations were similar and which merged in Old Irish due to the grammaticalization of all past phonological processes.

Third, the element structures of Old Irish segments shown in (15) and based on systemic assumptions may be incorrect. As already mentioned, Gussmann (2001) proposes that certain identical phonetic segments in Russian, Polish and Welsh have different phonological structures, i.e. they are ‘double agents’. Thus, from the viewpoint of the Element Theory, it is not impossible in principle to assume that the Old Irish nasalization of, say, [t] to [d], involved the addition of the prime (N) to the voiceless consonants as well, i.e. [t] = (A-I, ?, H) → [d] = (A-I, ?, H, N). Under such an assumption, there would be two different phonological structures realized as [d] in Old Irish: one radical (A-I, ?), while the other resulting only from eclipsis (A-I, ?, H, N). The same hypothesis refers to all the radical voiced stops. We may also assume that the tense dental nasal is a double agent in that the radical [N], e.g. [NⁱeRt] *nert* – ‘strength’ consists of (A-I, N), as proposed in (13), while the [N] which represents the eclipsed [d], e.g. [du:n] vs. [ə 'Nu:n] *dún/a ndún* – ‘fort’/‘their fort’, is composed of (A-I, ?, N), as suggested in (15).

It goes without saying that none of these hypotheses can be verified when looking at Old Irish alone. Thus, the remainder of this chapter will be devoted to a diachronic analysis of both lenition and nasalization. Particular attention will be paid not only to the description of changes occurring at the beginnings of words, but also to finding the reasons why mutations did not take place in certain environments.

2.2. The history of leniting and non-leniting contexts

2.2.1. Introduction

The leniting and non-leniting contexts were exactly opposite in the prehistory of Irish and, consequently, they produce different results in Old Irish. As shown in (2.1.1.) the Proto-Indo-European possessive pronouns, that is *esjo – 3sg. masculine (ending with a vowel, i.e. leniting) and *esja:s – 3sg. feminine (ending in a spirant, i.e. non-leniting), had different influence on the initial consonant of the following noun in the prehistory of Irish, e.g. *esjo tegos → [ə ˈθʲeɣ] *a theg* – ‘his house’ (spirantization of [t]) vs. *esja:s tegos → [ə ˈtʲeɣ] *a teg* – ‘her house’ (no change of [t]). In some cases, however, the results brought about by leniting and non-leniting contexts were identical. Consider two representative examples below:

(16)

- a. *esja sintus → [ə ˈhe:d] *a sét* – ‘his path’ LENITING
 b. *esja:s (j)ænto- → [ə ˈhe:d] *a ét* – ‘her jealousy’ NON-LENITING

In (16a) we can see a reconstructed version of the masculine possessive pronoun followed by a noun beginning in the spirant [s]. Other details apart, this fricative is intervocalically lenited, i.e. *esja sintus → *ehja hintuh, due to which the Old Irish version of the noun in *a sét* displays the initial [h]. In (16b) the prehistoric feminine pronoun ends in a spirant, while the noun begins in a vowel (or semi-vowel), which means that there is no lenition. And yet the Old Irish version of *a ét* – ‘her jealousy’ is phonologically (and phonetically) identical to the phrase *a sét* – ‘his path’ in (16a).

Another example comes from nouns preceded by the definite articles. The PIE nominative singular masculine *sindos is non-leniting in Celtic, while the nominative singular feminine *sinda: is leniting. Also here the Old Irish versions of the following phrases are not indicative of their prehistoric shape.

(17)

- a. *sinda: sulis → [iN ˈtu:lʲ] *int súil* – ‘the eye’ LENITING
 b. *sindos ek^wos → [iNʲ ˈtʲeɣ] *int ech* – ‘the horse’ NON-LENITING

Similarly to those in (16), the examples in (17) show a leniting item, i.e. the definite article *sinda: (nom.sg.fem.) in (17a), and its non-leniting counterpart *sindos (nom.sg.masc.) in (17b). The results in Old Irish are identical in that both the nouns begin with a phonetic [t]. Taking into account lenition alone, that is the weakening of [s] to [h] in *sinda: sulis:→ *inda: hū:lih, it is impossible to

account for the origin of the stop [t] in [iN 'tu:lʲ]. Nor can we explain why the original *sindos ek^wos became [iNʲ tʲeχ] *int ech* in Old Irish.¹²

These examples are but tiny pieces of evidence which suggest that the analyses of leniting and non-leniting contexts should be carried out together and that discovering regularities in one may contribute to the understanding of the other. Moreover, the cases in (16) and (17) indicate that also the developments which followed lenition and preceded Old Irish should be carefully examined. Before this is conducted, let us see how lenition was triggered in some environments and prevented in others.

2.2.2. The history of lenition

Lenition affected the consonantal system of Celtic consonants many centuries before the period of Old Irish. It is not particularly important to pinpoint exactly when particular developments took place but rather to propose a relative chronology of these changes. Such a method is employed in the majority of accounts of early Celtic developments. Kortlandt (1979) and, particularly, McCone (1996) maintain that, after Proto-Indo-European (PIE), we can distinguish the following prehistoric stages of development relevant to this study:

(18)

PIE → PROTO-CELTIC → INSULAR CELTIC → PRIMITIVE IRISH → OLD IRISH

These are cover terms which are normally used to describe long eras of development. It was not the case, however, that a particular process began and ended in exactly one epoch. Intervocalic lenition, both word-medial and initial, is said to have commenced in the period called Proto-Celtic and basically ended in a much later stage named Primitive Irish. At first, any single intervocalic voiced stop was weakened to the corresponding fricative. Afterwards the weakening affected also word-initial voiced stops and [s]. Later still, voiceless stops were subject to phonetic weakening in all word positions. This is illustrated below:

¹² The loss of the initial [s] in the articles occurred between Proto-Celtic and Insular Celtic. Since this development had no impact on mutations, below we will not be discussing this issue in detail.

(19) PROTO-CELTIC (word-medial) d g b m ↓ ↓ ↓ ↓ ð γ v ˜v	'the prayer' *sinda: g ^w iɖija: ↓ *sinda: g ^w iðija:	'his house' *esjo tegos ↓ *esjo teγos
INSULAR CELTIC (word-initial and medial) s d g b m ↓ ↓ ↓ ↓ ↓ h ð γ v ˜v	*inda: g ^w iðeja: ↓ *inda: γuðeja:	*esjo teγos ↓ ↓ *ehja teγah
PRIMITIVE IRISH t k (later) p w ↓ ↓ ↓ ↓ θ χ f ø		*ehja teγah ↓ *ehja θeγa
OLD IRISH VERSIONS	[iN 'γuð ⁱ e] <i>in guide</i>	[ə 'θ ⁱ eγ] <i>a theg</i>

Thus, voiced stops and [m] were lenited as early as in Proto-Celtic, the fricative [s] in Insular Celtic (when Irish and Welsh were still similar enough to undergo the same processes), while voiceless stops (except [p] which had not yet been borrowed into Celtic) in Primitive Irish (McCone 1996:96ff.). The labial voiceless stop was imported some time between Primitive Irish and Early Old Irish and automatically followed the pattern of lenition observed in the other stops. Therefore its lenition must have taken place at that time. As for the glide [w], it was lenited to zero either in late Primitive Irish or in Early Old Irish.

For the present analysis, the exact dating of these events is not particularly important, because what is salient is not the time but the order in which things developed. Nor was every phase of development important for every single lexical item. Thus, while using the reconstructed versions of phonological phrases which help to discover the processes which ultimately produced the Old Irish forms, terms such as 'Proto-Celtic' or 'Primitive Irish' will not be used too frequently in this discussion. What we will be focusing upon is the reconstructed versions of certain utterances and their relationship with forms present during earlier or subsequent major phases of evolution. Consequently, we will be following the standard principle of relative chronology and dealing with 'stages' of development. A 'stage' itself will not be associated with a particular period but rather with its own position in a sequence of changes illustrating a given problematic issue. So, for example, in the case of [ə 'θⁱeγ] *a theg* – 'his house', Stage I

will display *ehja teyah while Stage II *ehja ʰeyah, because the development relevant to this analysis (initial lenition) took place only between these two stages, both of which belong to Primitive Irish. The fact that [ə ʰey] is derived from the Proto-Celtic *esjo tegos is irrelevant since no initial lenition can be observed during this period. In [iN ʰyudʰe] *in guide* – ‘the prayer’, Stage I will comprise *sinda: ɡʷiðija:, while Stage II *inda: ʰyudēja:, because it was between these two Insular Celtic phases that the initial lenition occurred.

As to word-initial lenition proper, it can be unequivocally stated that words ending in vowels, be they lexical or function words, caused the weakening of word-initial segments of the following lexical items in close syntactic groups of words. This weakening was a development of intervocalic word-internal lenition, i.e. when the context ...V#CV... became equal to ...VCV... . Consider the following examples (McCone 1996:41, 84, 89, 111, 120). They illustrate a few relevant stages of development of certain phrases in which phonological lenition took place across word boundaries in the prehistory of Irish.¹³

(20) WORD-INITIAL LENITION AFTER ITEMS ENDING IN VOWELS

<i>Stage I</i>		<i>Stage II</i>		<i>Old Irish</i>
*sinda: banna:		*inda: vanna:		[iN ⁱ v ⁱ eN ˈṽa:r]
ma:ra:	→	ˈṽa:ra:	→	– ‘the great peak’ (fem.) ¹⁴
*sinda: kloka:		*inda: ʰloxa:		[iN ʰloχ ʰθrom]
trumba:	→	θrumba:	→	– ‘the heavy stone’ (fem.)
*sinda: ɡʷiðija:	→	*inda: ʰyudēja:	→	[iN ʰyud ⁱ e] – ‘the prayer’ (fem.)
*esjo su:lis	→	*ehja hu:lih	→	[ə ʰu:l ⁱ] – ‘his eye’
*ehja teyah	→	*ehja ʰeyah	→	[ə ʰey] – ‘his house’
*ehja la:ṽa:	→	*ehja la:ṽa:	→	[ə ʰla:ṽ] – ‘his hand’

The examples in (20) show the major stages¹⁵ in the development of certain syntactic phrases. Stage I in (20) above shows phonological phrases from before the

¹³ Most examples used in this work are gathered from and based on McCone (1996). No direct page reference can sometimes be given since these cases are collected from different parts of this book and the order of relevant stages is frequently incomplete.

¹⁴ Irish syntax requires that the order of words in these examples be article+noun+adjective, so ‘the great peak’ is literally ‘the peak great’.

¹⁵ I name the stages shown here ‘major’ because only these developments are relevant to the present discussion. The fact that after, for example, *inda: vanna: ˈṽa:ra: there were phases involving ‘minor’ changes, such as final-vowel shortening *iNda vanna ˈṽa:ra, final vowel reduction *iNdə vannə ˈṽa:rə, and deletion (apocope) *iNd vann ˈṽa:r, and a few other adjustments, is disregarded here for the sake of simplicity.

initial lenition, be they Proto-Celtic, Insular Celtic or Primitive Irish. In Stage II we can observe the same forms which have already undergone weakening, e.g. ***b**anna: **m**arra: → ***v**anna: **ṽ**arra: – ‘great peak’, ***k**loka: **t**rumba: → ***χ**lo**χ**a: **θ**rumba: – ‘heavy stone’ and *sinda: **g**^wiðija: → *inda: **ʏ**uðeja: – ‘the prayer’. These prehistoric developments show, among other things, why the Old Irish definite article ending in a consonant, e.g. [iN ‘ʏuðⁱe] – ‘the prayer’, triggered lenition in the initial consonant of the closely connected following word. The prehistoric version of the article was *sinda:, which means that it ended in a vowel and created a weakening site at the time when lenition was phonological. Thus, the Old Irish reflex of the article is of no importance. Note also that the initial consonants of the adjectives **m**arra: and **t**rumba: are lenited after the final vowels of the nouns, e.g. *banna: **m**arra: → *vanna: **ṽ**arra: and *kloka: **t**rumba: → *χlo**χ**a: **θ**rumba:, which means that not only function words but also lexical items ending in vowels were capable of triggering lenition in the initial segments of the following words.

Generally, then, the examples in (20) show the expected development of stops into fricatives, e.g. [b, m, k, g, s, t] into [v, ṽ, χ, ʏ, h, θ], respectively, as well as one surprising phenomenon. Specifically, nothing happens to the liquid in the prehistoric development of [ə ‘la:ṽ] – ‘his hand’. Let us recall that in Old Irish sonorants such as *l* occur as tense [L] in non-leniting contexts and as lax [l] in weakening sites. In fact, the resonants were never tense before the leniting phase so they cannot be viewed as lenited afterwards. We will return to the question of why sonorants are ever tense in the ensuing sections.

It is also worth noting that a leniting context need not be only ...V#CV... but also ...V#CRV..., where the symbol R stands for any resonant, as exemplified by *sinda: **k**loka: **t**rumba: → *inda: **χ**lo**χ**a: **θ**rumba:. Discovering the reasons why a sonorant behaves like a vowel in creating a weakening environment belongs to the issues dealt with in the following chapter. Here we only observe that the presence of a sonorant before a vowel does not prevent the lenition of the preceding obstruent.

2.2.3. Non-leniting contexts

Now let us turn to the so-called non-leniting contexts. As already observed, the original word-initial radical consonants following other (non-nasal) consonants which ended closely connected syntactic groups did not undergo weakening. Consider the following examples of prehistoric phonological phrases as well as their Old Irish reflexes.

(21) ABSENCE OF LENITION AFTER ITEMS ENDING IN CONSONANTS

<i>Stage I</i>	<i>Stage II</i>	<i>Old Irish</i>
*sindos bra:tir ma:ros	*indah bra:θir ma:rah	[iN 'bra:θər ⁱ 'ma:r] – ‘the big brother’(masc.)
*sindos kali:kos tanawyos	*indah kalijaχah tanawijah	[iN 'kal ⁱ eχ 'tane] – ‘the thin cock’ (masc.)
*sindos ballos	*indah baLah	[iN 'baL] – ‘the limb’ (masc.)
*sindos ri:s bodar	*indah Ri:h boðar	[iN 'Ri: 'boðər] – ‘the deaf king’ (masc.)
*esja:s la:ma:	*ehja:h La:řva:	[ə 'La:řv] – ‘her hand’

Stages I and II in (21) above reveal a few changes in the shape of the exemplary phonological phrases but word-initial lenition never takes place there. The main reason why this is so is that all the function words and lexical items in both stages end in consonants, e.g. *sindos **bra:tir** **ma:ros** → *indah **bra:θir** **ma:rah** – ‘the big brother’, which can be contrasted with *sinda: **banna: ma:ra:** → *inda: **vanna: řva:ra:** – ‘the great peak’ from (20) above, where intervocalic lenition occurred. Thus, the absence of lenition is regular and predictable.

More interestingly, the original lax sonorants [r] and [l] in Stage I in (21) above, i.e. *sindos **ri:s** and *esja:s **la:ma:**, surface as tense [R] and [L] in Stage II, that is *indah **Ri:h** – ‘the king’ and *ehja:h **La:řva:** – ‘her hand’, respectively. As regards the tensing of sonorants, McCone (1996:82, 87), among others, hypothesizes that the lax sonorants inherited from Proto-Celtic were strengthened to their tense counterparts exclusively in non-leniting environments but remained intact in leniting contexts, as exemplified by *ehja **la:řva:** → *ehja **la:řva:** → [ə 'la:řv] – ‘his hand’ in (20). Therefore, the generally accepted claim (e.g. Quin 1975:8) that in Old Irish the tense sonorants are weakened to their lax counterparts in leniting environments, e.g. radical [La:řv] – ‘hand’ → lenited [ə 'la:řv] – ‘his hand’, may result from a misinterpretation of the historical developments or from a simplification of the description of Old Irish. The changes in (21) suggest that it was not lenition in weakening contexts but, rather, fortition in non-leniting environments that affected sonorants in the prehistory of Irish. Thus, a regular Old Irish development should have been exactly the opposite, i.e. [la:řv] – ‘hand’ → [ə 'La:řv] – ‘her hand’. We will try to discover why the context-free [La:řv] also displayed the tense liquid later in this chapter.

To summarize, the developments shown in this section as well as in the preceding one consist in the regular lenition of radical obstruents in intervocalic environments, i.e. between two vowels or between a vowel and a sonorant, as well as the absence of weakening in non-leniting contexts. The prehistoric lax

sonorants behave differently in that they seem to be unaffected by weakening contexts and strengthened in no-mutation sites.

However, the exemplary phrases in (20) and (21) show only regular changes and they do not explain all the word-initial adjustments which took place between Proto-Indo-European (or Proto-Celtic) and Old Irish, such as, for example, those presented in (2.2.1.), i.e. leniting *sinda: su:lis → [iN 'tu:lʲ] *int súil* – ‘the eye’ and non-leniting *sindos ek^wos → [iNʲ 'tʲeχ] *int ech* – ‘the horse’.

The ensuing sections will deal with adjustment processes which chronologically followed the phenomena illustrated in (20) and (21) above, that is lenition and no-mutation respectively. We will be scrutinizing the development of phonological phrases (i.e. close syntactic groups) until the period of Old Irish. Since the so-called non-leniting contexts may shed more light on the nature of all adjustment processes than the weakening ones, we will first concentrate on these non-mutating environments.

2.3. Non-leniting environments and pre-Old-Irish adjustment processes

2.3.1. Non-leniting definite articles

The nominative singular masculine definite article creates one of the contexts where no phonological process is believed to have taken place in prehistory. This is the standard view (Thurneysen 1946:294, Strachan 1949:1). The historical development of this article is shown below:

(22)

*sindos → *indah → *iNda → *iNdə → *iNd → [iN / iNt] (Old Irish)

As shown above, this article displays two versions in Old Irish. The examples below show that one variant occurs before consonants, while the other before vowels.

(23) a. BEFORE TRUE CONSONANTS [iN]

[iNʲ 'fʲer]	<i>in fer</i>	– ‘the man’
[iNʲ 'gʲin]	<i>in gin</i>	– ‘the mouth’
[iNʲ 'mʲes]	<i>in mess</i>	– ‘the judgement’

b. BEFORE TENSE SONORANTS [iN]

[iN 'Ri:]	<i>in rí</i>	– ‘the king’
[iNʲ 'Nʲe:l]	<i>in nél</i>	– ‘the cloud’
[iNʲ 'Lʲevər]	<i>in lebor</i>	– ‘the book’

c. BEFORE VOWELS [iNt]

[iN ⁱ 'tar ⁱ e]	<i>int aire</i>	– ‘the nobleman’
[iN ⁱ 'tiask]	<i>int íasc</i>	– ‘the fish’
[iN ⁱ 't'eχ]	<i>int ech</i>	– ‘the horse’

The distribution of the nom.sg.masc. definite article is complementary: it surfaces as [iN] in front of radical true consonants (23a) and tense sonorants (23b), while it appears as [iNt] before vowels (23c).¹⁶ As indicated by (23a, b), there seems to be no difference between a radical obstruent and a tense sonorant in the treatment of the preceding article in that both these groups of segments follow the form [iN].

A similar phenomenon can also be observed in Modern Irish, where the occurrence of [t] between the definite article and a vowel-initial noun is called *t*-prefixation, e.g. [ən tasəl] *an t-asal* – ‘the donkey’. Analyzing *t*-prefixation in Munster Irish, Cyran (1997:143) proposes that, synchronically, the stop [t] is a floating segment which is underlyingly present in the structure of the article and which can be attached to an empty onset only if such a position is available:

(24)

			O ₁	N ₁	O ₂	N ₂	O ₃	N ₃
x	x		x	x	x	x	x	x
			/					
ə	n	t		a	s	ə	l	

[ən tasəl] *an t-asal* – ‘the donkey’

In this representation the floating dental fortis stop [t] terminating the article is attached to the onset position (O₁) provided by the vowel-initial lexical stem. When a lexical object begins with a consonant, there is no *t*-prefixation since the dental finds no available onset position to dock onto. As a consequence, the article appears as [ən], for example [ən t'igⁱ] *an tigh* – ‘the house’.¹⁷ What should be emphasized here is that, unlike in *an tigh*, the stop [t] in *an t-asal* is not lexically associated with any skeletal slot; it is a floating segment. This segment can become part of the phonological phrase and be phonetically realized only if an onset position is made available by vowel-initial words, just like in (24) above.

¹⁶ This distribution resembles that of the indefinite article in Modern English, that is [ə] before consonants and [ən] before vowels, e.g. [ə leg] *a leg* vs. [ən eg] *an egg*.

¹⁷ For similar analyses of floating sounds in English and French see Harris (1994:230ff.) and Kaye (1995).

A similar analysis could be postulated for Old Irish. In particular, it might be claimed that the nom.sg.masc. definite article was underlyingly [iNt] and that the final [t] was realized only if the following word was vowel-initial. However, if we look back on the development of the article presented in (22), the reason why [t] terminates the article [iNt] in front of vowels is far from being obvious: this article itself had never ended in [t] in the prehistory of Irish.

Thus, although synchronically in both Old and Modern Irish *t*-prefixation could be analyzed in the way shown in (24), another solution has to be sought if this phenomenon is to be explained in diachronic terms. The ensuing sections will offer a historical reason for the occurrence of *t*-prefixation in both Old and Modern Irish. First, however, we will concentrate on a related phenomenon, that is *h*-prefixation.

2.3.2. *h*-prefixation

The analysis of *t*-prefixation in Modern Irish proposed by Cyran (1997) takes into account only the synchronic state of affairs. Historical evidence suggests, however, that *t*-prefixation was not a one-step process either in or before Old Irish. In fact, in Old Irish we can observe only the final results of a chain of events, which involved the so-called *h*-prefixation, vowel deletion and a merger of consonants. Before we analyze this sequence of processes in detail, let us consider the following developments (McCone 1996:121):

(25) <i>Stage I</i>	<i>Stage II</i>	<i>Stage III</i>	<i>Old Irish</i>
a. *esjo ek ^w os	*ehja eχ ^w ah	*eja eχ ^w a	[ə 'eχ] <i>a ech</i> – ‘his horse’
b. *esjo tegos	*ehja θeγah	*eja θeγa	[ə 'θ ⁱ eγ] <i>a theg</i> – ‘his house’
c. *esja:s ek ^w os	*ehja:h eχ ^w ah	*eja: heχ ^w a	[ə 'heχ] <i>a ech</i> – ‘her horse’
d. *esja:s tegos	*ehja:h teγah	*eja: teγa	[ə 't ⁱ eγ] <i>a teg</i> – ‘her house’

The examples in (25a, b) show the development of the PIE possessive masculine pronoun *esjo (leniting) followed by nouns. In (25a) the noun begins in a vowel, i.e. *esjo ek^wos, while in (25b) with a consonant, i.e. *esjo tegos. The masculine pronoun *esjo ended in a vowel at every stage of development. As a result, the lenition of the original stop [t] to the fricative [θ], takes place in Stage II in *esjo tegos (25b) and the Old Irish version of this phrase displays [ə 'θⁱeγ]. On the other hand, the ancient phrase *esjo ek^wos shows hiatus between the final vowel of the pronoun and the initial vowel of the noun [ə 'eχ] in Old Irish. These cases demonstrate that a leniting possessive pronoun causes the weakening in the following obstruent (Stage II in (25b)), while no process ever takes place before vowels.

In (25c, d) we can see the feminine version of the possessive pronoun *esja:s (non-leniting). In (25d) there is no lenition of the noun-initial segment of *tegos because the preceding function word ends in a consonant. The pronoun drops this final consonant at Stage III, and yet the intervocalic environment does not affect [t] in *eja: teɣa. This means that Stage III illustrates a phase when lenition is no longer phonological. In (25c) the feminine pronoun contains the spirant [h] (lenited [s]) in final position at Stage II. The third phase shows that the final fricative has not been dropped but is still present within the phrase. These two examples suggest that a non-leniting possessive pronoun does not cause the lenition in the initial consonant of following word, which is predictable, but that it provides the following vowel-initial word with the fricative [h].

This attachment of the fricative [h] to vowel-initial lexical items, traditionally called *h*-prefixation, is frequent in both Old and Modern Irish and is sometimes viewed as a way of avoiding hiatus. This is not the case, though. The developments in (25c) show that this insertion of [h] is by no means accidental and cannot be applied everywhere. In particular, when there is no historical source for the spirant [h], it never surfaces in either Old Irish or its descendants, which is exemplified by [də 'o:r] *do ór* – ‘your gold’, [mə 'i:ask] *mo íasc* – ‘my fish’, in which neither of the two personal pronouns had ever contained the final [h].

The phenomenon of *h*-prefixation is also found in nouns preceded by some non-leniting definite articles. First, consider the development of the nominative plural feminine definite article:

(26)

*sinda:s → *inda:h → *iNda: → *iNda → *iNa → [iNə] (Old Irish)

This article resembles the feminine possessive pronoun *esja:s in the impact exerted on the initial segment of the following word. Relevant stages in the development of two representative phrases of the nom.pl.fem. preceded by the definite article are provided below (McCone 1996: 120).

(27) <i>Stage I</i>	<i>Stage II</i>	<i>Old Irish</i>
a. *iNda:h eledi:h	*iNda: heledi:	[iNə 'h'el'i'd'i] <i>inna eilti</i> – ‘the deer’
b. *iNda:h to:θa:h	*iNda: to:θa:	[iNə 'tuaθa] <i>inna túatha</i> – ‘the tribes’

These cases illustrate exactly the same trend which we observed in (25c, d). *h*-prefixation occurs in Stage II in (27a) when the lexical word begins in a vowel, similarly to *ehja:h eχ^wah → *eja: heχ^wa – ‘her horse’ in (25c). The changes in (27b) are parallel to those in (25d), that is *ehja:h teɣah → *eja: teɣa – ‘her

house'. In (27b) the word begins in a consonant and the presence of [h] blocks lenition at Stage I. During Stage II, when lenition is not phonological any longer, the loss of [h] is of no consequence and the initial stop of the noun [t] survives intact. The changes between Stages I and II are graphically represented below:

(28)	a.	Stage I		Stage II
		O N		O N
		x x	→	x x
				/
iNda: h		e leði: h		iNda: h e leði:
	b.	Stage I		Stage II
		O N		O N
		x x	→	x x
iNda: h		t o: θa: h		iNda: t o: θa:

At Stage I all the fricatives [h] in both (28a) and (28b) become floating. A floating segment can only dock onto an available onset, which takes place at Stage II in (28a). This analysis is identical to that of *t*-prefixation in Modern Irish illustrated in (24). In (28b) the initial onset of the noun is already occupied by [t]. Consequently, the floating fricative [h] is not phonetically realized.

The developments in (25c) and (27a), which show *h*-prefixation to vowel-initial words, suggest that the segment [h] was lexicalized as a word-initial consonant in phrases which originally contained this segment in word-final position. This observation is reinforced by the fact that function words such as the nom.pl. fem. article *sinda:s as well as the feminine pronoun *esja:s successively lost their endings and yet the fricative [h] kept remaining in the phonological phrases until Old Irish (and Modern Irish). Let us recapitulate these changes below:

(29)
 *sinda:s eledði:s → *inda:h eledi:h → (*h*-prefixation) *iNda: heledi: → (final-vowel shortening) *iNda heldi → [iNə ˈhʲelʲdʲi] *inna eilti* – ‘the deer’

Thus, after *h*-prefixation, final vowel shortening took place in the article. This vowel was probably further reduced to schwa in Old Irish. Given that the final [h] was dropped everywhere, e.g. *iNda:h to:θa:h → *iNda: to:θa: – ‘the tribes’,

except before a vowel-initial lexical item, we may assume that this fricative was lexicalized in phrases such as *iNda: heledi: – ‘the deer’ and *eja: heχ^wa – ‘her horse’. The next section will provide more evidence to support this assumption.

2.3.3. *t-prefixation as a consequence of h-prefixation*

We have just seen that the presence of the final [h] is responsible for subsequent *h*-prefixation in vowel-initial lexical items, e.g. *eja:h eχ^wah → *eja: heχ^wa – ‘her horse’. Now let us consider different consequences of *h*-prefixation in other cases. First, let us focus on the nom.sg.masc., which represents the so-called non-leniting environment. The representative examples are juxtaposed with the nom.pl.fem. cases from (27) which are repeated here for convenience.

(30)	<i>Stage I</i>	<i>Stage II</i>	<i>Stage III</i>	<i>Old Irish</i>
a.	*iNdah eχ ^w ah	*iNda heχ ^w a	*iNd heχ	[iN ⁱ t ⁱ eχ] <i>int ech</i> – ‘the horse’
b.	*iNda:h eledi:h	*iNda: heledi:	*iNda heledi	[iNə h ⁱ el ⁱ d ⁱ] <i>inna eilti</i> – ‘the deer’
c.	*iNdah baLah	*iNda baLa	*iNd baL	[iN t ⁱ baL] <i>in ball</i> – ‘the limb’
d.	*iNda:h to:θa:h	*iNda: to:θa:	*iNda to:θa	[iNə t ⁱ uaθa] <i>inna túatha</i> – ‘the tribes’

In (30a, b) we see *h*-prefixation to vowel-initial items in Stage II. No such process certainly takes place in (30c, d) because the nouns begin in consonants. Before Stage III, although the nom.pl.fem. article ends in a long vowel, while the nom.sg.masc. article has a short vowel at the end, the vowel-initial items (30a, b) display identical behaviour (they acquire [h]) and consonant-initial words (30c, d) also act in the same way (they resist lenition). At Stage III, however, the pair-members start behaving differently. In particular, the articles in (30a, c) lose the final short vowel, i.e. *iNda → *iNd, while in the articles in (30b, d) the final long vowels are shortened, i.e. *iNda: → *iNda. These differences have immense impact on the further development of the words in (30a, c). In particular, *iNd baL becomes [iN tⁱbaL] *in ball* – ‘the limb’, while *iNd heχ becomes [iNⁱ tⁱeχ] *int ech* – ‘the horse’ in Old Irish. Note that no further (major) changes affect the phrases in (30b, d).

The change from *iNd baL to [iN tⁱbaL] *in ball* – ‘the limb’ can be accounted for straightforwardly. Following the assumption employed while discussing the absence of *h*-prefixation in (28b), i.e. *iNda:h to:θa:h → *iNda: to:θa: – ‘the tribes’, we can propose the following development of *iNd baL → [iN tⁱbaL]:

(31) *Stage III**Old Irish*

O ₁ N ₁ O ₂ N ₂								O ₁ N ₁ O ₂ N ₂			
x	x	x	x	→	x	x		x	x	x	x
i	N	d	L		i	N		b	a	L	

At Stage III above the article-final stop [d] becomes a floating segment, i.e. a segment without a skeletal position. Since the noun-initial onset (O₁) is already occupied by the stop [b], there is no available onset for [d] to dock onto. As a result, [d] is removed from the representation in Old Irish.

Now let us turn to the more complicated case, that is *iNd heχ → [iNⁱ tⁱeχ] *int ech* – ‘the horse’. Note that the noun-initial [h] is a result of *h*-prefixation at Stage II in (30a), i.e. *iNdah eχ^{wa}h → *iNda heχ^{wa}a. After apocope, that is *iNda heχ^{wa}a → *iNd heχ, the article-final stop [d] and the noun-initial [h] were brought together, which ultimately led to the appearance of [t] in Old Irish.

Looking back at the element make-ups of both [h] and [d], which were proposed in (2.1.4.), we can see that the fricative [h] comprises (H), while [d] consists of (A-I, ?). The element structure of the fortis stop [t], in turn, is (A-I, ?, H). We must conclude that at some point the two sets of primes previously constituting [d] and [h] combined to produce the fortis dental stop [t]. All things considered, we can propose the following detailed derivation of *iNdah eχ^{wa}h → *iNda heχ^{wa}a → *iNd heχ → [iNⁱ tⁱeχ] *int ech* – ‘the horse’, in which the fricative [h] is represented by the high tone element (H), while the voiced stop [d] by (A-I, ?) in the two final stages:

(32) *Initial Stage**h-Floating Stage**h-Prefixation Stage*

O ₁ N ₁ O ₂ N ₂					O ₃ N ₃			O ₁ N ₁		O ₃ N ₃			O ₁ N ₁		O ₃ N ₃			O ₁ N ₁		O ₃ N ₃		
x	x	x	x	#	x	x	→	x	x	#	x	x	→	x	x	#	x	x	→	x	x	
iN	d	a	H		eχ ^w aH			iN	d	a		eχ ^w a			iN	d	a		H	eχ ^w a		
										H			H									

<i>Final Vowel Deletion Stage</i>	<i>d-Floating Stage</i>	<i>t-formation Stage</i>
$ \begin{array}{c} O_1 \ N_1 \quad O_3 \ N_3 \\ \quad \quad \quad \\ \rightarrow x \ x \ # \quad x \ x \\ \quad \\ iN \ d \quad H \ e \ \chi \end{array} $	$ \begin{array}{c} O_3 \ N_3 \\ \quad \\ \rightarrow \# \ x \ x \\ \quad \\ iN \quad H \ e \ \chi \end{array} $ <p style="text-align: center;"><u>A</u>-I ?</p>	$ \begin{array}{c} O_3 \ N_3 \\ \quad \\ \rightarrow \# \ x \ x \\ \quad \\ iN \quad H \ e \ \chi \end{array} $ <p style="text-align: center;"><u>A</u>-I ?</p>

The Initial Stage shows the Insular Celtic form *iNdah eχ^wah. The tone element (H) is associated with the onset position (O₂). During the *h*-floating Stage the onset (O₂) is deleted along with its skeletal position and the prime (H) becomes a floating tone, that is, it is not linked to a skeletal slot. In the *h*-prefixation Stage the floating element (H) docks onto the noun-initial empty onset (O₃). In the Final Vowel Deletion Stage the article-final short vowel is delinked from (N₂), due to which the now article-final [d] and the tone (H) come to stand side by side. At the *d*-floating Stage the onset (O₁) is removed from the representation along with the skeletal slot, as a result of which [d], represented by (A-I, ?), becomes a floating segment, i.e. it is not associated with a position. Finally, the *t*-formation Stage shows that the elements constituting the floating [d] combine with the tone (H) under the noun-initial onset (O₃) to form the voiceless stop [t] in the Old Irish close syntactic group [iNⁱ tⁱeχ] *int ech* – ‘the horse’.

This derivation shows a gradual ‘consumption’ of the article ending by the following noun. First, the final [h] of the article is lexicalized as a word-beginning and then the voiced stop [d] follows suit. Thus, the origin of [t] in vowel-initial stems can be accounted for phonologically because it has a local cause.

If we now return to the derivation of *iNda:h eledi:h → *iNda: heledi: – ‘the deer’, the absence of *t*-prefixation can be easily explained. The development of this phrase was initially identical to that of *iNdah eχ^wah → *iNda heχ^wa – ‘the horse’ because in both cases *h*-prefixation took place. Later on, the behaviour of these two phrases began to differ. Specifically, after *h*-prefixation, the final short vowel of the article was dropped in *iNda heχ^wa → *iNd heχ, as shown in Stage III in (30a). This vowel deletion made it possible for the segments [d] and [h] to stand side by side, fuse and produce [t], i.e. *iNd heχ → [iNⁱ tⁱeχ]. On the other hand, the article-final vowel in *iNda: heledi: was never dropped but only shortened, that is *iNda: heledi: → *iNda heledi, as a result of

which the segments [d] and [h] were never brought together. Thus, the only affixation which ever affected [iNə 'hⁱelⁱdⁱ] *inna eilti* – ‘the deer’ was *h*-prefixation, which is graphically illustrated in (28a).

The fact that there was never any [d] to merge with [h] in the feminine possessive pronoun *esja:s in, say, *esja:s ek^wos → *ehja:h eχ^wah → *eja: heχ^wa → [ə 'heχ] *a ech* – ‘her horse’, accounts for the absence of *t*-prefixation in this context as well.

We will return to the issue of *t*-prefixation while discussing leniting contexts later in this chapter. Now let us conclude that this type of affixation can only take place provided that two conditions are met: first, that *h*-prefixation has already occurred in a vowel-initial stem, and second, that there is a stop [d] immediately preceding the previously prefixed [h] in the phonological representation.

In the ensuing sections we will concentrate on other developments which were triggered by the fact that the high tone (H) became a floating object at some point in the prehistory of Irish.

2.3.4. *The floating high tone and the origin of the Irish [f]*

Now we will see that the floating tone (H), which has an important role in the pre-Old Irish *h*-prefixation and *t*-prefixation, also participates in another development in the prehistory of Irish. While discussing the details of lenition in Old Irish, it was stated that the segment [f] can basically be either an independent sound occurring word-initially or a product of the lenition of [p]. The first one was said to be special in that, unlike all the other consonants which lose one element due to lenition, it loses two primes and becomes inaudible, for instance [fⁱð]/[də 'ið] *fid/do fid* – ‘wood’/‘your wood’. The origin of this Old Irish fricative has received attention from scholars such as Watkins (1966), Cowgill (1967), Uhlich (1995), McCone (1996), and many others.

It is commonly held that, at the time when lenition was phonological, that is in prehistory, the system of Irish did not include the sound [f]. There were two reasons for this state of affairs.

First, the Old Irish [f] can be a segment obtained due to the lenition of [p], e.g. [pⁱian]/[ə 'tⁱian] *pian/a p(h)ian* – ‘punishment’/‘his punishment’. However, there was no descendant of the PIE sound [p] in Celtic until the introduction of loanwords, which took place later than the phonologically motivated lenition (McCone 1996:129). Thus, no [f] could be had as a result of weakening in early Primitive Irish. When Latin borrowings had already become part of the Irish lexicon, which was when lenition had been grammaticalized, the labial stop [p] underwent lenition similarly to the other obstruents and became [f] (McCone 1996:137).

Second, the other Old Irish [f] can be found either in non-leniting morpho-syntactic environments (e.g. after non-leniting function words as in [iNⁱ tⁱer] *in fer* – ‘the man’) or word-initially (without any item preceding it in sentences, e.g. [fⁱer] *fer* – ‘man’). This fricative was absent from the Insular Celtic and early Primitive Irish inventory or, to be more precise, its predecessor existed in the shape of [w].

This PIE semi-vowel or glide developed in three ways in late Primitive Irish (McCone 1996). In close contact with a voiced consonant or sonorant it turned into [v], e.g. *widwā → [fⁱedəv] *fedb* – ‘widow’, *arwar → [arvər] *arbar* – ‘grain’. This was also the case across word-boundaries, e.g. *indan weran → *iNdan veran → *iNda vera → [iNə vⁱer] *inna fer* – ‘of the men’. Intervocally, both within single words and across word boundaries, it disappeared, e.g. *druwi → *druy → [drui] *druí* – ‘druid’ and *ehja wosto → *eja wosso → [ə ‘os] *a foss* – ‘his servant’. These developments are obviously connected with phonological lenition which affected the glide [w] late in Primitive Irish or early in Old Irish. Thirdly, in non-leniting or independent (word-initial and sentence-initial) contexts, this semi-vowel surfaced as [f]. The difference between the non-leniting contexts and independent positions will be shown to be of importance below.

As for the element make-up of this prehistoric [w], it is more than likely that it contained the prime (U). Above all, the segment [w] is a labial and it is the element (U) that defines the labial place of articulation in GP. Moreover, [w] is a development of the PIE consonantal *u (Thurneysen 1946:122). Bearing this historical and structural information in mind, we can tentatively assume that when [w] became [v] after a voiced consonant, the change possibly consisted in the acquisition of headship by the element (U), that is (U) → (U).¹⁸

As regards leniting contexts, all consonantal segments (except sonorants *l, r, n*) lost one prime when weakened intervocally. After the leniting age, the newly borrowed segments, such as [p], followed suit and lost one element in historically determined weakening contexts. Given that [w] equals (U), it is hardly surprising that, when lenited, this segment had no elements left to remain pronounceable. Thus the lenition of [w] into \emptyset can be represented as (U) → (). This historical phonological process indirectly accounts for the deletion of [f] in weakening environments in Old Irish. In other words, the lenition of [w] was lexicalized when the process of weakening was no longer active. Subsequently, when [f] replaced [w] word-initially, its structure was totally unimportant to the system which treated this segment as one to be deleted in a leniting context.

¹⁸ A similar change of w → v, involving the acquisition of headedness, is also observed by Cyran and Nilsson (1998:96) in Slavonic languages.

It is the non-leniting environment, however, that is most intriguing and spectacular. McCone (1996:131) observes that, fairly long after the period of phonological lenition, the system allowed the alternation between the original [w] and the voiceless fricative [f]. Below we will see the behaviour of the prehistoric glide [w] in two contexts: leniting in (33a) and non-mutating in (33b). Consider the following examples:

(33)	<i>Stage I</i>	<i>Stage II</i>	<i>Old Irish</i>	
a.	*iNdi: wiri:	*iNdi iri	[iN ⁱ 'd ⁱ ir ⁱ]	<i>ind fir</i> – ‘of the man’ gen.sg. LENITION
b.	*iNdah werah	*iNda fera	[iN ⁱ 'f ⁱ er]	<i>in fer</i> – ‘the man’ nom.sg. NO MUTATION?
	*werah	*wera	*wer/[f ⁱ er]	<i>fer</i> – ‘man’ nom.sg. NO MUTATION

These stages present the developments of the ancient glide [w] in (apparently) two different environments. At Stage I all the forms of the noun display the initial glide [w]. The example in (33a) shows its intervocalic lenition to zero at Stage II, i.e. *iNdi: wiri: → *iNdi iri. Any [w] which had developed into neither [f] nor [v] was lost in that period (Kortlandt 1979:48ff.; McCone 1996:131). Later on, the final vowels of both the article and the noun were dropped, as a result of which the Old Irish form was [iNⁱ 'dⁱirⁱ] *ind fir*. At Stage II the examples in (33b) show a discrepancy between the non-mutating context after the definite article (or any closely connected preceding word) and a pure non-weakening environment, i.e. one without any preceding words. In particular, the original glide [w] in *wer, which is not preceded by any other item, remains intact for a long time until it is replaced by [f] in Classical Old Irish (McCone 1996:131). The development of *iNdah werah → *iNda fera, however, shows that [w] changes to [f] in the non-mutating context where we observed *h*-prefixation in the preceding sections. Let us focus on these two developments now.

The fact that the context-free variant *wer was present in the lexicon along the structure [iNⁱ 'fⁱer] until Early Old Irish (as shown in (33b)) suggests that the nominal form with the initial [f] was originally a context-dependent derivative, that is a variant which occurred only in specified environments. Explicitly, the radical segment was still [w], the lenited version was zero, while the variant occurring in *h*-prefixing contexts was [f]. Below we will compare the developments of the prehistoric glide [w] as a context-free segment and as one in the *h*-prefixing context. First, let us see a detailed derivation of the context-independent form *wer based on McCone (1996:131) graphically represented below:

(34) <i>Stage I</i>	<i>Stage II</i>	<i>Stage III</i>
O N O N x x x x w e r a H	O N O N x x x x w e r ə	O N O N x x x x w e r

At Stage I, which historically corresponds to the period just after phonological lenition, the only change is that the final fricative (high tone) is delinked from the representation. In the second phase this context-free noun has already lost the consonantal ending [h], while in Stage III the noun has undergone apocope (final vowel deletion). What is worth noting is that no change at all has been observed in the initial glide, it has remained intact until it is replaced by [f] in Early Old Irish. The nature of this replacement will be discussed soon.

Now let us turn to the context-dependent version of this word where the noun is preceded by the definite article ending in the fricative [h], i.e. *iNdah werah. The glide [w] is represented as the element (U), while the fricative [h] by (H) in the following derivation:

(35) <i>Stage I</i>	<i>Stage II</i>
O N O N x x x x i N d a H U e r a H	O N O N x x x x i N d ə U e r ə H

In Stage I the article-final [h], represented by the high tone (H), becomes a floating segment, similarly to the final segment of the noun. Stage II shows that the tone element (H) has been harboured by the noun-initial onset and has combined with the prime (U), previously determining the quality of this onset. As a result, the structure (U, H) is realized as [f], or, perhaps [ϕ]. It is likely that between Stages I and II above, the newly formed spirant [f] for some time occupied two consecutive onset positions before the structure was simplified through merger.

The changes illustrated in (34) and (35) show that there are two non-leniting contexts which differ with respect to the influence they exert on the prehistoric glide [w]. In the context-dependent, non-leniting and *h*-prefixing environment, i.e. *iNdah werah, where the ancient glide was preceded by the floating tone,

the origin of the segment [f] finds phonological explanation. The other situation, namely the context-independent non-leniting environment **werah*, cannot be accounted for in terms of phonology because the change of [w] to [f] occurs without a local cause (there is no preceding [h] or anything else). McCone (1996:131), following Watkins (1966:70-71), notes that [w] in unlenited initial position (**wer*) was replaced by the context-dependent variant [f] “under analogical pressure from the normal alternations” typical of the other obstruents. For example, the word *corp* appears with its radical initial consonant as [korp] *corp* – ‘body’ and as [iNⁱ korp] *in corp* – ‘the body’ when preceded by the definite article. Both the radical [k] and the unlenited [k] are identical. Analogically, the initial consonant in the unlenited variant of [iNⁱ tⁱer] *in fer* – ‘the man’, should also surface as [tⁱer] *fer* – ‘man’ without any preceding items.

A reverse situation, i.e. that the newly formed context-dependent version [f] is abandoned, is theoretically possible. However, given that the glide [w] was generally on the wane in late Primitive Irish and Early Old Irish, it is hardly surprising that this semi-vowel was eradicated as soon as an appropriate substitute appeared in the system. It is also worth noting that in nasalizing contexts, where radical fortis obstruents occurred as lenis, e.g. radical [k] surfaced as [g], the glide [w] appeared as [v], e.g. *iNdan *weran* → *iNdan *veran* – ‘of the men’. Thus, it must have been more natural for the phonological system of Irish at that time to accept the new opposition between [f] and [v] than that between [w] and [v]. The behaviour of [w] in nasalizing contexts is dealt with later in this chapter.

Therefore, we can conclude that the change of [w] to [f] in context-free position (**wer*) is merely a replacement of the radical segment by a mutated (i.e. strengthened) one and has nothing to do with regular phonological development, unlike the spirantization of [w] to [f] in [iNⁱ tⁱer].¹⁹

In the ensuing section we will investigate another phenomenon involving the merger of the high tone (H) and the prehistoric glide [w].

2.3.5. *The high tone and the lenition* [s → f]

While describing Old Irish lenition in (2.1.3.) and (2.1.4.) we noted a peculiar weakening of [s] to [f]. It was observed then that [f] sometimes replaces [s] in leniting contexts, e.g. *siur* – ‘sister’ when lenited, becomes *fiur*, while *sesser* – ‘six people’ turns into *fesser* in a weakening site (Thurneysen 1946:84). Being totally irregular when approached synchronically, this development can also be accounted for phonologically if viewed from the historical perspective.

¹⁹ The replacement of a radical segment by a mutated variant is not infrequent in Celtic languages. See e.g. Ball and Müller (1992) and Figiel (2002) for ‘re-radicalization’ in Welsh and Irish, respectively.

Below we will see the prehistoric developments of the cluster [sw] in an independent no-mutation context and in a leniting environment with a view to finding a local source for the occurrence of [f] in the latter. Consider the following derivations taken from McCone (1996:105, 120):

(36) <i>Stage I</i>	<i>Stage II</i>	<i>Stage III</i>	<i>Old Irish</i>	
a. CONTEXT-FREE DEVELOPMENT				
*swess	*sweh	*se:	[s ⁱ e:] sé	– ‘six’
*swesur	*swehur	*siur	[s ⁱ iur] <i>siur</i>	– ‘sister’
b. DEVELOPMENT IN LENITING CONTEXTS				
*esjo swesur	*ehja hwehur	*eja fiur	[ə f ⁱ iur] <i>a fiur</i>	– ‘his sister’

In (36a) the context-free development of forms with the original word-initial cluster [sw] is illustrated. In Stage II we observe the phonological lenition of [s] to [h] in medial position in *swehur and in final position in *sweh. There is no initial lenition of [s] because no weakening context is involved. More importantly, Stage III reveals the simplification of the initial cluster to [s] alone.²⁰ This variant of the segment survives until Old Irish and, subsequently, until the present. In (36b) the leniting context is shown in Stage II. The cluster [sw] is lenited to [hw], which produces the single segment [f] in the third phase and, ultimately, in Old Irish.

The immediate vicinity of both [h] and [w], which led to the following development into [f], bears a striking resemblance to what we witnessed in the case of *iNdah werah → *iNdə fera – ‘the man’. The only difference is that in *ehja hwehur → *eja fiur we are dealing with this spirant-glide sequence within one word. It has already been demonstrated, however, that close syntactic groups which constitute phonological phrases behave similarly, if not identically, to phonological words and that morphological boundaries are of no importance. Therefore, if the cluster simplification occurred despite morphological boundaries in *iNdah werah → *iNdə fera – ‘the man’, the same process must have occurred within a morphologically simplex unit like *hwehur provided that it found itself in a leniting context. Consider the simplified development of the PIE cluster [sw] below in the phrase *esjo swesur → *ehja hwehur → *eja fiur. The segments [h] and [w] are represented by the phonological elements (H) and (U), respectively, at the word-beginning:

²⁰ This loss of [w] is a regular development which took place between Primitive Irish and Early Old Irish. Let us recall that [w] which had not changed into either [f] or [v] was regularly dropped in that period except in context-free word-initial position.

(37) <i>Initial Stage</i>	<i>Lenition Stage</i>	<i>Simplification Stage</i>
<div style="display: flex; justify-content: space-around;"> <div> O N O N x x x x esjo s U e surr </div> <div>→</div> <div> O N O N x x x x ehja H U e hurr </div> <div>→</div> <div> O N x x eja U i ur H </div> </div>		

The Initial Stage shows the situation from before lenition, where the initial segment is still [s]. During the Lenition Stage above the tone element (H) and the labial prime (U) belong to two different skeletal slots, the result being the cluster [hw]. In the Simplification Stage these two primes merge under one position and are realized as one segment [f].

It transpires, then, that what used to be a purely phonological process in prehistory, was totally obscured in Old Irish. In this system we can only speak of the functional replacement of some *s*'s by some *f*'s in particular contexts. In other words, the prehistoric regular lenition of the original [sw] to [hw] and the subsequent merger to the spirant [f] became lexicalized in specific grammatical contexts in or before Old Irish.

In the ensuing section we will try to come to grips with another controversial phenomenon, namely the strengthening of original lax sonorants in non-leniting environments. Also there we will be making a clear distinction between two no-mutation contexts. One will be referred to as *h*-prefixing because in this environment vowel-initial stems are provided with the initial [h], e.g. *iNda^h eχ^wah → *iNda heχ^wa – ‘the horse’, and [f] is formed due to the merger of [h+w], e.g. *iNda^h werah → *iNdə fera – ‘the man’. The other one is a truly independent initial environment, that is, without any preceding items.

2.3.6. The high tone and the origin of the Irish tense sonorants

As already mentioned, the sonorants occurred in two variants in Old Irish: as tense (strong) segments [R, L, N], and as lax (weak) expressions [r, l, n].²¹ It is also commonly held that, word-initially, the weak series occurred in leniting contexts, while their strong congeners surfaced in non-leniting environments.²²

²¹ The nasal stop [m] is not normally treated as a sonorant but as a stop because, like all the other stops, in prehistory it underwent intervocalic weakening to the fricative [v̥].

²² Tense sonorants also occurred in nasalizing contexts. These will be discussed later on.

Below, we will compare the tense sonorants in no-mutation sites with the lax ones in weakening environments:

(38) WITH A PRECEDING FUNCTION WORD CONTEXT-FREE OCCURRENCE

a. *Non-leniting Contexts*

[ə 'La:ĩ]	a l(l)ám	– ‘her hand’	[La:ĩ]	lám	– ‘hand’
[ə 'Ri:]	a r(r)í	– ‘her king’	[Ri:]	rí	– ‘king’

b. *Leniting Contexts*

[ə 'la:ĩ]	a lám	– ‘his hand’
[ə 'ri:]	a rí	– ‘his king’ ²³

In (38b) we observe the lax resonants after leniting function words, e.g. [ə 'la:ĩ] – ‘his hand’. In (38a) the tense sonorants occur after non-leniting function words (i.e. in *h*-prefixing contexts), e.g. [ə 'La:ĩ] – ‘her hand’ and without any closely connected preceding items, e.g. [La:ĩ] – ‘hand’. It will be shown soon that these two no-mutation contexts are not identical.

Viewing the tense-lax pairs of sonorants from the Old Irish perspective alone, as we did in (2.1.4.), one must conclude that the tense series are radical, while the lax ones are contextually weakened. However, the history of resonants indicates that this need not be the case. In particular, there is no evidence to counter the view that there were only lax series in PIE and all the Old Irish tense resonants historically derive from these lax expressions (Lewis and Pedersen 1974; Kortlandt 1979; McCone 1996), although there is no agreement among scholars as regards the time and circumstances when that tensing occurred.

According to McCone (1996:82, 84, 96ff.), who is one of the few who try to date exactly the transformation of these lax segments into tense, the strengthening (tensing) of the original lax resonants probably took place in Insular Celtic, which was when Proto-Celtic had split into Continental Celtic and Insular Celtic. We are interested in the insular branch here. That was the time when the voiced stops had already been affected by lenition and when [s] was also undergoing weakening. Taking into account these chronological assumptions and the proposal that the development of tense sonorants from their lax congeners was confined to all non-leniting contexts, let us consider the original lax sonorant transformations in two no-mutation contexts: after non-leniting (*h*-prefixing) function words (39a), and without any preceding items (39b). On the other hand, (39c) shows no transformation in typical leniting environments.

²³ We assume that the initial [R] and [r] are non-palatalized, like in Modern Irish.

(39)	<i>Stage I</i>	<i>Stage II</i>	<i>Stage III</i>	<i>Old Irish</i>
a.	*sindos ri:s	*indah Ri:h	*iNda Ri:	[iN 'Ri:] – ‘the king’
	*esja:s la:ma:	*ehja:h La:~va:	*ehja: La:~va:	[ə 'La:~v] – ‘her hand’
b.	*ri:s	*Ri:h	*Ri:	['Ri:] – ‘king’
	*la:ma:	*La:~va:	*La:~va:	[La:~v] – ‘hand’
c.	*sindi: ri:gos	*indi: ri:yah	*iNdi ri:ya	[iN ⁱ d ri:γ] – ‘of the king’
	*esjo la:ma:	*ehja la:~va:	*ehja la:~va:	[ə 'la:~v] – ‘his hand’

In Stage I in (39a) we can see the Proto-Celtic forms with the final unlenited variant of [s] in the definite article and the possessive pronoun as well as the noun-initial lax sonorants. Stage II represents the Insular Celtic period when both the lenition of [s] to [h] and the tensing of the resonants have taken place, e.g. *indos ri:s → *indah Ri:h – ‘the king’. The third phase shows that, after the dropping of [h], which previously terminated the function words, the sonorants are still tense, like in Old Irish. In McCone’s (1996) approach, the context-free developments in (39b) are identical to those in (39a). (39c) shows leniting environments, i.e. after a vowel in the closely connected preceding item, in which nothing ever happened to the original noun-initial lax sonorants: they entered Old Irish intact.

Thus, the only condition to be met for the tensing to take place at Stage II in (39a) is that what precedes the original lax resonants must not be a vowel and their fortition seems spontaneous in (39b), where they do not follow any closely connected word.

Now, given that in the prehistory of Old Irish many developments taking place at word-boundaries seem to have had a phonological (i.e. local) cause, e.g. *h*- and *t*-prefixation, the origin of [f], and the changes to be discussed below, it is peculiar that the tensing of sonorants was totally dissimilar in this respect. Bearing this in mind, let us investigate further developments.

The Insular Celtic period preceded another crucial division, namely the split into Primitive Irish and Primitive (or Proto-) Welsh. This may also be called a separation of two geographically distinct dialects, that is Goidelic (Irish) and Brittonic (Welsh). Thus, when lax sonorants were tensed, there was probably no distinction between Irish and Welsh in the treatment of these segments. Interestingly, in Modern Welsh (and in the history of Welsh) the opposition between the unlenited and lenited liquids manifests itself in the aspiration (voicelessness) of the former (Ball and Müller 1992, Buczek 1995). In terms of elements, the tense liquids can be said to contain the prime (H), as suggested by Cyran (2003: 69). The fact that the Welsh reflexes of Insular Celtic forms display voiceless-

ness in sonorants (e.g. the Old Irish for ‘her hand’ is [ə ‘La:ĩṽ] while the Middle Welsh is [i ‘law]), may be viewed as irrelevant, but it may also indicate that at the beginning of Insular Celtic all sonorants were lax and it was only after the dropping of the preceding [h], whose element structure contains only (H), that they acquired the property of tenseness or voicelessness. Thus it is possible that, after a few centuries of separation, the Welsh reflexes of these sonorants were voiceless, while in Irish the effect was different. We shall return to the development of sonorants in Welsh soon.

Stage II in (39) above is based upon reconstructions proposed by McCone (1996:84, 120ff.), but even he admits that the final *-h* of, say, *ehja:h (feminine possessive pronoun) was “lost in various ways”, whereas Kortlandt (1979:47) argues that this loss was a gradual process. This means that *-h* may have been lost in different periods before different consonants, which is compatible with the hypothesis that phonological lenition was not a process which affected all consonants at the same time. Let us recall that, roughly, the first lenition affected voiced stops, the result of the second was the weakening of [s], while the third weakened voiceless stops (as shown in (19) above). This also indicates that the transition from phonological lenition to functional (grammatically motivated) weakening could have varied depending on the particular segment or group of segments. Consequently, the fact that sonorants were strengthened in Insular Celtic while the period of *h*-dropping was accomplished in Primitive Irish need not automatically mean that the strong variants of sonorants and the preceding [h] stood side by side at exactly the same time. It is not impossible, then, to hypothesize that the loss of the final *-h* contributed to the development of tense sonorants. Such a view would not be unprecedented since the relevant literature offers a similar proposal. In particular, Kortlandt (1982:81) argues that in close syntactic groups the resonants were geminated at the expense of the disappearing *-h*, or that this spirant was assimilated. Accepting this opinion would amount to saying that tenseness means gemination in the case of word-initial (doubly written) sonorants in *h*-prefixing contexts.

This, in turn, can find support in the interpretation of double resonants in other word positions, i.e. word-medial and final, as geminates (e.g. Thurneysen 1946; Greene 1956).²⁴ Without taking sides at this stage, let us consider the following examples of word-medial and final tense sonorants in Old Irish compared with their lax counterparts:

²⁴ Tense and lax sonorants also occur in consonant clusters. These are discussed in detail in Chapter Three.

(40)	a. <i>Tense</i>	b. <i>Lax</i>
	[b ⁱ eN] <i>benn</i> – ‘peak’	[b ⁱ en] <i>ben</i> – ‘woman’
	[k ⁱ e:L ⁱ e] <i>céille</i> – ‘sense’-gen.sg.	[k ⁱ e:l ⁱ e] <i>céile</i> – ‘companion’
	[koR] <i>corr</i> – ‘heron’	[kor] <i>cor</i> – ‘act of putting’

The examples above show two things. First and most obvious, that tenseness is contrastive. Second, that tense sonorants are mostly written double in Old Irish, which is also true of word-initial sonorants in close syntactic groups. Prehistoric developments of the Old Irish tense resonants, which are shown below, are also revealing:

(41)	
*banna:	→ *baNa → [b ⁱ eN] <i>benn</i> – ‘peak’
*karros	→ *kaRa → [kaR] <i>carr</i> – ‘wagon’
*ballos	→ *baLa → [baL] <i>ball</i> – ‘limb’

Vowel changes apart, it transpires that, historically, the Old Irish tense sonorants in intervocalic contexts were double consonants or, simply, geminates. A CV-based structure of a geminate contrasted with that of a single consonant proposed in Chapter One is repeated below for convenience:

(42)	a. <i>Geminate</i>	b. <i>Single consonant</i>
	O N O N	O
	x x x x	x
	↘ ↗	
	β	β
		β = any consonantal segment

The structures in (42) show that geminates are attached to two consecutive onset positions, whereas single consonants occupy one. These schematic representations of consonants are parallel to those of long and short vowels, respectively. While proposing element structures of Old Irish sonorants in (2.1.4.), we observed that the tense-lax dichotomy present in sonorants has a mirror image in tense and lax vowels in some languages. In English, for example, the tense vowels are long, while the lax ones are short. Consider the following pair *beat* – *bit* illustrating the difference in structure between the English tense and lax vowels.

(43)	a. <i>Tense</i>	b. <i>Lax</i>
	O N O N O N	O N O N
	x x x x x x	x x x x
	\ /	
	b i: t	b ɪ t

The similarity between the structure of the long vowel in (43a) and that of a geminate in (42a) is striking. Thus, if tenseness is a possible property of a given segment, double linking is able to provide this feature. Moreover, the English vowels are considered to be headed when long and tense, e.g. [i:] is (I) whereas the lax ones are regarded as headless, e.g. [ɪ] equals (I). This is exactly what was proposed in (2.1.4.) for the Old Irish tense and lax sonorants, e.g. the tense [R] = (A), while the lax [r] = (A). Given all these structural and element assumptions, it seems that gemination, headedness and tenseness are all interdependent. In particular, a resonant (structurally) attached to two positions is (articulatorily) tense and (elementally) headed, just like a tense long vowel.

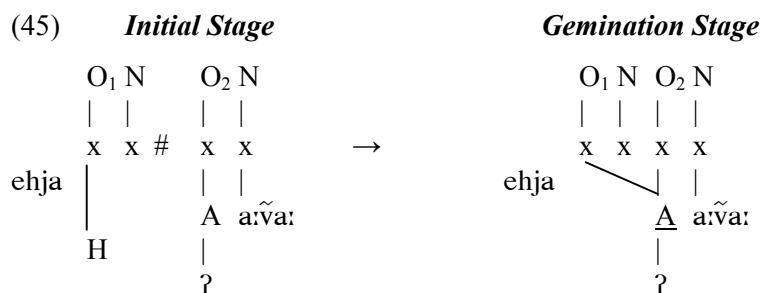
It may be, then, that the Old Irish medial and final tense sonorants which derive from double segments, e.g. *banna: → *baNa → [bⁱeN] *benn* – ‘peak’ have geminate structure like that shown in (42a). A detailed analysis of tense sonorants in this position is provided in Chapter Three.²⁵ Now, assuming that geminate structure occurs non-initially in Old Irish, we can suspect that word-initial tense resonants which surfaced in *h*-prefixing contexts in prehistory display the same structure. Such a quantitative interpretation requires a historical reinterpretation of the changes shown in (39).

Unlike McCone (1996), below we propose that the original lax word-initial resonants were not always tensed spontaneously. On the contrary, their phonologically triggered tensing occurred when the final *-h* of the closely connected preceding word had been lost (i.e. in *h*-prefixing contexts), while unmotivated tensing took place only when nothing preceded a word-initial resonant:

(44) <i>Stage I</i>	<i>Stage II</i>	<i>Stage III</i>	<i>Old Irish</i>
a. *sindos ri:s	*indah ri:h	*iNda Ri:	[iN 'Ri:] – ‘the king’
*esja:s la:ma:	*ehja:h la:~va:	*ehja: La:~va:	[ə 'La:~v] – ‘her hand’
b. *ri:s	*ri:h	*Ri:	['Ri:] – ‘king’
*la:ma:	*la:~va:	*La:~va:	[La:~v] – ‘hand’

²⁵ There we also offer an analysis of the so-called Modern Irish vowel lengthening before tense sonorants.

In this reconstruction of sound changes we can observe that at Stage II in (44a) the noun-initial liquids were still lax. In Stage III, the sonorants were already tense, but the preceding [h] had been dropped. It should be emphasized that such an interpretation cannot be proved either right or wrong, but it is by all means likely. On the other hand, (44b) shows the spontaneous fortition of the initial sonorants without any preceding items, i.e. without any phonological context. We will return to this strengthening soon. Now consider the graphically represented change from *ehja:h la:~va: → *ehja: **La:**~va: – ‘her hand’, where the gemination of the original lax sonorant (represented by (A, ?)) at the expense of the deleting spirant [h] (the prime (H)) is shown.



The Initial Stage in (45) shows the final high tone (H) in the article. In the Gemination Stage this tone is dropped but the vacated onset (O₁) is taken over by the melody (A, ?) from the following onset (O₂). Consequently, the doubly linked structure (A, ?), now a headed expression, surfaces as the tense sonorant [L]. By analogy, the other lax liquid [r], which contains the elements (A), after the spreading to an empty onset position is doubly linked and realized as tense [R] with the structure of (A), e.g. *indah ri:h → *iNda Ri: – ‘the king’.

It seems logical to assume that, apart from acquiring the property of tenseness, the bi-positional sonorant becomes a headed expression. Later on, that is in Old Irish or just before this period, the reinterpretation of sonorant strength previously determined by geminate structure may have resulted in the simplification of this structure to a headed but mono-positional object. Another reason why the word-initial tense sonorant in connected speech should be perceived as doubly linked until the period of Old Irish will be provided when we start dealing with leniting environments and pre-Old Irish adjustments.

Now let us return to the development of the ancient lax resonants in the Brittonic (Welsh) branch of Insular Celtic, which may help us understand why the development of Goidelic sonorants following [h], as suggested in (45), was not identical to that of [w] following [h], e.g. *iNdah werah → *iNdə fera – ‘the

man'. In the case of [w] after [h], the elements of both these segments merged to produce one segment [f], i.e. (H)+(U) = (U, H), while in the ancient Irish sonorants following [h], the element content of the final fricative had no impact on the quality of the tense sonorant.

In Brittonic the prehistoric lax resonants display voicelessness in exactly the same environments in which their Irish cousins show tenseness. This happens both in independent initial position (without any preceding words, e.g. the Old Irish for ‘hand’ is [La:̃v̥] whereas the Middle Welsh is [ɭaw]) and in contexts with the preceding [h] (e.g. the Old Irish for ‘her hand’ is [əˈLa:̃v̥] while the Middle Welsh is [iˈɭaw]). We can speculate that these two related languages developed their sonorants in independent, although not entirely dissimilar ways. Consider the representations of the Middle Welsh reflex of the Insular Celtic form of *ehja:h la:̃va: → [iˈɭaw] – ‘her hand’. For the sake of clarity, the transformation in (46) is extremely simplified in that the intermediate stages consisting in vowel reduction, vowel loss etc. have been disregarded.

(46) *Insular Celtic* \rightarrow *Middle Welsh*

	O ₁ N	O ₂ N		O ₁ N	O ₂ N
	x x #	x x		x x	x x
ehja			\rightarrow	i	
		A aw			A aw
	H				
		?			?
					H

In Insular Celtic the pronoun ends in the fricative [h] under the onset (O₁). This spirant is represented by the high tone element (H). The liquid [l] under (O₂) is lax and its element structure is (A, ?). In Middle Welsh the tone (H) merges with the elements previously constituting the lax [l], as a result of which the voiceless sonorant [ɬ] with the element content (A, ?, H) is formed. It is proposed in (46) that this segment has geminate structure (O₁O₂), which means that the new expression [ɬ] incorporates both the melody and the structure of two ancient segments: [h] and [l]. In melodic terms, this situation is parallel to that observed in the case of [h]+[w] = [f] in (2.3.4.). This is not the only possible interpretation, however. We may also speculate that there was no gemination at all and that in Brittonic the origin of voiceless resonants is parallel to the creation of [f] in Goidelic in structural terms as well. This is proposed below:

(47)	<i>Insular Celtic</i>	→	<i>Middle Welsh</i>
	O ₁ N O ₂ N		O ₂ N
	x x # x x	→	x x
ehja		i	
	A aw		A aw
	H		
	?		?
			H

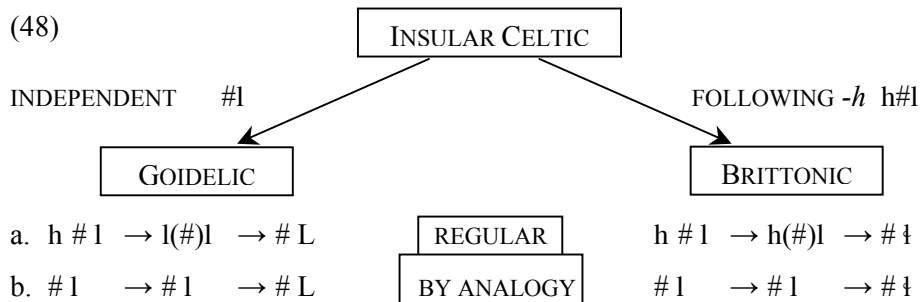
The Insular Celtic Stage shows the two onsets (O₁) and (O₂) occupied by [h] and the lax [l], respectively. In Middle Welsh the high tone prime has been delinked from its position (O₁) and has joined (O₂). Now the melody under (O₂) is enhanced by the prime (H), while (O₁), as an empty onset preceding an empty nucleus, has been removed from the representation.

What we have seen so far is that there is a slight difference in the treatment of the high tone (H) which previously terminated the possessive pronoun. On the one hand, in Brittonic the newly formed sonorant segment incorporates the element (H) previously attached to another position. This process may but need not have resulted in gemination. On the other hand, in Goidelic gemination did not entail the absorption of that tonal prime but the double linking provided the resulting sonorant with the property of tenseness.

What is also common to both Irish and Welsh is that the original lax sonorants in independent initial position (i.e. without any preceding items) were re-interpreted as tense (Irish) or voiceless (Welsh) at some period without any local cause. In particular, what used to be a lax sonorant in, say, the Insular Celtic *landa: – ‘land’, was turned into a tense resonant [L] in Irish (i.e. [LaNd] *land*) and into a voiceless liquid [ɬ] in Welsh (i.e. [ɬan] *llan*). The same is to a certain extent true of the Old Irish [R] and the Middle Welsh voiceless [r^h] or [ɾ]. If the hypothesis that sonorants were doubly linked in connected speech (i.e. following the final *-h*) is accepted, the development of tense sonorants from the lax ones looks similar but not identical to that of [f] from [w], where the originally radical segment [w] was replaced by one which resulted from fortition in the vicinity of the final *-h*, e.g. *iNdah werah → *iNdə fera → [iNⁱ ʔⁱer] – *in fer* ‘the man’. However, there was neither any phonological source for the change of [w] into [f] nor for the double linking of sonorants when these occurred without any preceding items.

Let us recall that forms such as *wer – ‘man’ and [iNⁱ tⁱer] *in fer* – ‘the man’, the former context-independent while the latter historically following *-h*, were both present in the language for some time before the version with the fortis spirant [f] came to be perceived as the radical form, i.e. *wer → [fⁱer] *fer* – ‘man’. So, the radical [w] was reinterpreted as [f] by analogy with [f] which was formed in *h*-prefixing environments. We have argued that the original lax sonorants were tensed also in *h*-prefixing contexts. Given the similarity between the origin of [f] and the tense (or, in Welsh, voiceless) sonorants, analogical reinterpretation of radicals may have affected also the original lax sonorants in independent initial position. Thus the predecessors of the Old Irish forms such as [ə 'Ri:] *a r(r)i* – ‘her king’ and [iN 'Ri:] *in r(r)i* – ‘the king’, in which the sonorant became tense as a result of being doubly linked, as shown in (45), probably gave rise to the spontaneous strengthening of the same resonant in a context-independent form like [Ri:] *rí* – ‘king’ (Welsh [r^hi] *rhi*). The same pattern is observed in the Middle Welsh [ʰoŋ] *llong* vs. Old Irish [Loŋ] *long* – ‘ship’ and the Middle Welsh [ʰiw] *lliw* vs. Old Irish [L^hi:] *lí* – ‘colour’.

To sum up, in Insular Celtic the original sonorants were lax. There was also a clear distinction between two types of non-mutating contexts: independent word-initial position (#l) and word-initial context following *-h* in connected speech (h#l). When the division into Irish and Welsh had occurred, the lax resonants in *h*-prefixing contexts were geminated in Goidelic and (probably) Brittonic. In the former system they became tense, e.g. [l] → [L]. In the latter they surfaced as voiceless, e.g. [l] → [ʰ]. Later on, contexts (h#l) came to be treated on a par with contexts (#l). As a result, the reinterpretation of the radical segments took place and all the sonorants in all nominally non-mutating environments were realized as tense (Irish) and as voiceless (Welsh). This is schematized below:



where [l] stands for sonorant ²⁶

²⁶ In fact, in Welsh this symbol stands for liquids only because the IE nasal *n did not develop its voiceless counterpart in the environments described above.

This diagram shows clearly what happened to original PIE lax resonants in *h*-prefixing environments (48a) and in absolute initial position (48b). In both Brittonic (voicelessness) and Goidelic (tenseness) was connected with the gemination of the original lax sonorants at the expense of the deleting final *-h*. This gemination took place only in *h*-prefixing contexts shown in (48a). (48b) shows that the reanalysis of the original radical sounds occurred in context-independent position in both languages by analogy with the *h*-prefixing environments.

2.3.7. Non-leniting environments – summary

The aim of this discussion was to demonstrate that connected speech had immense impact on the treatment of various radical consonants and the ultimate shapes of word-forms and phrases in Old Irish. In the few sections above we were dealing with four types of adjustments which occurred in the so-called non-leniting environments in the prehistory of Irish: *h*-prefixation, *t*-prefixation, the origin of [f] and the tensing of PIE sonorants.

First, we saw that the phenomenon of *h*-prefixation and the successive developments were responsible for the occurrence of *t*-prefixation in Old Irish and, subsequently, Modern Irish. In particular, the word-final sound [h] was attached to vowel-initial stems of the closely connected following words and lexicalized there as a word-beginning, e.g. *ehja:h eχ^wah → (*h*-prefixation) *eja: heχ^wa → [ə 'heχ] *a ech* – ‘her horse’. The lexicalization of the fricative [h] word-initially led to the merger of this segment with [d], if this stop was locally available, which resulted in the so-called *t*-prefixation, e.g. *iNda:h eχ^wah → (*h*-prefixation) *iNda heχ^wa → (*h*-lexicalization) *iNd heχ → (merger of d+h=t) [iNⁱ 'tⁱeχ] *in t-ech* – ‘the horse’. Next, we analyzed the development of the prehistoric labial glide [w] into the fricative [f] in connected speech in contexts following the word-final [h], e.g. *iNda:h werah → *iNdə fera → [iNⁱ 'tⁱer] *in fer* – ‘the man’. The appearance of the spirant [f] in such phonological phrases gave rise to the reinterpretation of the radical segment in independent contexts, e.g. *werah → *wera → [tⁱer] *fer* – ‘man’. Almost the same goes for the emergence of word-initial tense sonorants in the ancient Irish system. The original lax sonorants underwent gemination in connected speech in *h*-prefixing contexts, which resulted in the tensing of these resonants, e.g. *ehja:h la:va: → ehja: La:va: → [ə 'La:ṽ] *a llám* – ‘her hand’. These context-dependent tense resonants were subsequently treated as radical context-independently too, e.g. *la:va: → *La:va: → [La:ṽ] *lám* – ‘hand’.

An interesting side effect of the discussion above is the observation that leniting and non-leniting environments may often produce identical results, e.g. the leniting *sinda: su:lis → [iN 'tu:lⁱ] *int súil* – ‘the eye’ and the non-leniting

*sindos ek^wos → [iNⁱ 'tⁱeχ] *int ech* – ‘the horse’, which means that the ancient mutations had not yet crystallized their grammatical functions but had much in common with pure phonology.

In the ensuing part of this chapter we will focus on lenition in original weakening contexts and subsequent pre-Old Irish adjustments in connected speech.

2.4. Leniting environments and pre-Old Irish adjustment processes

2.4.1. Leniting definite articles

Having dealt with non-leniting contexts in the prehistory of Irish, in this part of the present chapter we will come to grips with leniting environments. The aim of this discussion is to demonstrate that pre-Old Irish adjustments, which chronologically followed lenition, were more significant to the ultimate phonological shape of many close syntactic groups in Old Irish than lenition itself.

The examples presented in the introduction to leniting and non-leniting contexts in (2.2.2.) were by and large uncontroversial in that, after the word-initial weakening of consonants, no subsequent changes had major impact on the shape of phonological phrases. Consider two relevant examples which show the development of close syntactic groups in two weakening contexts: after *sindi: – the genitive singular masculine definite article, and after *sinda: – the nominative singular feminine definite article.

(49) Proto-Celtic	Lenition Stage	Old Irish
a. *sindi: ke:l i:ji:	*indi: χe:l <i>i</i> :ji:	[iN ⁱ 'χ ⁱ e:l ⁱ i] <i>in chéili</i> – ‘of the fellow’
b. *sinda: banna :	*inda: vanna:	[iN ⁱ 'v ⁱ eN] <i>in benn</i> – ‘the peak’

In (49a) the radical noun-initial [k] of ***ke:l**i:ji: – ‘companion’ undergoes lenition to [χ] at the Lenition Stage and remains unchanged later. Also in (49b) the original [b] of the noun **banna**: – ‘peak’ is subject to weakening to [v], but no further changes affect it. Later on, the whole phrases in (49a, b) experience the loss of vocalic endings (in both function words and lexical items) but these developments have no major influence on the shape of the word-beginnings in the relevant nouns.

Nevertheless, in Old Irish there were many close syntactic groups in which the changes which followed lenition had immense impact on the left-hand edge of lexical items. Since the groups to be discussed below include the definite articles shown in (49), let us first concentrate on the developments of these function words. Consider the morphological changes in the gen.sg.masc. definite article *sindi: in (50a) and the nom.sg.fem. definite article *sinda: in (50b):

(50) *Proto-Celtic**Old Irish*

- a. *sindi: → *indi → *iNdə → *iNd → [iNd/iN/iNt]
 b. *sinda: → *inda → *iNdə → *iNd → [iNd/iN/iNt]

The developments of two originally disparate definite articles show that these function words displayed identical shapes some time before Old Irish, namely from the stage of *iNdə onwards. What also seems certain is that when these articles contained vocalic endings (the first three stages), they caused lenition, while without these endings the weakening they triggered was no longer phonologically motivated. In other words, there was no longer any phonological or intervocalic context for lenition. It is not impossible to speculate that the grammaticalization of lenition took place when these articles were still vowel-final, but this cannot be proved in any way.

During the stages of phonological lenition the noun-initial weakened segments surfaced in their depleted versions, e.g. the lenited [b] was [v], the weakened [k] was [χ], etc., e.g. *sinda: **banna:** → *inda: **vanna:** → *iNda **vanna** → *iNdə **vænnə** – ‘the peak’. During all that time the articles ended in full or reduced vowels. This state of affairs lasted until the period of apocope, which was when the articles lost their final vowels, by then reduced to schwa. This took place in Primitive Irish around 500 A.D. (McCone 1996:127). So the final asterisked stage in (50) reveals the shape of these articles in the phase immediately preceding Old Irish. It should be noted that both the masculine and feminine articles still had one version, which was *iNd. The change of the nature of lenition from phonologically motivated to grammatical can be clearly observed in *iNdə **vænnə** → *iNd **venn** → [iNⁱ 'vⁱeN] *in benn* – ‘the peak’, where the intervocalic context for the lenition of [b] to [v] disappears for good but the effects of the process remain.

When we turn to Old Irish, these articles still perform their historically determined leniting functions but, interestingly, they display as many as three contextual variants: [iN], [iNd] and [iNt]. These variants depend on the nature of the first segment of the closely connected following word. Representative examples of all these variants followed by nouns beginning in different segments are provided below.

(51) *Nominative Singular Feminine* *Genitive Singular Masculine*

a.

[iN] BEFORE LENITED NON-DENTAL OBSTRUENTS

[iN 'χlaNd] <i>in chland</i> – ‘the family’	[iN 'χor ⁱ p ⁱ] <i>in choirp</i> – ‘of the body’
[iN 'γuð ⁱ e] <i>in guide</i> – ‘the prayer’	[iN 'ṽur ⁱ] <i>in múir</i> – ‘of the wall’
[iN ⁱ 'v ⁱ riathər] <i>in bríathar</i> – ‘the word’	[iN 'vaL ⁱ] <i>in baill</i> – ‘of the limb’

b.

[iNd] BEFORE VOWELS, LENITED f = [ø], AND LAX l, r, n

[iN 'daðəY ⁱ] <i>ind adaig</i> – ‘the night’	[iN 'duL ⁱ t ⁱ] <i>ind fuilt</i> – ‘of the hair’
[iN 'dru:n] <i>ind rín</i> – ‘the secret’	[iN ⁱ 'd ⁱ eχ ⁱ] <i>ind eich</i> – ‘of the horse’
[iN 'dla:~] <i>ind lám</i> – ‘the hand’	[iN ⁱ 'd ⁱ n ⁱ eR ⁱ t ⁱ] <i>ind neirt</i> – ‘of the strength’

c.

[iNt] BEFORE LENITED s = [h]

[iN 'tu:l ⁱ] <i>int suil</i> – ‘the eye’	[iN 'ta ⁱ m ⁱ] <i>int sailm</i> – ‘of the psalm’
--	---

In (51a) the definite article [iN] is followed by a lenited obstruent, e.g. [χ], or a cluster containing a lenited obstruent and a lax sonorant, for example [χl]. In (51b) the article appears in its more ancient version, which is [iNd]. This variant of the article surfaces in front of vowels, e.g. [a], or lax sonorants, for instance [r], as well as before the lenited [f], that is zero. In (51c), in turn, we can observe the replacement of the lenited [s], that is [h], by the fortis version of the final segment of the article. This resembles the so-called *t*-prefixation with which we were dealing with while discussing non-leniting contexts. A detailed derivation of the form in (51c), i.e. *sinda: su:lis → *inda: hu:lih → *iNda hu:li → *iNd hu:lⁱ → [iN 'tu:lⁱ] *int suil* – ‘the eye’, suggests that we may be facing a similar development. This example also points to the fact that, similarly to the other consonants, [s] underwent regular lenition in prehistory.

All these examples represent historical leniting contexts but the different versions of the definite articles in Old Irish suggest that after the stage of lenition much happened to the phrases in (51) and that not all these phrases underwent the same changes. In the ensuing sections we will analyze the prehistoric changes which affected the representative phrases after the period of lenition.

2.4.2. Leniting articles before lenited non-dental obstruents

In Old Irish the leniting definite articles, both the gen.sg.masc. *sindi: and the nom.sg.fem. *sinda: surface as [iN] in front of prehistorically weakened obstruents. Consider the development of the gen.sg.masc. phrase [iN 'vaLⁱ] *in baill* – ‘of the limb’, which serves as an example of a leniting context.

(52) *Lenition Stage* *Old Irish*

*sindi: **balli:** → *indi: **valli:** → *iNdi **vaLi** → *iNd **vaLⁱ** → [iN 'vaLⁱ]

In this phrase the original [b] of ***balli:** – ‘limb’ undergoes weakening at Lenition Stage. In terms of elements, this change can be represented as (U, ?) → (U). Later on, nothing happens to this word-beginning. The article experiences a gradual loss of the ending, i.e. *iNdi → *iNd → [iN]. Thus, in the phase which immediately preceded Old Irish, the shape of the article was *iNd. After this stage the deletion of the article-final [d] took place. Interestingly, a similar change occurred in the nom.sg. (non-leniting) of the same noun, i.e. [iN 'baL] *in ball* – ‘the limb’, which was presented in (30) and is repeated below for convenience.

(53)

*iNdah **baLah** → *iNda **baLa** → *iNd **baL** → [iN 'baL]

In the phase immediately preceding Old Irish the definite article was also *iNd, although the context was historically non-leniting. So as to account for the deletion of [d] in the nominative [iN 'baL] *in ball* – ‘the limb’, we proposed in (31) that the article-final stop became a floating segment, i.e. one which was not associated with a skeletal position. This segment was later dropped because there was no available onset position for it to dock onto. Given that the developments in (52) and (53) are alike in that the shapes of both the nominative and genitive articles were identical, we can propose that the final [d] in the gen.sg.masc. definite article in the phrase *iNd **vaLⁱ** – ‘of the limb’ also became a floating sound. The change of *iNd **vaLⁱ** → [iN 'vaLⁱ] is graphically represented below.

(54) *Pre-Old Irish Stage* *Old Irish*

			O ₁	N ₁	O ₂	N ₂				O ₁	N ₁	O ₂	N ₂
x	x		x	x	x	x	→	x	x	x	x	x	x
i	N	d	v	a	L			i	N	v	a	L	

At the Pre-Old Irish Stage above the article-final stop [d] becomes a floating segment, i.e. a segment without a skeletal position. Because the noun-initial onset (O_1) is already occupied by the fricative [v], there is no available onset for [d] to dock onto. As a result, [d] is removed from the representation in Old Irish.

This derivation, identical to that in (31), shows that in the period which immediately preceded Old Irish, there was no difference in the treatment of ancient leniting and non-leniting contexts. All the developments were purely phonological and the fact that in *iNd vaLⁱ – ‘of the limb’ the article-final [d] preceded a previously weakened segment, while in the phrase *iNd baL – ‘the limb’ the noun-initial obstruent was radical, had no impact on the synchronic changes: [d] was dropped in the same way in both contexts.

2.4.3. Vowel-initial words after leniting articles

In vowel-initial items no weakening ever took place in the lenition stage because vowels cannot be lenited, but the subsequent development of the leniting definite article is extremely interesting. In this context the definite article (both gen.sg. masc. and nom.sg.fem.) surfaces as [iNd]. Consider the phrase [iNⁱ dⁱeχⁱ] *ind eich* – ‘of the horse’, in which the historically leniting gen.sg.masc. definite article precedes a vowel-initial noun.

(55)

*sindi: ek^wi: → *indi eχ^wi → *iNd eχⁱ → [iNⁱ dⁱeχⁱ]

This development shows that in the phase immediately preceding Old Irish the shape of the article was *iNd, similarly to consonant-initial items, e.g. *iNd vaLⁱ → [iN ‘vaLⁱ] *in baill* – ‘of the limb’. In (55), however, the article survived into Old Irish without truncation. Employing the structure of the article proposed in (54) and the idea that the article-final [d] became a floating segment just before Old Irish, we can now graphically represent the development of *iNd eχⁱ → [iNⁱ dⁱeχⁱ] *ind eich* – ‘of the horse’.

(56) *Pre-Old Irish Stage*

Old Irish

		O ₁	N ₁	O ₂	N ₂		
x	x	x	x	x	x	x	x
i	N d	e	χ ⁱ	i	N	d	e χ ⁱ

In Pre-Old Irish the article-final stop [d] becomes a floating segment. Because the noun-initial onset (O_1) is not occupied by a consonantal segment, the floating [d] can dock onto it. As a result, [d] survives in the phrase into Old Irish.

At this point it seems appropriate to recall the development of the nom.sg. of the phrase in (55), i.e. [iNⁱ 'tⁱeχ] *int ech* – ‘the horse’. Consider the historical development of this expression repeated below for convenience.

(57) *h-Prefixation* *Old Irish*
**iNdah eχ^wah* → **iNda heχ^wa* → **iNd heχ* → [iNⁱ 'tⁱeχ]

In this chain of events we are dealing with *h*-prefixation which subsequently led to *t*-prefixation. In the stage which immediately prefaced Old Irish the nom.sg. article surfaced as **iNd*, similarly to that in **iNd eχⁱ* → [iNⁱ 'deχⁱ] *ind eich* – ‘of the horse’-gen.sg. However, given that the fricative [h] had previously been lexicalized as a word-beginning in the nom.sg., the article-final [d] merged with [h] to produce [t], as proposed in (32). In the gen.sg., where no prior *h*-prefixation was present, the article simply occupied the empty onset slot, as shown in (56).

These two developments confirm the view that, just before Old Irish, the distinction into historical leniting and non-leniting environments was unimportant to the phonology: the mutations had been lexicalized and the phonology utilized the segments locally available, i.e. [d+h] = [t] in **iNd heχ* → [iNⁱ 'tⁱeχ] *int ech* – ‘the horse’-nom.sg., while [d+∅] = [d] in **iNd eχⁱ* → [iNⁱ 'dⁱeχⁱ] *ind eich* – ‘of the horse’-gen.sg.

2.4.4. Leniting articles in front of lax sonorants

The definite article (both gen.sg.masc. and nom.sg.fem.) surfaces as [iNd] in front of lax sonorants in Old Irish, e.g. [iN 'dru:n] *ind rún* – ‘the mystery’. Such a shape of the leniting article in this context is peculiar given that [iNd] occurs only before vowel-initial words, e.g. [iNⁱ 'dⁱeχⁱ] *ind eich* – ‘of the horse’-gen.sg., while consonants are invariably preceded by the form [iN], e.g. [iN 'vaLⁱ] *in baill* – ‘of the limb’-gen.sg., as presented in (51). Consider the development of the article in front of the lax [l] in the phrase [iN 'dla:ĩ] *ind lám* – ‘the hand’.

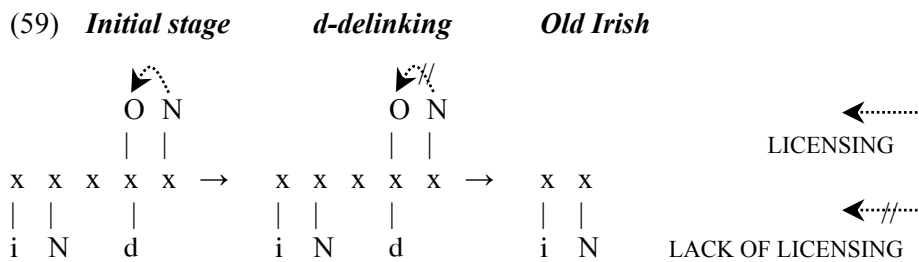
(58)
**sinda: la:ma:* → **inda: la:ĩva:* → **iNda la:ĩva* → **iNd la:ĩ* → [iN 'dla:ĩ]

We remember from (2.3.6.) that the original lax resonants were never lenited in weakening contexts, but they simply retained their original lax character. Thus, here we are interested in what happened in the stage just before Old Irish, i.e.

*iNd 1a:ĩ, that prevented the dropping of the article-final [d] and why the expected version *[iN 1a:ĩ] did not surface in Old Irish.

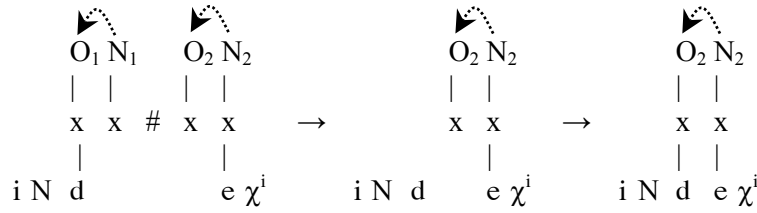
So far we have been able to explain the pre-Old-Irish adjustments without the need to resort to the theoretical notions of government and licensing. In order to account for the occurrence of [iNd] before the lax resonants, however, we need to take these concepts into consideration.

As shown in the Chapter One, in GP every onset must be licensed by the following nucleus. So must be every consonant cluster. In the prehistory of Irish, i.e. after the stage of *iNd, the article-final [d] was no longer licensed by its nucleus. As a result, this segment was apparently lost in isolation (this is implied by Quin (1975:20), who states that the general form is [iN], although it is unlikely to come across any article in isolation). Consider the structural development of the definite article (both nom.sg.fem. and gen.sg.masc.) between the stage of *iNd and the Old Irish [iN], where the licensing of the article-final segment [d] is shown. For the sake of simplicity, the other segments of this article are left unsyllabified.



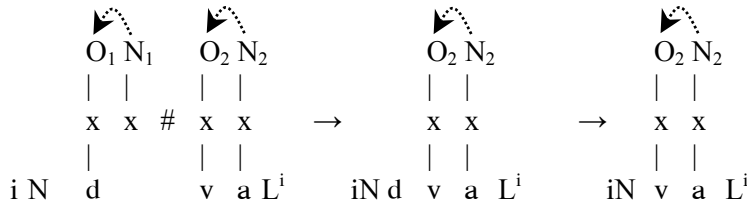
In the Initial Stage, that is *iNd, the onset dominating the segment [d] is licensed by the following nucleus. In the *d*-delinking Stage the nucleus no longer provides licensing to the preceding onset, as a result of which [d] is delinked. Thus, the Old Irish version is [iN]. The deletion of the final [d] occurred also in lexical items. More details are provided in Chapter Three.

Now let us reconsider the simplified development of this article in front of vowel-initial lexical items and before words beginning in consonants. The changes in words with vocalic beginnings are represented by the form *iNd eχⁱ → [iNⁱ d'eχⁱ] *ind eich* – ‘of the horse’-gen.sg. The licensing of relevant positions is indicated by the arrows.

(60) *Initial stage* *d-delinking* *d-licensing (Old Irish)*

This development shows that in the Initial Stage the article-final [d] under (O₁) is licensed by the following nucleus (N₁). The noun-initial vowel [e] under (N₂) licenses the preceding onset (O₂). At the *d*-delinking Stage the segment [d] is no longer associated with a skeletal position. The positions (O₁) and (N₁), both being empty, are removed from the representation. In the *d*-licensing Stage [d] docks onto the onset (O₂) which is licensed by the following nucleus (N₂). The resulting contextual form of the article is [iNd] and the whole phrase surfaces as [iNⁱ 'dⁱeχⁱ] *ind eich* – ‘of the horse’-gen.sg.

Now let us turn to the consonant-initial words and the changes in the definite article. Consider the development of the phrase *iNd vaLⁱ → [iN 'vaLⁱ] *in baill* – ‘of the limb’-gen.sg. in which the licensing of the relevant positions is shown.

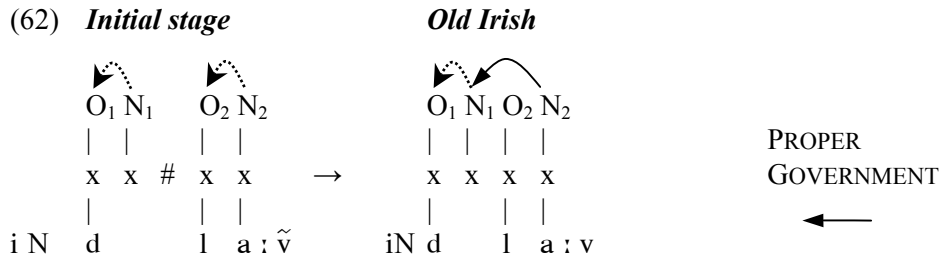
(61) *Initial stage* *d-delinking* *Old Irish*

In the Initial Stage the nucleus (N₁) licenses the preceding article-final [d] under (O₁). The nucleus (N₂) licenses the onset (O₂), which dominates the fricative [v]. At the *d*-delinking Stage the segment [d] is no longer linked to a skeletal slot. Given that (O₂) is occupied by the noun-initial [v], there is no available onset for [d] to dock onto. Accordingly, the Final Stage displays no [d] in the phrase [iN 'vaLⁱ] *in baill* – ‘of the limb’-gen.sg.

Given these developments, we are now in a position to try to account for the surprising preservation of the article-final [d] in phrases including words which begin in lax resonants, e.g. *iNd la:~ṽ → [iN 'dla:~ṽ] *ind lám* – ‘the hand’. The article-final [d] in such phrases behaves like the same segment in phrases with vowel-initial items, e.g. *iNd eχⁱ → [iNⁱ 'dⁱeχⁱ] *ind eich* – ‘of the horse’-gen.sg.

in (60), although its development should be comparable to that in expressions with consonant-initial lexical words, e.g. *iNd vaLⁱ → [iN 'vaLⁱ] in *baill* – ‘of the limb’-gen.sg. in (61). Briefly, the article-final [d] seems to be licensed by the word-beginning in phrases with resonant-initial words but not in obstruent-initial items.

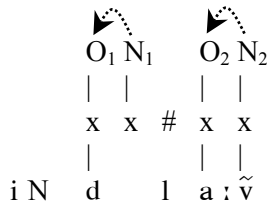
There are two theoretical possibilities of explaining why this [d] was not dropped. One is that the article was incorporated into the phonological phrase, i.e. *iNd+la:~ṽ → *iNdla:~ṽ – ‘the hand’, and the nucleus licensing of the previously article-final [d] was made stronger by becoming word-medial. This is represented below.



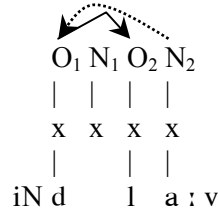
In the Initial Stage the article and the noun constitute two separate domains. The article-final [d] under (O₁) is licensed by the domain-final empty nucleus (N₁). The noun-initial onset (O₂) is naturally licensed by the following nucleus (N₂). When the morphological boundaries have been removed in Old Irish, the nucleus (N₂) properly governs the preceding one (N₁). This nuclear slot, in turn, is no longer domain-final and its licensing potential has been somehow enhanced. Given additional support, (N₁) can license the segment [d] under (O₁). Thanks to this licensing, [d] remains in the phrase [iN 'dla:~ṽ] *ind lám* – ‘the hand’.

This analysis has at least one disadvantage, however. In particular, there is no structural way of explaining why an analogical development did not take place in the case of *iNd vaLⁱ → [iN 'vaLⁱ] in *baill* – ‘of the limb’-gen.sg. in (61). Theoretically, Proper Government could apply there as well because the initial structures in (61) and (62) are identical. Thus the only reason why the cluster [dl] is possible in [iN 'dla:~ṽ] *ind lám* – ‘the hand’ while, say, [dv] is not permissible in the non-existent *[iN 'dvaLⁱ] in *baill* – ‘of the limb’, is the phonotactic restrictions of the phonological system.

The other way of explaining why the article-final [d] is preserved is that this segment can contract a governing relation with the following resonant but not with another obstruent. This is represented below.

(63) *Initial stage*

→

Old Irish

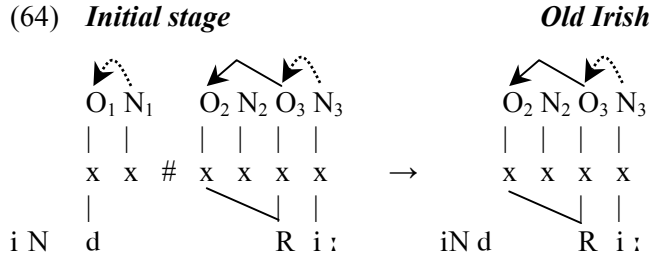
In the Initial Stage the article-final nucleus (N_1) licenses the preceding onset dominating [d] while the sonorant [l] attached to (O_2) is obviously licensed by (N_2). When the morphological boundaries no longer separate the article from the noun, a rightward governing relation is established between the governor [d] and the governee [l]. This relation is licensed by (N_2). Such a relation would be comparable to that obtaining in words which lexically begin with clusters like [dl], e.g. [iN 'dlus] *in dlús* – ‘the density’.

However neat this proposal might appear, in Chapter Three it is argued that a rightward interonset relation, i.e. one in which the governor precedes the governee, is absent from the phonological system of Old Irish because all such relations were broken up in Proto-Celtic. It is theoretically possible to claim that rightward interonset relations were re-established in some cases just before Old Irish but there is no way to prove such a claim at this stage of research. Thus, both the solutions proposed in (62) and (63) leave something to be desired. What appears to get the upper hand is the phonotactics and not the structure.

At this point we should also return to the question of why the tense sonorants can only be preceded by the definite article in the shape of [iN], e.g. *sindos ri:s → *indah ri:h → *iNda Ri: → *iNd Ri: → [iN 'Ri:] *in rí* – ‘the king’. Of course tense sonorants occur only in non-leniting contexts, but we saw in (2.4.3.) that the historical mutating and non-mutating contexts were treated uniformly by the phonology just before Old Irish, e.g. [d+h] = [t] in *iNd heχ → [iNⁱ tⁱeχ] *int ech* – ‘the horse’, whereas [d+∅] = [d] in *iNd eχⁱ → [iNⁱ dⁱeχⁱ] *ind eich* – ‘of the horse’-gen.sg.

In (2.3.6.) it was argued that the tense sonorants originate from the gemination of the original lax ones at the expense of the final -h, e.g. *iNdah ri:h → *iNda Ri: – ‘the king’. Just before Old Irish the version of this phrase must have been *iNd Ri:, which did not develop into *[iN 'dRi:] but into [iN 'Ri:]. Hence the article-final stop [d] was dropped, unlike before lax resonants, e.g. *iNd ri:γ → [iN 'dri:γ] *in rīg* – ‘of the king’-gen.sg. Also here two analyses can be offered.

One is based on phonotactics. In particular, sequences such as [dR] occur nowhere in the system and this is why the article-final [d] was dropped in *iNd Ri: → [iN 'Ri:] *in rí* – ‘the king’. The other is that, since the tense sonorants were geminates, they were interonset governing domains. Thus, there was no way of contracting a governing relation, as that in (63), between [d] and the geminate [R] because the latter already participated in one relation. This is shown below:



The Initial Stage in (64) shows that the article-final [d] under (O₁) is licensed by its nucleus (N₁). The interonset relation (O₃O₂), which contains the geminate [R] is government-licensed by the vowel under (N₃). In Old Irish the onset-nucleus sequence (O₁N₁) is removed from the representation. The segment [d] cannot dock onto (O₂), which is governed by (O₃), nor can it preserve its own position (O₁) because (N₃) cannot act as a proper governor over a governing domain. Consequently, [d] is unlicensed and the phrase surfaces as [iN 'Ri:] *in rí*.

All things considered, it seems that the preservation of the article-final [d] before initial lax resonants in the following words, e.g. *iNd ri:y → [iN 'dri:y] *in rí* – ‘of the king’-gen.sg., had much to do with the phonotactics, i.e. clusters like [dr] were frequent within words, e.g. [drumⁱ] *druimm* – ‘back’. As a result, the previously article-final [d] was licensed as a word beginning. Whether there was a governing relation between this stop and the following resonant, as proposed in (63), or not, as suggested in (62), cannot be stated at this stage.

In the ensuing section we will deal with the fricative [s] following the leniting definite articles. Interestingly, the phenomena to be shown below are already familiar from non-leniting contexts.

2.4.5. Articles before lenited [s] and *t*-prefixation

The leniting definite article (both nom.sg.fem. and gen.sg.masc.) is realized as [iNt] in close syntactic phrases before the historically lenited [s], that is [h]. In fact, neither [s] nor its lenited variant ever surface in this context in Old Irish and we may speak about replacing this fricative by [t], e.g. [iN 'tu:lⁱ] *int suil* – ‘the eye’-nom.sg.fem. Thus, this looks like another instance of the so-called *t*-

prefixation, whose occurrence in non-leniting and *h*-prefixing contexts we discussed at length in (2.3.3.), e.g. [iNⁱ 't'eχ] *int ech* – ‘the horse’-nom.sg.masc.

While describing *t*-prefixation in *h*-prefixing environments (i.e. to vowel-initial words), we argued that after the lenition of the definite article-final [s] to [h], e.g. *sindos → *inda**h**, there occurred the lexicalization of this [h] as a word-beginning in words with initial vowels. Later on, after final-vowel deletion, the article-final [d] and the noun-initial [h] stood side by side, which ultimately resulted in their merger to [t]. This development is recapitulated below, the phrase [iNⁱ 't'eχ] *int ech* – ‘the horse’-nom.sg.masc. serving as an example:

(65)

*sindos ek^wos → (lenition s→h) *inda**h** eχ^wah → (*h*-prefixation) *iNda **h**eχ^wa → (vowel deletion) *iN**d** **h**eχ → (merger d+h = t) [iNⁱ 't'eχ] *int ech* – ‘the horse’

This is how *t*-prefixation worked in *h*-prefixing contexts. Now let us turn to leniting environments, where the article never ended with [s], as it was either *sinda: (nom.sg.fem.) or *sindi: (gen.sg.masc.), but the noun began with this fricative. Consider the development of the phrase [iN 'tu:lⁱ] *int súil* – ‘the eye’ below:

(65)

*sinda: **s**u:lis → (lenition s→h) *inda: **h**u:lih → (vowel shortening) *iNda **h**u:li → (vowel deletion) *iN**d** **h**u:lⁱ → (merger d+h = t) [iN 'tu:lⁱ] *int súil* – ‘the eye’

(65) shows that the initial [s] of ***s**u:lis – ‘eye’ was first lenited to [h] after the vowel of the preceding article *sinda:. The subsequent vowel deletion in the article, i.e. *iNda → *iNd, resulted in the immediate neighbourhood of the segment [d], which was article-final at that stage, and [h], which was noun-initial. This closeness led to the merger of these two sounds into one [t]. Consequently, the pre-Old Irish *iN**d** **h**u:lⁱ surfaced as [iN 'tu:lⁱ] *int súil* – ‘the eye’ in Old Irish.

Minor details apart, the developments shown in (64) and (65) are almost identical in that after the lenition of [s] to [h], which took place irrespective of the position of this fricative (final in *sindos in (64) but initial in ***s**u:lis in (65)), and vowel deletion, the segments [d] and [h] were brought together just before Old Irish, which resulted in the appearance of [t].

t-prefixation is another phenomenon which occurs in both weakening and non-leniting historical environments. This confirms the view that the pre-Old Irish adjustments were made irrespective of prior mutations and that phonology was performed on the material synchronically available.

So far in our analysis of pre-Old Irish adjustments in weakening contexts we have been dealing with historically leniting articles which precede weakened

non-dental obstruents (2.4.2.), vowel-initial words (2.4.3.), lax resonants (2.4.4.) and the lenited fricative [s] (this section). Readers will have noticed the conspicuous absence of dental stops and their lenited counterparts in the collection of cases in (51) above and in the present discussion. There is a good reason why they have not been analyzed yet. In the following section we will inspect the behaviour of the leniting articles in front of [t] and [d].

2.4.6. Leniting articles in homorganic contexts

Unlike the other consonants, the dental stops [t] and [d] do not undergo weakening when they follow the regularly leniting definite article in Old Irish. They appear in their radical versions. Consider the cases below containing phrases with leniting articles (nom.sg.fem. and (gen.sg.masc.) followed by lexical words which begin in [t] and [d].

(66) <i>Nominative Singular Feminine</i>	<i>Genitive Singular Masculine</i>
[iN 'tuaθ] <i>in túath</i> – ‘the tribe’	[iN 'tur ⁱ k ⁱ] <i>in tuirc</i> – ‘of the boar’
[iN 'daɣ ⁱ] <i>in daig</i> – ‘the fire’	[iN 'da [~] v ⁱ] <i>in daim</i> – ‘of the ox’

The influence of the normally leniting articles in these cases considerably differs from what we observed in (2.4.2.), e.g. *iNd vaLⁱ → [iN 'vaLⁱ] *in baill* – ‘of the limb’-gen.sg. The dental stops, unlike all the other true consonants, are never lenited into the corresponding fricatives. On the face of it, it is slightly surprising that such incongruities occur in the system. However, if we decide to go back in time and investigate the reasons behind the state of affairs present in Old Irish, these phenomena are no longer so unexpected.

The definite articles in question, that is those which constituted a historical leniting context, had always displayed the final vowel, e.g. *sinda: → *iNda → *iNdə (nom.sg.fem.) until the period of apocope (final-vowel loss) when they became *iNd. According to McCone (1996:127) that process occurred immediately before Early Old Irish. Thus, there was no reason why dentals should have remained unaffected by weakening at the stage of phonological mutation.

Suffice it to say that [t] and [d] were lenited on a regular basis after a vowel, e.g. *esjo to:ta: → *ehja θo:θa: → [ə 'θuaθ] *a túath* – ‘his tribe’, which results from the fact that the masculine pronoun had a final vowel at the time of purely phonological lenition. It must be admitted, then, that words containing original initial dental stops entered the period of Primitive Irish and, possibly, Early Old Irish with initial dental fricatives after the leniting definite articles too. Thus, *iNda θo:θa – ‘the tribe’ and *iNda ðæɣ^wih – ‘the fire’ seem to be expected predecessors of [iN 'tuaθ] and [iN 'daɣⁱ] respectively (see also McCone 1996:

111, 134). After the vocalic ending of the article had been dropped, that is $*iNdə \rightarrow *iNd$, the two homorganic sounds, that is [d] of the article and [ð] or [θ] of the noun, were brought together. We saw earlier that when certain sounds come together, they may interact, e.g. [h+w] = [f] in $*iNdah\ werah \rightarrow *iNdə\ fera$ – ‘the man’ and [d+h] = [t] in $*iNd\ heχ \rightarrow [iN^i\ t^i eχ]$ *int ech* – ‘the horse’.

Thurneysen (1946:86) states that under such circumstances, i.e. in immediate vicinity, homorganic lenited segments may have combined “to give the corresponding unlenited geminate”. This amounts to saying that under the influence of a homorganic segment the dental fricatives were delenited and turned back into stops. This would not have been an unusual operation. A similar phenomenon was also observed in the case of word-medial homorganic sequences where dental, labial or velar fricatives, when brought together, were strengthened to stops. Consider for example $*nevə\ vūithə \rightarrow *nev\ vūith \rightarrow [N^i ebəð^i]$ *nepuid* – ‘non-being’ and $*teγə\ γnaθəðe \rightarrow *teγ\ γnaθðe \rightarrow [t^i egnat^i e]$ *tecnate* – ‘domesticus’, where homorganic clusters such as [vγ], [γγ] and [θð] which were later strengthened to [b], [g] and [t] respectively, resulted from syncope (a process of word-medial vowel deletion which took place after apocope and just before Early Old Irish). Taking these remarks into account, we may propose the following development of phrases in which dental-initial words follow leniting articles:

(67)	‘the tribe’		‘the fire’
a.	$*sinda: to:ta:$	BEFORE MUTATIONS	$*sinda: deg^w is$
b.	$*inda\ θo:θa$	LENITION	$*inda\ δæγ^w ih$
c.	$*iNdə\ θo:θə$	VOWEL REDUCTION	$*iNdə\ δæγ^i$
d.	$*iNd\ θo:θ$	APOCOPE	$*iNd\ δaγ^i$
e.	$*iNd\ to:θ$	DELENITION	$*iNd\ daγ^i$
	[iN ‘tuaθ]	OLD IRISH	[iN ‘daγ ⁱ] ²⁷

In (67b) we see the regular intervocalic lenition of both original dental stops, that is [t] \rightarrow [θ] and [d] \rightarrow [ð]. In (67d) the two dentals originally belonging to different morphological objects, the article and the noun, stand side by side, i.e. [dθ] and [dð], since apocope has eliminated the intervening vowels. Thurneysen (1946:86ff.) postulates that just before Old Irish (67e) delenition occurs owing to this vicinity, the result being [dt] and [dd]. The fact that in the former case the ultimate result was [t] and not [d] indicates that the original voiceless segment was restored. He also states that although these unlenited segments were originally geminates, they were in the process of being simplified within Old Irish. Consequently, the Old Irish reflexes displayed single dental stops noun-initially.

²⁷ The breaking of [o:] into [ua] in Early Old Irish is disregarded for the sake of clarity.

The syllabic status of [t] in [iN 'tuaθ] and [d] in [iN 'daɣⁱ] in Old Irish is not only uncertain but also unimportant. We can only see the input [dθ] and [dð] as well as the output [t] and [d]. What we know about the historical developments of similar forms indicates that all the necessary conditions for dental spirants to become stops were met. So, what matters here is the result and the environment.

2.4.7. Leniting and non-leniting contexts – summary

Above the developments of close syntactic groups in both weakening and non-leniting contexts from Proto-Celtic to Old Irish have been analyzed. It has been demonstrated that the age of phonological lenition, which turned stops into fricatives and [s] into [h], was only a stage in the whole chain of events that led to the form of the language known as Old Irish. Processes such as *h*-prefixation, the origin of [f] and tense sonorants and the merger of [h+d] → [t] were equally important in the formation of Irish. In many cases these were the only ones that mattered. We have also seen that at every stage the phonology of the language made use of the contexts currently present, e.g. the original distinction into leniting and non-leniting contexts was insignificant to the phonology just before Old Irish. The relevant developments are summarized below (^L = leniting context):

(68)

PROTO-CELTIC	<i>lenition</i>	<i>h-prefixation</i>	<i>apocope</i>	OLD IRISH
		<i>h-deletion</i>		<i>d-prefixation</i>
		<i>vowel shortening</i>		<i>d-deletion</i>
		<i>mergers</i> h+w = f h+r = R		<i>merger</i> d+h = t <i>delenition of dentals</i>
*sindi: ek ^w i:	*indi: eχ ^w i:	*iNdi eχi	*iNd eχ ⁱ	[iN ⁱ 'd ⁱ eχ ⁱ] ^L
*sindos ek ^w os	*indah eχ ^w ah	*iNdə heχə	*iNd heχ	[iN ⁱ 't ⁱ eχ] ^L
*sinda: su:lis	*inda: hu:lih	*iNdə hu:li	*iNd hu:li	[iN 'tu:l ⁱ] ^L
*sindos wiros	*indah werah	*iNdə ferə	*iNd fer	[iN ⁱ 't ⁱ er] ^L
*sindos ri:s	*indah ri:h	*iNdə Ri:	*iNd Ri:	[iN 'Ri:]
*sindi: ri:gos	*indi: ri:yah	*iNdi ri:ɣə	*iNd ri:ɣ	[iN 'dri:ɣ] ^L
*sindos ballos	*indah baLah	*iNdə baLə	*iNd baL	[iN 'baL] ^L
*sindi: balli:	*indi: valli:	*iNdi vaLi	*iNd vaL ⁱ	[iN 'vaL ⁱ] ^L
*sindos tegos	*indah teyah	*iNdə teɣə	*iNd teɣ	[iN ⁱ 't ⁱ eɣ] ^L
*sinda: to:ta:	*inda: θo:θa:	*iNdə θo:θə	*iNd θo:θ	[iN 'tuaθ] ^L

The ensuing sections deal with the other word-initial mutation important to the development of Irish, namely nasalization.

2.5. The history of nasalizing contexts

2.5.1. Introduction

Similarly to lenition, word-initial nasalization was a purely phonological process in the prehistory of Irish. Specifically, words ending in a nasal influenced the initial consonants of the following lexical items some time between Primitive Irish and Early Old Irish (McCone 1996:108). Eclipsis affected a number of consonants, so it must be viewed as the second (after lenition) significant archaic mutation whose impact on the subsequent development of the Irish language was immense. Let us recall that in Old Irish, due to eclipsis, the radical fortis stops become lenis, e.g. [kol]/[ə'gol] *col/ a col* – ‘sin’/‘their sin’, while the radical lenis stops turn into the corresponding tense nasals, e.g. [du:n]/[ə'Nu:n] *dún/ a ndún* – ‘fort’/‘their fort’. The spirant [f] surfaces as [v] in a nasalizing context, whereas the sibilant [s] is frequently doubled in the spelling, which indicates the lack of lenition. Moreover, sonorants are said to be unaffected by this mutation.

2.5.2. Historical causes of nasalization

Although eclipsis had important grammatical functions to perform in Old Irish, similarly to those in Modern Irish, such alternations reflected the historical process of nasalization which was entirely phonological. Consider the following cases showing the development of archaic forms which ultimately led to Old Irish (McCone 1996). Stage I shows the situation from before the nasalization, while at Stage II the word-initial segments have undergone eclipsis.

(69) <i>Stage I</i>	<i>Stage II</i>	<i>Old Irish</i>
*sindoihan karantan	→ *indoja gareda	→ [iNə 'garəd] <i>inna carat</i> – ‘of the friends’-gen.pl.
*ejan teyah	→ *eja deya	→ [ə 'dʲeɣ] <i>a teg</i> – ‘their house’
*ejan dæɣ ^w ih	→ *eja ndæɣ ^w i	→ [ə 'Naɣ ⁱ] <i>a ndaig</i> – ‘their fire’
*ejan bæнна:	→ *eja mbenna	→ [ə 'mʲeN] <i>a mbenn</i> – ‘their peak’
*sindan eχ ^w an began	→ *inda neχ ^w a mbega	→ [iN ⁱ 'Nʲeχ 'mʲeg] <i>in n-ech mbecc</i> – ‘the small horse’-acc.sg.
*sindoihan Ri:yan	→ *indoja Ri:ya	→ [iNə 'Ri:ɣa] <i>inna ríga</i> – ‘of the kings’ gen.pl.

The example of *sindoihan **karantan** → *iNdoja **gareda** – ‘of the friends’-gen. pl. shows that in Stage II the original voiceless [k] becomes [g], which is accompanied by the loss of the nasal previously terminating the article. It is noteworthy that the word-medial sequence [nt] underwent a parallel change yielding [d]. The case of *ejan **teyah** → *eja **deya** – ‘their house’ illustrates the change of the original [t] to [d] due to nasalization in Stage II. Moreover, the article-final nasal disappears. In *ejan **dæy^wih** → *eja **ndæy^wi** – ‘their fire’ and *ejan **bænna:** → *eja **mbenna** – ‘their peak’ we see that the original voiced stops [d] and [b] first cause the assimilation of the preceding nasals as regards the place of articulation (**nd* and **mb*, respectively, in Stage II). In Old Irish it is the tense nasals that replace the homorganic voiced oral stops. Also in the penultimate case we can observe the so-called *n*-prefixation to the word [eχ], which originally displayed the initial vowel [e]. Finally, in *sindoihan Ri:yan → *iNdoja Ri:ya – ‘of the kings’-gen.pl. we see that the prehistoric liquid [R] is immune to eclipsis since apparently nothing happens to it at any stage. This view will soon be challenged.

Although it is not uncommon to encounter views that eclipsis is confined to word boundaries, in prehistory its activity was also observed in the interior of words. However, it must be admitted that word-internal nasalization was anything but spectacular. Readers will have noticed the word-internal change of [nt] into [d] in *karantan → *gareda. This change is comparable to that in *ejan teyah → *eja deya. The only difference between these two developments is the presence of a morphological boundary in the latter case. We know, however, that boundaries do not play any significant roles in mutations, as shown earlier in this chapter. Thus, we may ignore them. Now consider another few examples of historical forms affected by internal nasalization based on McCone (1996:107):

(70) Stage I	Stage II	Stage III	Old Irish	
*kæntan	*kændan	*kæ:dan	[k ¹ ɛ:d]	<i>cét</i> – ‘hundred’
*winta	*winda	*weda	[f ¹ ɛd]	<i>fet</i> – ‘whistle’
*tonketah	*tongetah	*togeθa	[togəð]	<i>tocad</i> – ‘fortune’

As shown in (70), nasalization primarily affected only two consonant clusters, namely the coronal [nt] and the velar [ŋk] which, after the transitional Stage II, gave rise to [d] and [g], respectively, with or without the concomitant compensatory lengthening of the preceding vowel. The development of these clusters into single segments accounts for the absence of word-medial [nt] and [ŋk] in Old Irish.²⁸ As regards the labial cluster [mp], it did not follow suit because there

²⁸ The cluster *-nt-* seems to occur in syncopated forms only, e.g. *oinoθu:θ → *oíntu* – ‘unity’.

was no such combination in either Insular Celtic or Primitive Irish. The main reason for its absence is the systemic lack of [p] in Insular Celtic and early Primitive Irish. This segment was borrowed from Latin much later. In fact, the cluster [mp] had just started to appear with either loanwords, e.g. [tⁱempul] *tempul* – ‘temple’, or as a development of the labial nasal followed by [b] and [h], e.g. *imbu-how → *imb^hoy → [impi] : *impai* – ‘turns’ (dependent verbal form). Interestingly, this merger of [b]+[h] producing the Old Irish [p] is another argument in favour of the view that fortis consonants contain all the primes of their voiced counterparts plus the tone (H) which is realized as [h] in isolation.

These examples, particularly Stages I and II, also indicate that, between the major Stages I and II in (69), there must have been at least one phase when the article-final nasal assimilated as regards the place of articulation to the following fortis consonant, e.g. *sindoihan karantan → *indoiha^ŋ karantan → *indoiha^ŋ garandan → *iNdoja gareda – ‘of the friends’.

Therefore, the process of nasalization began in Insular Celtic with the simplification of two word-medial clusters only and subsequently developed into a sizeable morphophonological activity (Kortlandt 1982:78). The reason why nasalization started to play a role in altering the shape of word-initial segments can be sought in the fact that at some point morphological boundaries ceased to matter for phonology. Let us recall that word-initial lenition of obstruents took place when the medial intervocalic context V_V, e.g. *kladibos → *klaðivah → [klaðⁱəv] *claideb* – ‘sword’, became indistinguishable from V#_V, e.g. *indi:balli: → *iNdi: valli: → [iNⁱ ‘vaLⁱ] – ‘of the limb’. We have also seen that segments previously belonging to two different morphemes could merge to form one expression, e.g. *iNdah werah → *iNda fera → [iNⁱ tⁱer] – ‘the man’. The origin of [f] from [h+w] in this phrase resembles the merger of [n+t] into [d] in, say, *ejan teyah → *eja deya → [ə dⁱey] *a teg* – ‘their house’. There are also other similarities between *h*-prefixing and nasalizing contexts. For example, *h*-prefixation in *ehja:h eχ^wah → *eja: heχ^wa → [ə ‘heχ] *a ech* – ‘her horse’ is parallel to *n*-prefixation in *indan eχ^wan → *iNda neχ^wa → [iNⁱ ‘Nⁱeχ] *in n-ech* – ‘the horse’-acc.sg. This similarity may not be accidental because the final *-h* and *-n*, which terminated words in Primitive Irish were dropped in more or less the same period (McCone 1996:120ff.). As a result of their loss, all the mutations became totally grammaticalized. Consider the following exemplary phrases in which we can see the developments of three possible phonological contexts: leniting in (71a), non-mutating (*h*-prefixing) in (71b), and nasalizing (*n*-prefixing) in (71c). Prefixations take place only if the lexical items begin in a vowel.

(71)	<i>Stage I</i>	<i>Stage II</i>	<i>Stage III</i>	<i>Old Irish</i>
a.	*esjo tegos *esjo ek ^w os	*eja θeyah *eja eχ ^w ah	*eja θeyā *eja eχ ^w ā	[ə 'θ ⁱ ey] <i>a teg</i> – ‘his house’ [ə 'eχ] <i>a ech</i> – ‘his horse’
b.	*esja:s tegos *esja:s ek ^w os	*eja:h teyah *eja:h eχ ^w ah	*eja: teyā *eja: heχ ^w ā	[ə 't ⁱ ey] <i>a teg</i> – ‘her house’ [ə 'heχ] <i>a ech</i> – ‘her horse’
c.	*esjo:m tegos *esjo:m ek ^w os	*ejan teyah *ejan eχ ^w ah	*eja deya *eja neχ ^w ā	[ə 'd ⁱ ey] <i>a teg</i> – ‘their house’ [ə 'N ⁱ eχ] <i>a n-ech</i> – ‘their horse’

Stage I shows the Proto-Celtic situation. At Stage II in (71a) lenition takes place in the case of the a consonant-initial item, i.e. *tegos → *θeyah, but nothing happens to the initial vowel in the word *ek^wos because there is no preceding consonant to be prefixed to the word-beginning. Finally, Stage III reveals that in both (71b) and (71c) the previously pronoun-final [h] and [n], respectively, have been shifted to the beginning of the following vowel-initial word, i.e. *eja:h eχ^wah → *eja: heχ^wā and *ejan eχ^wah → *eja neχ^wā. Moreover, the pronoun-final [h] has disappeared before the consonant-initial word, i.e. *eja:h teyah → *eja: teyā, while the previously final [n] has led to the voicing of the initial consonant in *ejan teyah → *eja deya.

The reason why these two segments, that is [h] and [n], were prone to deletion in word-final position may be that they were both the simplest expressions possible. To put it differently, it may be postulated that they contained only one element. So far we have been assuming that [h] consists of the high tone element (H) only. It is not impossible to assume that [n] includes also only one prime. Despite the fact that in Old Irish [n] was a dental nasal, there is no evidence to assume that the nasal segment [n] in word-final position in prehistory had any oral place of articulation. This view may be confirmed by the fact that this sound easily assimilated to the following oral stops as regards the place of articulation. Hence, a one-element make-up of [n] is quite probable in this particular position. The most likely candidate to be this prime seems to be the nasal element (N). Nevertheless, in the light of parallel developments of both the final [h] and [n], for example *h*-prefixation ([iNə 'hⁱelⁱdⁱ] *inna eilti* – ‘the deer’-acc.pl.) as well as *n*-prefixation ([iNⁱ 'Nⁱeχ] *in n-ech* – ‘the horse’-acc.sg.) to word-initial vowels, one might be led to assume that the low tone (L) is an equally good solution. What is more, viewing both these prefixations as tonal effects would simplify the workings of the system. In particular, both *h*-prefixation and *n*-prefixation as well as [f]-formation and nasalization of obstruents would be perceived only as tonal operations.

Be that as it may, the present analysis will not deal with the problem of which of these two elements should represent nasalization because we are interested

here in the phenomenon of nasalization in terms of formal structure. In the remainder of this chapter the nasal component will be represented by (N/L), which means that nasality and voicing may be two sides of the same coin and there is no point in deciding which symbol to use.²⁹

2.5.3. *n*-prefixation

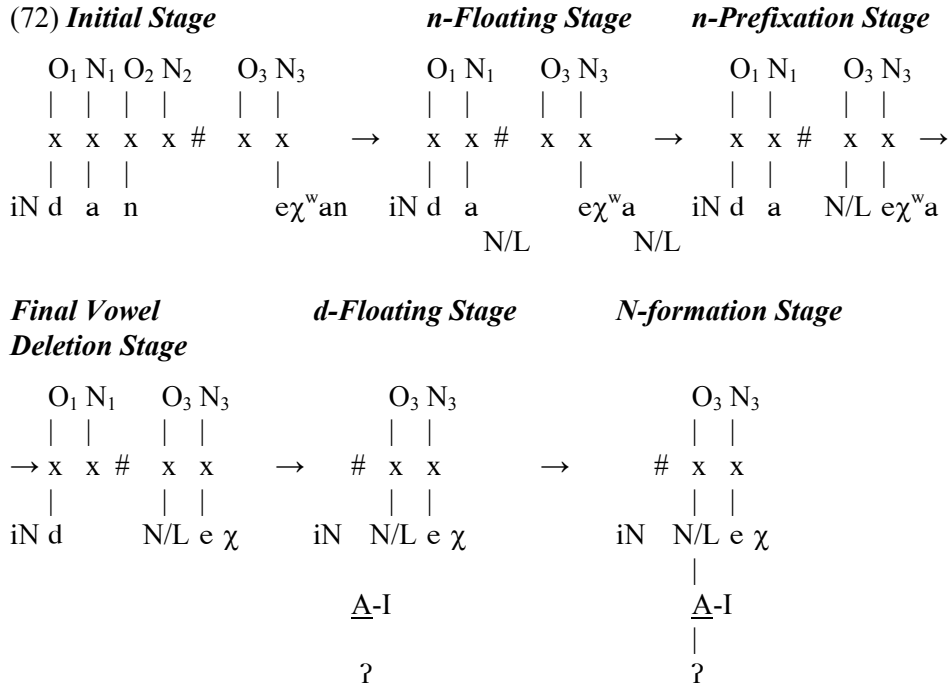
The phenomenon of *n*-prefixation occurs in lexical items beginning in vowels. What must be made clear at the outset is that the exact quality of the prefixed nasal, that is, whether we are dealing with [n] or [N], is not certain. The scholars of Old Irish either carefully avoid this issue (Pokorny 1914; Thurneysen 1946; McCone 1996) or employ either phonetic symbol to refer to the sandhi-*n*. For example, Lehmann and Lehmann (1975) and Ahlqvist (1994) use the lax [n], while Lewis and Pedersen (1974) and Quin (1975) transcribe the sandhi-*n* as [N]. Below we will propose that both [n] and [N] should be used in the transcription and that the choice should not be accidental. It will be claimed that there were two *n*-prefixing contexts in Primitive Irish and that they ought to be treated as distinct. The forms [iNⁱ 'Nⁱeχ] *in n-ech* – ‘the horse’-acc.sg. and [ə 'Nⁱeχ] *a n-ech* – ‘their horse’ will serve as examples.

As shown in (69), early in prehistory the acc.sg.masc. definite article ended in a nasal, which was later shifted to the beginning of the noun. A detailed derivation of *in n-ech* – ‘the horse’-acc.sg. is as follows: *indan eχ^{wa}n → *iNda neχ^{wa}a → *iNdə neχ^{wa}ə → *iNd neχ → [iNⁱ 'Nⁱeχ]. The final phase, that is Old Irish, differs from the penultimate stage *iNd neχ in that the article no longer ends in the dental stop, while the prefixed nasal is tense (Lewis and Pedersen 1974:113). The reason why this nasal is tense is never accounted for in the existing analyses. The only quasi-cause of this tenseness is that all word-initial sonorants in non-leniting environments are believed to have been tense in Old Irish and since the one in [iNⁱ 'Nⁱeχ] *in n-ech* – ‘the horse’-acc.sg. precedes a stressed vowel and actually belongs to the stressed word, it is *ipso facto* strong. Our task now is to try to pinpoint the reason behind this property of the nasal segment and decide if it can be explained in terms of phonology.

Thus, what we are dealing with superficially is the deletion of one segment, namely [d] → ∅, and the fortition of the other, that is [n] → [N]. This development bears a striking resemblance to what could be observed in leniting and non-leniting contexts described above. In particular, we saw the apparent reduction of [d] → ∅ and the fortition of [h] to [t], e.g. *iNd heχ → [iNⁱ 'tⁱeχ] *int ech* (see

²⁹ Nasukawa (1998) and Ploch (1999), among others, argue that the properties of nasalization and voicing can be both represented by the same element (N), either headed or headless.

(32) above for details). Consider the detailed development of the phrase *indan eχ^wan → *iNda neχ^wa → *iNd neχ → [iNⁱ 'Nⁱeχ] *in n-ech* – ‘the horse’-acc. sg., which is comparable to that of *t*-prefixation illustrated in (32). Now we are dealing with the floating [n], which is represented by the element (N/L), while the floating [d] by (A-I, ?):



The Initial Stage shows the Insular Celtic form *indan eχ^wan. The lax nasal [n] is associated with the onset position (O₂). During the *n*-floating Stage the onset (O₂) is deleted along with its skeletal position and [n], represented by the prime (N/L), becomes floating, that is, it is not linked to a skeletal slot. In the *n*-prefixation Stage the floating element (N/L) docks onto the noun-initial empty onset (O₃). In the Final Vowel Deletion Stage the article-final short vowel is delinked from (N₂), due to which the now article-final [d] and the prime (N/L) come to stand side by side. At the *d*-floating Stage the onset (O₁) is removed from the representation along with the skeletal slot, as a result of which [d] becomes a floating segment, i.e. it is not linked to a position. It is now represented by (A-I, ?). Finally, the *N*-formation Stage shows that the floating (A-I, ?) combine with the prime (N/L) under the noun-initial onset (O₃) to form the tense nasal [N].

At this point it seems proper to ask the question of why the sequence [dn] did not become petrified and survive until Old Irish similarly to the same cluster [dn] in leniting environments, e.g. [iNⁱ 'dⁱn^eRtⁱ] *ind neirt* – ‘of the strength’, which was shown in (51b). Compare the developments of these two phrases:

a. *indan eχ^wan → *iNda neχ^wa → *iNd neχ → [iNⁱ · Nⁱeχ] *in n-ech*
– ‘the horse’-acc.sg.
b. *indi: nerti: → *iNdi nerti → *iNd neRt → [iNⁱ · dⁿi^eRtⁱ] *ind neirt*
– ‘of the strength’

In the stage which immediately preceded Old Irish, the sequence [dn] was apparently the same in both these phrases. What surfaces noun-initially in Old Irish is no longer identical, though. The tense sonorant [N] appears in [iNⁱ Nⁱeχ] in (73a) while the sequence [dn] remains unchanged in [iNⁱ dⁱnⁱeRⁱtⁱ]. The reason for this may be that in the weakening context in (73b) the nasal segment [n] was a full-fledged phonological expression whose structure was (A-I, N/L), while the sandhi-*n* in *iNd neχ was simply the floating (N/L) which could combine with a regular consonant to produce a stronger segment. Let us recall that in leniting and non-leniting contexts only the high tone (H) was able to combine with selected segments, e.g. (H) + [d] = [t], (H) + [w] = [f] but there were no element fusions whatsoever which involved other single primes, not to mention mergers of two segments, both of which would be composed of more than one prime. Thus, it seems that, following Gussmann (2001), who names two seemingly identical segments which behave in dissimilar ways in the same system double agents, we need to propose a phonological distinction between the two segments [n]: one was word-final and participated in *n*-prefixation, e.g. *indan eχ^{wa}n → *iNda neχ^{wa} – ‘the horse’-acc.sg., while the other occurred in lexical items in other intervocalic positions and never underwent changes, e.g. *indi: nerti: → *iNdi

nerti – ‘of the strength’. The structure of the *n*-prefixing expression would be only one element (N/L), whereas that of the other sound should be (A-I, N/L).

Now the idea that nasality should be represented by the low tone (L), parallel to the floating high tone (H), seems to be reasonable from the systemic viewpoint because both *h*-prefixation and *n*-prefixation and, consequently nasalization and lack of lenition, respectively, could be viewed as tonal operations: any mergers involve only tones. This is just one argument, though, and it should be borne in mind that it is not conclusive.

Let us now return to the problem of the distinction between the lax and tense nasals. It was not always the case that the lax nasal segment or the floating (N/L) found local element support to form a tense variant in Old Irish. The development of *iNd *neχ* into [iNⁱ 'Nⁱeχ], reveals that the tense nasal can be perceived as an amalgam of two merged segments, i.e. [d+n]. If we now look at Old Irish phrases with the third person plural possessive pronoun, which also allegedly display the tense nasal, e.g. [ə 'Nⁱeχ] *a n-ech* – ‘their horse’, we can see that the tense nasal also phonetically occurs at the left-hand edge of the noun. This phrase has a different history, however. Compare the relevant stages of development of [ə 'Nⁱeχ] *a n-ech* – ‘their horse’ (74a) juxtaposed with those of [iNⁱ 'Nⁱeχ] *in n-ech* – ‘the horse’-acc.sg. (74b) repeated below for convenience:

(74)

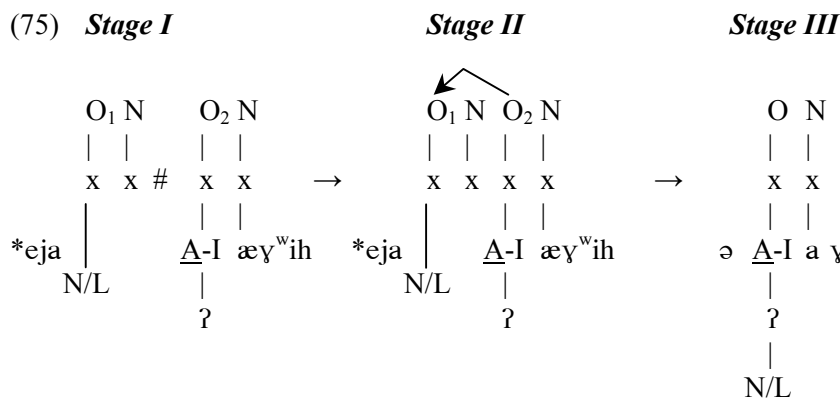
- a. *ejan eχ^{ah} → *eja neχ^a → *eja neχ → [ə 'Nⁱeχ]
 b. *indan eχ^{an} → *iNda neχ^a → *iNd neχ → [iNⁱ 'Nⁱeχ]

The development of [ə 'Nⁱeχ] *a n-ech* – ‘their horse’, clearly shows that there was never any [d] to combine with the floating (N/L) to produce [N], unlike in the form [iNⁱ 'Nⁱeχ] *in n-ech* – ‘the horse’-acc.sg., where the fusion of [d+n] took place, as shown in (72). Thus, the nasal in [ə 'Nⁱeχ] was either tensed for some inexplicable reasons, e.g. Old Irish levelling, or it was not tense at all. Whatever the Old Irish pronunciation of this phrase might have been, there seems to be no phonological reason for claiming that in the Old Irish *a n-ech* – ‘their horse’ the sandhi nasal was tense. This amounts to saying that the transcription of this expression should be [ə 'nⁱeχ]. In the following section we will examine eclipsis on consonant-initial words.

2.5.4. Nasalization of voiced stops

Now let us turn to the other two effects of nasalization, that is the alternation of consonants resulting from eclipsis. First, let us consider the Primitive Irish transformation of voiced stops into the homorganic nasals: [b] → [m], [d] → [N] and

[g] → [ŋ]. This historical phenomenon will be illustrated by the close syntactic group [ə 'Naɣⁱ] *a ndaig* – ‘their fire’. Similarly to the example of *n*-prefixation discussed above, e.g. [iNⁱ 'Nⁱeχ] *in n-ech* – ‘the horse’-acc.sg., the Old Irish version of this possessive pronoun+noun sequence displays the noun-initial nasal [N]. Here again the historical development of the group **ejan dæɣ^{wih}* → **ēja ndæɣ^{wi}* → [ə 'Naɣⁱ] *a ndaig* – ‘their fire’ indicates that this dental segment originates from the merger of the floating nasal [n], represented by the element (N/L) and the dental oral stop [d]. The essential difference is that in the case of [iNⁱ 'Nⁱeχ] the tense nasal originated from the prehistoric sequence [dn] (*iNd neχ), while here the linear order was reverse, that is [nd] (*ndæɣ^{wi}). Otherwise the quality of the input and the result are identical, which indicates that the different order of the component parts had no impact on the further development of the tense nasal. The relevant stages of development, i.e. **ejan dæɣ^{wih}* → **ēja ndæɣ^{wi}* → [ə 'Naɣⁱ] – ‘their fire’, are graphically represented below, the prime (N/L) stands for the floating segment [n], while (A-I, ?) for [d]:

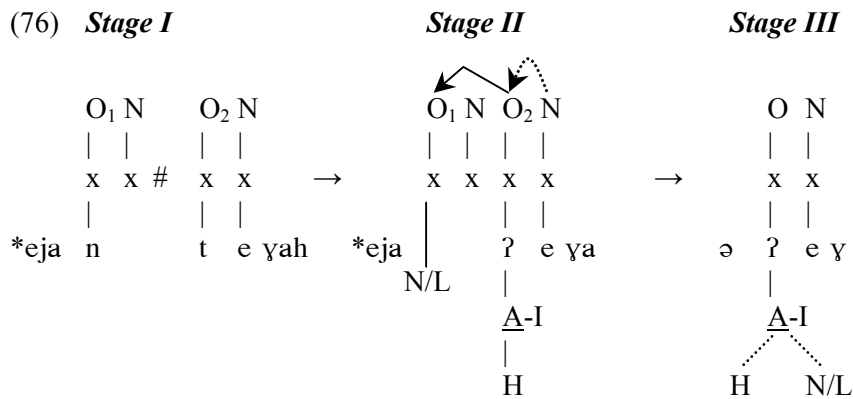


At Stage I above the two onsets (O_1) and (O_2) formally belong to two separate words, while in the second phase interonset government between them seems to have been established. The nasal segment in (O_1), consisting only of the element (N/L) agrees with respect to the place of articulation with the onset (O_2), occupied by [d], having the structure (A-I, ?), which implies that (O_2) performs the function of the governor in this relationship. In Stage III, all the primes previously constituting two segments, the dental oral stop and the lax nasal, have merged into one expression, that is the tense nasal [N] with the element structure (A-I, ?, N/L). In Chapter Three it is argued that some tense sonorants are geminates. This is a possibility word-initially too, but here we ignore this for the sake of simplicity.

A similar adjustment can be also observed in labials, e.g. *ejan bænna: → *eja mbenna → [ə 'mⁱeN] *a mbenn* – ‘their peak’, where the place assimilation is even more conspicuous, and in velars, e.g. *ejan g^wedija: → *eja ngudeja → [ə ŋuðⁱe] *a nguide* – ‘their prayer’. Thus, the development shown in (75) confirms the structures proposed in (2.1.6.) in that eclipsis enhances the make-up of the original voiced stops by one prime (N/L), i.e. [b] (U, ?) → [m] (U, ?, N/L), [d] (A-I, ?) → [N] (A-I, ?, N/L), [g] (@, ?) → [ŋ] (@, ?, N/L).

2.5.5. Voiceless stops in nasalizing contexts

Now let us inspect the voicing of original voiceless stops in nasalizing contexts. The development of *ejan teyah → *eja deya → [ə 'dⁱeY] *a teg* – ‘their house’ will serve as an example. Assuming that nasalization manifests itself in a uniform fashion, that is as the addition of the prime (N/L), it must be presupposed that also here we are dealing with place-assimilation which subsequently leads to the formation of a new segment.



The first phase shows two onsets (O_1) and (O_2) which are independent of each other. At Stage II a governing relation is established between the governor (O_2), whose element structure is (A-I, ?, H), and the governee (O_1), with the structure (N/L). As a result, place assimilation occurs. So the previously unspecified nasal is now dental under the influence of the following stop. Finally, Stage III reveals that all the elements formerly belonging to two segments have fused to be realized as [d]. This interpretation immediately poses the question of what the structure of this new segment is, because the element make-up of the original [t] seems to be enriched after eclipsis. Let us recollect that in this chapter we have been taking it for granted that [t] consists of (A-I, ?, H) while [d] of (A-I, ?). To put it plainly, the voiceless segment is stronger and richer in terms of element

complexity. Now, assuming that eclipsis entails the spreading of (N/L), the newly formed [d] must contain more elements than [t], that is (A-I, ?, H, N/L). It is impossible to decide whether that was the case in Stage III, hence the (hypothetical) dotted association lines between (O₃) and the primes (H) and (N/L).

At first glance the structure (A-I, ?, H, N/L) may be frowned upon for a few reasons. First, we postulate a new structure for a segment whose make-up we seemingly already know. Second, the idea that one segment contains so many elements in a minimalist approach (we have already reduced the number of primes by eliminating (h)) appears rather awkward. Third, the presence of both the element responsible for voicelessness (H) and the one standing for voicedness (N/L) should produce an unpronounceable segment in a language which does not employ tones in the way tone languages do.³⁰ Or, perhaps, the resulting sound would be voiced and aspirated, e.g. [d^h], or nasal and aspirated, e.g. [n^h].

All the same, it is likely that two primes providing contradicting properties cannot be licensed by the skeletal position and are automatically excluded from the structure. Formally, we may propose a constraint according to which the elements (H) and (N/L) do not combine and must be both suppressed.

Thus, it seems proper to conclude that for some short time, just after nasalization, two segments [d] functioned in Primitive Irish: one radical, having the structure (A-I, ?), while the other, obtained due to eclipsis, containing (A-I, ?, H, N/L). It is unlikely that they survived long because the radical structure, containing all the salient properties, was sufficient to represent [d] in the system.

2.5.6. Voiceless fricatives in nasalization environments

Let us now turn to the effects of nasalization occurring in voiceless fricatives. Let us recall that [s] does not undergo this process (it is simply doubled in writing e.g. [i 'salm] *i ssalm* – 'in the psalm'), while [f] is transformed into its voiced counterpart [v] in Old Irish.

As regards [s], the reasons why this segment was not affected by nasalization are unknown. Given that all the voiceless obstruents surfaced as voiced in nasalization contexts, [s] would have to be realized as [z], which is not confirmed in the relevant literature. From the perspective of Modern Irish, where eclipsis can be perceived as the suppression of the tone (H), the situation seems clear: such an operation is unlikely to take place in the case of [s] because the result would be [r] (Cyran 1997:192ff.). When we turn to Primitive Irish, we may face similar restrictions. In particular, if the element make-up of [s], that is (A, H), were enhanced by the prime (N/L), the resulting structure would be (A, H, N/L). It has

³⁰ Two tones in one segment are not impossible in principle. They can occur side by side, especially in tone languages (Harris 1994:135).

already been argued that structures containing the two opposite tones were probably reduced, which would result in (A) in this case. However, as we remember from (13), this is the make-up of [R] and the occurrence of [R] as an eclipsed variant of [s] would complicate the system. Another possibility comes from Modern Irish too. According to Ó Siadhail (1989:114), some dialects of Modern Irish do display [z] in eclipsis contexts. We have no knowledge of Old Irish dialectal variations but a supposition that there was a dialect in which [z] surfaced as an eclipsed variant of [s] cannot be rejected. Such a process may have taken place on some scale and could have ceased to be active due to the influence of other dialects or even the impact of Brittonic, where the eclipsis of [s] never occurred. Whether or not these are accurate hypotheses is difficult to say. No other logical solution can be offered at this stage of research.

Turning to [f], we must remark that, at the time of eclipsis, there was no [f] to be nasalized. As shown in (2.3.4.), the predecessor of this voiceless fricative was [w], and this segment found itself in a nasalizing context. Consider the development of this glide in an eclipsing context reproduced after McCone (1996:120):

(77)	<i>Nasalization</i>	<i>Old Irish</i>
	*indan weran → *iNdan veran → *iNda vera → [iNə 'v ⁱ er] <i>inna fer</i> – ‘of the men’	

This chain of events shows that the original noun-initial [w] was transformed into [v] under the influence of the article-final nasal [n]. This nasal was subsequently dropped and the resulting Old Irish form was [iNə 'vⁱer]. A similar change was observed word-medially, e.g. *an-wiss → *anvⁱh → [anⁱəvⁱ] *ainb* – ‘ignorant’, *widwa → *wiðva → [fⁱedəv] *fedb* – ‘widow’ as well as *marwos → *marvah → [marəv] *marb* – ‘dead’.³¹ It seems, then, that the original glide [w] was spirantized in the vicinity of a non-voiceless segment only. McCone (1996) observes, however, that these changes are clear only from the Old Irish evidence. Thus, it cannot be ascertained which development was first, i.e. word-medial or initial, if there was any time difference between them. Nor can it be stated whether we are dealing with a phonologically triggered process in either case.

Let us also recall that in *h*-prefixing contexts the glide [w] was spirantized into [f], e.g. *iNdah werah → *iNda fera → [iNⁱ 'fⁱer] *in fer* – ‘the man’, where we held the tone (H) responsible for this change. If we look at the developments of [w] in *indan weran → *iNdan veran and *iNdah werah → *iNda fera, the resemblance between them is striking. The difference is in the nature of the pre-

³¹ Vowel epenthesis in these cases is discussed in Chapter Three.

ceding segment and in the assumption that in *indān weran → *iNdan veran the nasal remained after the following glide had been spirantized. There seems to be no tangible evidence, however, to counter the logical assumption that the nasal was dropped after spirantization and that the two developments were alike. Consider the hypothetical parallel changes in both *h*-prefixing and nasalizing environments:

(78)

- a. *iNdah werah → *iNda fera → [iNⁱ fⁱer] *in fer* – ‘the man’
 b. *iNdan weran → *iNda vera → [iNə ‘vⁱer] *inna fer* – ‘of the men’

Briefly, [h+w] = [f], while [n+w] = [v]. In terms of elements, (H)+(U) = (U, H), whereas (N/L)+(U) = (U, N/L). Given that final [h] and [n] were lost or attached to the following lexical items at more or less the same time, the idea that they contributed in a similar fashion to the development of the glide [w] into [f] and [v], respectively, seems justifiable. Thus, we need to posit the presence of another double agent in Primitive Irish: [v] obtained due to the spirantization of [w] has the structure (U, N/L), while [v] which results from the lenition of [b] contains (U) only. Whether this state of affairs continued into Old Irish is unsettled.

What also remains unsolved is the problem of spirantization of [w] into [v] in the vicinity of voiced sounds, e.g. *widwa → *wiðva – ‘widow’ and *marwos → *marvah – ‘dead’. Neither [d] nor [r] seem to have contained the element (N/L), in which case the voicing and spirantization of the glide must have been somehow different in these examples. At this stage a straightforward solution cannot be offered, though.

2.5.7. Resonants in nasalizing contexts

Finally, let us concentrate on the behaviour of resonants in nasalization environments. The four segments: [m], [N], [L], [R], apparently did not undergo change in these contexts. Consider the example of *inna ríga* – ‘of the kings’-gen.pl.

(79)

*sindoihan Ri:yan → *indoja Ri:ya → [iNə ‘Ri:ya]

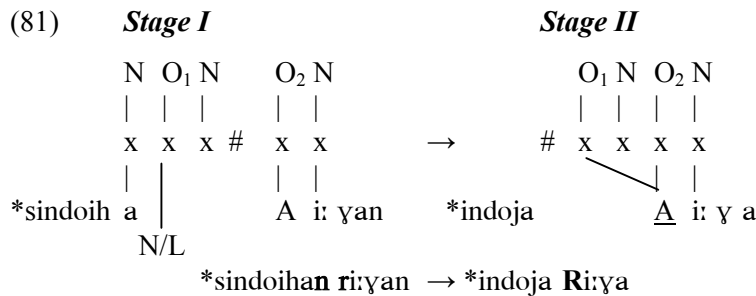
This interpretation is based on the assumption that the lax resonants, that is [n], [l], [r], were tensed to [N], [L], [R] as early as in Insular Celtic, and the Primitive Irish eclipsis did not have any impact on them (McCone 1996:120). The same hypothesis is offered as regards the tensing of resonants in *h*-prefixing contexts, e.g. *sindos ri:s → *indah Ri:h → *iNda Ri: → [iN ‘Ri:] *in rí* – ‘the king’.

However, it was argued in (2.3.6.) that in *h*-prefixing contexts the development of the tense resonants [N], [L], [R] can be accounted for in terms of gemination which took place at the expense of the final [h]. In particular, we posited the changes of *sindos ri:s → *indah ri:h → *iNda Ri: → [iN 'Ri:] *in rí* – ‘the king’, which means that the tensing of [R] occurred when the article-final [h] had been dropped. By analogy with this development, we can propose that the strengthening of the original lax resonants in nasalizing contexts was in fact a process of gemination at the expense of the final [n]. This is shown below:

(80) **Tensing Stage**

*sindoihan ri:yan → *indoja Ri:ya → [iNə 'Ri:ya] *inna ríga*
– ‘of the kings’ gen.pl.

The changes in (80) show that the original noun-initial lax [r] stood side by side with the article-final [n] and that the liquid surfaced as [R] only after the nasal had been dropped. In (2.3.6.) we also argued that the disappearing final [h] did not enhance the element make-up of the newly formed tense resonants. What was taken over by these segments was the skeletal position vacated by the fricative. In (80) the situation was probably the same. The final nasal left its position for the noun-initial resonant to occupy and no element change took place. The double linking of the elements which made-up the resonant resulted in the tensing of these segments. This is graphically represented below (the element (N/L) stands for the nasal, while the prime (A) for [r]):



In Stage I the nasal is linked (O₁), while the lax liquid to (O₂). At Stage II the nasal has been dropped and the position (O₁) is taken over by the liquid. Due to being doubly linked, the lax liquid [r] is tensed to [R]. A side effect is the headedness of the element (A).

Therefore, the Irish resonants need not be viewed as segments which resisted nasalization. They may be perceived as lax sonorants which became tense in

nasalizing contexts in the same way as they were earlier tensed in *h*-prefixing environments. The only difference is the type of the tone, which was high in *h*-prefixation but low in nasalization.

2.5.8. *Nasalization – summary*

The phenomenon of eclipsis, which started as the phonological merger of two nasal+voiceless stop clusters, played a prominent part in the phonology of the Irish system before the period of Old Irish. This process, however, does not have much in common with the other one, that is lenition. On the contrary, nasalizing contexts have been shown to bear a resemblance to those where lenition was absent in stops, where gemination occurred in resonants, where [f] was formed, and where [h] was prefixed to vowel-initial lexical items. Taking the phenomenon of *n*-prefixation to vowel-initial items as a point of departure, it has been argued that this type of affixation, which is found in nasalizing environments, was comparable to *h*-prefixation in geminating contexts. As regards the effects of nasalization on obstruents, it has been shown that it consisted in the propagation of the element (N/L) which enhanced the make-up of the radical voiced stops. The original voiceless stops were apparently enriched with this prime for a short time, but due to the inability of co-existing with the high tone (H), both the elements providing the properties of voicing and voicelessness were suppressed. It has also been proposed that the nasalizing contexts, similarly to *h*-prefixing environments, contributed to the origin of tense resonants in that they provided the original lax sonorants with a skeletal position to spread their melody onto. Finally, it has been hypothesized that the origin of the segment [v] in eclipsis environments was parallel to the formation of [f] in *h*-prefixing contexts.

2.6. Conclusions

In this chapter the developments of selected phonological phrases since Proto-Celtic until Old Irish have been analyzed. The aim of this discussion was to demonstrate that many incongruous Old Irish phenomena, such as the lenition of [s] to [f] or the occurrence of radical consonants after vowels of the preceding closely connected words for example, which must be synchronically viewed as morphophonological, can be accounted for in terms of phonology provided that they are analyzed from a diachronic perspective.

Taking Old Irish lenition as a point of departure, it was assumed that stops and fricatives lose one prime when weakened. The incongruous lenitions of [f] to [ø] and [s] to [f] were found synchronically exceptional. As a result of a diachronic analysis, we discovered that these lenitions could be neatly explained as element decomposition and composition, respectively. There were two other

findings of this analysis. One was the conclusion that the pre-Old Irish phonology made no difference between historical weakening and non-leniting contexts. The other was that a reinterpretation of radicals occurred in the Primitive Irish system, i.e. the historical radical [w] was replaced by the radical [f] by analogy with a development occurring in close syntactic groups.

The origin of the Old Irish tense sonorants [N], [L], [R] was also connected with the development of original lax resonants in close syntactic phrases. It has been argued above that the sonorants were first tensed in *h*-prefixing (and later *n*-prefixing) contexts and then all no-mutation sites were treated by the system in a uniform fashion. The occurrence of lax and tense sonorants in Old Irish in leniting and non-leniting contexts, respectively, was a result of historical changes which indicate that their distribution was complementary but had nothing to do with lenition as such.

Another issue connected with the fact that pre-Old Irish phonology treated weakening and non-leniting contexts in the same way was *t*-prefixation. Given that *t*-prefixation took place both in items which were lexically vowel-initial and *s*-initial, it has been claimed that this phenomenon occurred only in the environments which were previously affected by either *h*-prefixation or by the lenition of [s]. The necessary factor was also the availability of the segment [d] in the immediate vicinity of [h].

In the part devoted to nasalization, we discovered that this prehistoric mutation had much in common with *h*-prefixing or geminating sites, but it did not resemble lenition in any way. We found that the tense Irish resonants first surfaced in both eclipsing and geminating contexts, and that *n*-prefixation to vowel-initial items was parallel to *h*-prefixation. Also the development of the prehistoric glide [w] into the Primitive Irish [v] and [f] was apparently similar in these two environments. As for the eclipse of stops, it has been argued that the floating prime (N/L) was added to the structure of the radical segments. In the case of voiced stops, this addition resulted in their transformation into the corresponding nasals. As regards the voiceless stops, we did not find evidence to either prove or disprove the view that the prime (N/L) contributed to their element make-up. However, taking a systemic viewpoint, it has been hypothesized that although (N/L) was initially added to their structures, it had to be suppressed along with the prime (H) due to a systemic constraint according to which these two elements could not combine in one segment.