

Old English <cg> and its sound correspondences in Old English and Middle English¹

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This article seeks to identify the phonetic correspondence(s) of the digraph <cg> in Old English (OE) and Middle English (ME), assessing a range of sources: the etyma in early Germanic (Gmc) languages, the various spellings in OE and the spelling evidence in the *Linguistic Atlas of Early Middle English*. Almost all the textbooks on OE claim that <cg> was pronounced /dʒ/, i.e. as a phonemic affricate, in OE. Evidence is thin on the ground, and the argument rests on certain back spellings <cg> for words with etymological <d+g>, e.g. *midgern* <micgern>. Words with <cg> in OE go back to Gmc *g(g)j, which subsequently underwent palatalisation, and eventually assibilation and affrication. This article argues that the value [jj] is more likely for OE and early ME, and that such an interpretation agrees with the available spelling evidence for both OE and ME, in that there is not one <d>-type spelling in the entire historical corpus until late ME. It is also argued that the development of the voiced (pre-)affricate was later than that of its voiceless counterpart, as voiced fricative phonemes are a late, and infrequent, development in Gmc. Moreover, it is likely that the development of /dʒ/ was affected by the high number of French loans with /dʒ/ which entered the English lexicon after 1066. Thus, the English system of consonant phonemes may not have acquired /dʒ/ until the thirteenth century at the earliest.

Keywords: phonology, Old English, digraph <cg>, affricates, ME spellings

1 Introduction

Most elementary grammars of Old English (OE), as well as textbooks on the history of English, state that the digraph <cg> was pronounced as [dʒ], that is, a voiced post-alveolar affricate (Sweet/Davis 1983: 4; Quirk & Wrenn 1989: 16; Mitchell & Robinson 1992: 16). Even the reference grammars, however, provide little evidence in support of this claim, beyond (a) a few seeming cases of affrication across OE morpheme boundaries (so, e.g., *micgern* ‘fat’ from **mid+gern*, cf. *orceard* ‘orchard’ from **ort+geard*), and (b) the reflex of this segment as [dʒ] in

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Present-day English (PDE): so, for example, Campbell (1959: 173–9), Wright & Wright (1928: 167), Sievers (1968: 143–55). Rather, the assumed development of [dʒ] in OE, along with that of its voiceless counterpart [tʃ], is presented as an outcome of the Anglo-Frisian palatalisations of [k] and [g] in contact with front vowels: this makes it cohere with a larger chapter in the history of OE phonology, on which it then seems to depend. Otherwise, the topic seems to have attracted little further attention, with the exceptions of Weřna (1986) and Minkova (2003, 2014, 2016, 2019).

Nevertheless, in its own terms the OE digraph <cg> seems remarkably ill-suited as the correspondent of a sound-segment [dʒ]. OE <c> usually corresponds to [k] or its palatalised reflex [tʃ]/[ç]² (as well as, though mainly in early Old Northumbrian in absolute final position in unstressed words, the fricatives [ç] and [x]), whereas OE <g> corresponds to [ɣ] or its palatalised reflex [j], or to [g] or its palatalised reflex [j] (at first only in combination with [ŋ]). The digraph <cg> thus appears to represent a cluster consisting of a *voiceless* velar or palatal consonant followed by a *voiced* velar or palatal consonant. The sequence {voiceless+voiced} is hence supposed to represent the {voiced+voiced} sequence of [dʒ], with no trace, moreover, of the affricate's palatoalveolar onset.

Ladefoged & Maddieson (1996: 90) define affricates as 'stops in which the release of the constriction is modified in such a way as to produce a more prolonged period of frication after the release'. Affricates are thus typically homorganic and are seen as one segment; examples are [pf, ts, dʒ, kx]. I will use the term 'phonetic affricate' to refer to any realisation that fits the above definition, and the term 'phonemic affricate' to refer to a (phonetic) affricate which is distinctive in a given language.

The primary aim of the present article is to argue that OE <cg> did not correspond to [dʒ], that there is no evidence for a phonetic or phonemic affricate until late Middle English (ME) and that there are better candidates than [dʒ] for the sound correspondence of OE <cg>, which are bisegmental. My findings thus support Minkova's main arguments regarding the development of affricates in English (2003, 2016, 2019), although my conclusions were arrived at independently, were drawn from a very different set of data and take Minkova's conclusions one step further.³

The Present-day English (PDE) reflexes of OE words with <cg> testify to two diverging historical developments: (a) /dʒ/ in nouns like *edge*, *bridge*, *ridge* (OE *ecg*, *brycg*, *hrycg*), or (b) /eɪ/ or /aɪ/ in the verbs *say*, *lay*, *lie*, *buy* (OE *secgan*, *lecgan*,

² That the OE reflex of palatalised *k* may have been [c] or [ç] rather than [tʃ] is the author's personal view and is based on the absence of <t> in the relevant lexis in the OE corpus. It is not a widely held opinion, but Minkova (2014: 81–2) entertains similar views; she suggests [c/kʰ] for palatalised *k* in classical OE. See further the discussion in section 2.

³ Minkova's articles (2016, 2019) were brought to my attention late in the process of writing this article.

licgan, bycgan). The second aim of this article is to determine when and where the diverging developments began.

Until recently, the evidence adduced for the sound correspondence of OE <cg> has been of two kinds: comparative evidence from the prehistory of OE <cg> words in other early Germanic (Gmc) languages, and spellings co-variant with <cg> in OE texts. To the latter group belongs evidence pertaining to the development to /dʒ/ of consonant clusters in words which do not belong etymologically to the OE <cg> words, e.g. *micgern, singe* ‘to burn lightly’. Additionally, ME spelling evidence has been used to argue for the terminal value [dʒ] in ME, but has not hitherto been used to shed light on the likely OE sound correspondence(s) of <cg>.

With the publication of *LAEME* (Laing 2008), there is now a substantial body of spelling material for early ME, which may be used to infer much about the phonology of early English. The present article seeks to re-examine the available evidence for the sound correspondence of OE <cg> and to offer a new interpretation as to the likely pronunciation of OE <cg>. I examine some 1,500 spellings for OE <cg> words in *LAEME*, with a view to answering the following questions: (1) Are the ME spellings consistent enough, lexically and diachronically, or in individual texts, for any patterns to be detected? (2) If so, is it possible to establish the likely OE and ME sound correspondences of <cg>? (3) Had the diverging developments of nouns and verbs started in the period investigated? (4) To what extent did the sound development of OE <cg> depend on word-class, analogy, paradigmatic levelling and position within the word?

Section 2 examines the prehistory of OE <cg> words in an attempt to determine the sound cognates of <cg> in the other early Gmc languages. Section 3 gives a summary of the suggested path(s) of change from Gmc *-gj- to PDE /dʒ/ as offered by previous scholars. Section 4 presents and discusses the spellings for OE <cg> in *LAEME*. I offer my suggestion for the sound correspondence of OE <cg> in section 5, and I outline the path of change to PDE /dʒ/ in section 6. Section 7 gives a summary of the findings of this article.

2 The etymology of OE <cg> words in PGmc

The inferred Proto-Germanic (PGmc) forms of words with OE <cg> seem relatively certain: the cluster goes back to PGmc *-gj- (*OED Online*), and the sound value was probably [gj] or [jj] (where [j] is the IPA symbol for the voiced palatal stop; [c] is the IPA symbol for the corresponding voiceless palatal stop). I shall refer to words which have reflexes of Gmc *gj, and which appear with OE <cg>, as ‘<cg> words’. Tables 1 and 2 show the spellings of the cognates of some of the most common OE <cg> words in the other early Gmc languages, as well as their later developments (in italics).

It seems quite clear that <cg> goes back to a geminated *g before *j in WGmc (West-Gmc Gemination, cf. Campbell 1959: §407; Stiles 2013: 15); the *j was subsequently lost, but not before it had caused the palatalisation of the preceding velar

Table 1. *Gmc cognates and PDE reflexes of OE nouns with <cg>^a*

OE	brycg 'bridge'	ecg 'edge'	hrycg 'ridge'	mycg 'midge'	secg I ^b 'man, hero'	secg II ^c 'sedge'	wecg 'wedge'
PGmc ^d Gothic	*brugjō/ā	*agjō	*hrugjaz	*mugjō	*sagjaz *sagj-	*sagj-	*wagj-
O Fris O Du	brigge	egg, edze	hregg ruggi, rukgi		siā		
<i>M Du</i>	<i>brugghe</i>	<i>egghe</i>	<i>rugge,</i> <i>rucke</i>	<i>mugghe,</i> <i>mucke</i>			<i>wegge,</i> <i>wigge</i>
<i>Dutch</i>	<i>brug</i>	<i>egge</i>	<i>rug</i>	<i>mug</i>		<i>zegge</i>	<i>wegge</i>
OS	bruggia	eggia	hruggi-	muggia	segg		weggi
MLG	brugge		rügge, ruckge	mugge		segge	wegge, wigge
OHG	brucca	egga, ekka	hruggi, hrucki	mucca, mugga		sahor	weggi, wecki
<i>German</i>	<i>Brücke</i>	<i>Ecke</i>	<i>Rücken</i>	<i>Mücke</i>		<i>Saher</i>	<i>Weck</i>
ON ^e	bryggja	egg	hryggr	mȳ	seggr		veggr
<i>Norwegian</i>	<i>brygg(j)e</i>	<i>egg</i>	<i>rygg</i>	<i>mygg</i>	<i>segg</i>		<i>vegg</i>
<i>Swedish</i>	<i>brygga</i>	<i>egg</i>	<i>rygg</i>	<i>mygga</i>			<i>vigg</i>
<i>Danish</i>			<i>ryg</i>	<i>myg</i>			<i>vægge</i>

^aDu = Dutch; Fris = Frisian; OS = Old Saxon; LG = Low German; OHG = Old High German; MHG = Middle High German; ON = Old Norse. The spellings are taken from the *OED Online* and from Laker (2007).

^bOE *secg* I: 'man, warrior, hero'.

^cOE *secg* II: 'sedge'.

^dThere is disagreement over the last vowel of the reconstructed PGmc forms, but that is not relevant here. HEDGE (<PGmc **hagjō*) in all likelihood belongs to this group of words also.

^eThe NGmc forms are included for comparison: the same words that undergo gemination in WGmc, and which are the topic of investigation here, undergo other processes in NGmc, producing similar consonant clusters. The same applies to the NGmc forms in table 2.

stops in OE and Old Frisian.⁴ Hence, the values [gg(j)] and [ʃʃ(j)] seem probable in the early WGmc languages.

The Gmc velar stops **k* and **g* palatalised before front vowels in Pre-OE and in Old Frisian (Campbell 1959: §§426–30).⁵ The precise development of the palatalised singletons may have been as in (1). The values [tʃ] and [j] are assumed for Old English by most textbooks, although solid evidence for these terminal stages is much later, in the form of ME <(t)ch> and <y>.

⁴ The spellings suggest that OHG may have had variable devoicing of this geminate (which is in evidence also in Old Frisian and Middle Low German).

⁵ Scholars agree that an affricate [dz] had developed already in Pre-Old Frisian (Nielsen 2012: 67; Luick 1914–40: §687, Anm. 3); whether it was phonemic is of no relevance here.

Table 2. *The Gmc cognates and present-day reflexes of OE verbs with <cg>*

OE	bycgan 'buy'	hycgan 'think'	lecgan 'lay'	licgan 'lie'	secgan 'say'	þicgan 'receive'
PGmc	*bugjana	*hugjana	*lagjana	*ligjana	*sagjana	*þigjana
Gothic	bugjan	hugjan	lagjan	ligan		
O Fris			ledza, lega, leia	lidzia	sedza, sega WFr sizze	
<i>Dutch</i>			<i>ODu leggen</i>		<i>zeggen</i>	
OS	buggian	huggian	leggian	liggian	seggian LG seggen	thiggian
OHG		hucken	legen, lecken	liggen	sagēn	dikken MHG digen
<i>German</i>			<i>legen</i>		<i>sagen</i>	
ON	byggja	huga, hyggja	leggja	liggja	segja	þiggja
Norw.	bygge	hugsa, huske	legg(j)e	ligg(j)e	si(ge), seie	tigg(j)e
<i>Swedish</i>			<i>lägga</i>	<i>ligga</i>	<i>säga</i>	<i>tigga</i>
<i>Danish</i>			<i>lægge</i>	<i>ligge</i>	<i>sige</i>	<i>tigge</i>

- (1) [c] > [cj] > [cç] > [ç] <c> OR
 [c] > [cj] > [tj] > [tʃ] <c>⁶
 [ʃ] > [tʃ] > ([j]⁷) > [j] <g>

Thus, the velar stops seem to have gone through processes of ‘lenition’ (cf. Minkova 2016: 56), in addition to palatalisation and potentially other types of assimilation. ‘Lenition’ is a somewhat contentious concept and is traditionally defined as change which involves weakening of segmental strength, such as opening or sonorisation (Honeybone 2002: 39–43), along typical scales, as in (2).⁸

- (2) stop > affricate > fricative > approximant > vowel

When the Roman alphabet was adopted for the writing of English, the Insular hand was used, which means Irish (or British) scribes were probably involved. Alphabetic writing,

⁶ The changes in (1) are intended to indicate that the palatalised stop [c] probably developed a palatal glide, to [cj], which in turn may have either assimilated and fronted to [tj] via [tj], or developed into a palatal fricative [ç]; both would be lenition processes involving a decrease in the obstruction from a plosive to an affricate or fricative. The first path [c] > [cj] > [cç/tj/tç] > [ç] is evinced in Standard Eastern Norwegian (Haugen 1976: 268–72; Sandøy 1991: 182); the second [c] > [cj] > [(t)tj] (> [tʃ]) in some western dialects of Norwegian (Papazian & Helleland 2005: 3; Thorson 1973: 335; Voronkova 1981: 269); Haugen (1976: 268) explains the latter development as the merger between [cj] and pre-existing [tj], which could affricate and assimilate to [tç/tʃ]. The same dialects of Norwegian which have [(t)tj ~ tʃ] for the reflex of palatalised *k have [jj ~ (d)dj] for the reflex of palatalised *g (Haugen 1976: 271; Papazian & Helleland 2005: 53). A similar development from a voiceless velar plosive to a sibilant is seen in Latin k > Fr [c] > [tʃ] or [ts] > [ʃ], [s] (Pope 1934: §§283–5, 291–2).

⁷ IPA [j] is for the voiced palatal fricative.

⁸ Lass & Laing explain the process of lenition in some detail (2013: 98–9, n. 6).

runic or Roman, entails a broadly phonemic analysis, since the principle of alphabetic writing is that there is one letter for each distinctive/salient sound. This has interesting consequences for our interpretation of OE spelling: The various values which are assumed for <c> ([tʃ/ç] in *cirice* ‘church’ and [k] in *cyning* ‘king’) and <g> ([j] in *giet* ‘yet’, [ɣ] in *dagum* ‘days’ and [g] in geminates) must either (a) have been perceived as so similar that they could be represented by the same letter, or (b) have been understood as allophonic variants in complementary distribution – or indeed both.

That the Anglo-Saxons learned their Roman script from Irishmen raises another question: what values did <c> and <g> have in Old Irish (OIr) at the time? Thurneysen (1961) states that <c> corresponded to [k] or [g],⁹ and <g> had the values [ɣ] and [g]. The digraph <cg> is used very infrequently in OIr, but is an ‘etymological’ spelling, in e.g. <ecguisti> for <ecuisti> (*eg-guisti*) (Thurneysen 1961: 23). It is worth observing that OIr <cg> is not tautosyllabic, but straddles morpheme boundaries, like the OE clusters in *micgern*, *orcedard*. Thus, if OE spelling is informed by the spelling practice of OIr, the digraph <cg> in OE may indicate a geminate [ʃʃ], or [gɣ]/[jʃ] or [jʃ], or even [ʃʒ], whence it assimilated later to [dʒ].¹⁰ This in fact agrees both with the Gmc postulated *-gʒ- and the attested forms in the other early WGmc languages. However, the question is why Anglo-Saxon scribes would adopt a very rare OIr spelling *only* for this one consonant, and not for any others. Logically, recourse must be had to OIr only if no other reasonable account can be established; but see White (2017) for a different view of the relation between OIr and OE spelling.¹¹

3 Previous accounts of the likely sound value and development of OE <cg>

This section examines previous accounts of the sound value and development of OE <cg> words; for comparison, the assumed development of palatalised *k is sometimes

⁹ Old Irish had phonemic palatalisation, and it was the adjacent vowels which indicated in spelling whether the consonant was palatal or velar (Thurneysen 1961); for the purposes of this article, there is no need to elaborate this point.

¹⁰ Minkova (2019: 165), example (11), offers a similar conclusion.

¹¹ White (2017: 7) represents voiced and voiceless palatal affricates as /j/ and /ç/ (IPA /dʒ/ and /tʃ/), respectively, and indicates length/gemination by doubling the symbol. He believes OE spelling is based on OIr spelling, and, more specifically, that OE <cg> corresponded to /j(j)/ (2017: 17), i.e. IPA [dʒ(dʒ)]; the affricate was either a singleton or a geminate intervocally, and a singleton finally. White later states that Campbell is right in stating that <cg> is due to Irish influence, in that ‘Irish spelling uses post-vocalic <c> to mean /g/. But this observation misses a much more important point: spellings of the mixed voice ... type, including <cg>, both 1) occur in the spelling of OI ... and 2) actually make sense’ (2017: 17). They make sense in that clusters such as <pb> and <cg> are used to correspond to a *voiced* intervocalic *plosive* across morpheme boundaries in Irish (and OE <cg> was often found at morpheme boundaries), because there was no other unambiguous orthographic means available. White explains that the scribes may have used this spelling device in OE because they heard two types of geminate /gg/, one velar and one palatal, and that they chose to use <cg> for the palatal geminate. However, a palatal geminate /gg/ is [jj], not [dʒdʒ], and White states that OIr uses the ‘mixed voice’ spelling <cg> to indicate a *voiced plosive*, again pointing to [j] or [g], not [dʒ(dʒ)]. It is possible that White merely suggests that the *principle* of <cg> is based on Irish spelling with ‘a non-literal meaning’ (2017: 17), but that <cg> in Irish and <cg> in OE corresponded to different sounds. It still does not make perfect sense, however, since the principle behind OIr <cg> is to indicate a *voiced plosive* in intervocalic position, not to indicate an affricate.

included, although I do not believe that the developments towards the terminal values /tʃ/ and /dʒ/ were exactly parallel (cf. Lass 1994; Minkova 2016). Part of the reason is that lenis fricatives were allophonic at best in the old Gmc languages, and their development into distinctive phonemes is generally late. Some structuralists do not like asymmetries in phoneme systems, but asymmetrical systems are not really rare; e.g. Norwegian and Swedish still do not have voiced fricative phonemes.¹² The very fact that the two velar stops as a result of Pre-OE palatalisation produced sounds that differed in manner of articulation shows that they did not and need not develop along the same paths: *k produced a palatal stop or fricative (*ditch*, *leech*), whereas *g produced a palatal approximant [j] which eventually vocalised (*day*, *dry*; Minkova 2016: 38).

First, let us consider the OE spellings for <cg> words. Campbell (1959: 27) states that the oldest spelling found in these words is <gg> (*Épinal Glossary*, late seventh century), whereas the *Moore Bede* and the *Corpus Glossary* (both eighth century) have <cg>, and the *Erfurt Glossary* (c. 800–50) has both. Other OE variants are <gc>, <ccg>, <cgg>, <gcg>, <ggc>, <gc>;¹³ <cg> is also used for words with assumed OE [g:], such as DOG and SHAG.¹⁴ Waxenberger (2017) finds no <cg> words represented in the limited OE runic corpus, but OE runes sometimes distinguish between velar and palatal reflexes of Gmc *k and *g in initial position, but not so consistently as to make interpretation easy; still, this makes Campbell conclude that there was a clearly perceptible phonetic difference between their realisations (1959: 173, n.1).

The development of OE <ng> in certain contexts may be relevant, as a similar development to PDE /dʒ/ is attested for OE -ng in some words, like SINGE and CRINGE; <cg> and <gc> are also found in these. Campbell (1959: 174) suggests that it is the same process of palatalisation which affected simplex *k and *g that affected these clusters, including <nk> and <ng>, both medially and finally. Normally, however, the development of OE -ng is to PDE /ŋ/ (though it remains [ŋg] in W Midl dialects), but it is worth noting that there are OE <cg> or <gc> in words with PDE /ŋ/ also (e.g. <þincg>/<þingc> THING, <cynincg>/<cyningc> KING in the *Dictionary of Old English Web Corpus*).¹⁵

¹² Nor does Modern German, in some accounts (Kohler 1990), but this is a contentious claim.

¹³ Searches for these spellings in *The Dictionary of Old English Web Corpus* produce the following results (not counting cases where the clusters straddle a word (or morpheme) boundary): <gc> 24 hits (21 in OE <cg> words, 1 in OE *styce* ‘bit, piece’, 1 in OE *grēting* ‘greeting’ and 1 in OE *tyrning* ‘turning around’); <gcg> 30 hits (24 in OE <cg> words, 1 in OE *sprengan* ‘sprinkle’, 1 in OE *mengan* ‘mix, combine’, 1 in OE *sceawung* ‘spectacle’, 1 in OE *bæcling* ‘backwards’, 2 in a word of uncertain etymology); <ccg> 16 hits (15 in OE <cg> words, 1 in OE *areccan* ‘spread out’); <cgg> 146 hits (142 in OE <cg> words, 4 in words of uncertain etymologies); <ggc> 3 hits (all in OE <cg> words). Numbers for <gc> (2,123 hits) and <cg> (7,967 hits) are too high for all the examples to be examined, but in a high number of instances of <gc>, the consonants straddle word boundaries.

¹⁴ *The Dictionary of Old English Web Corpus* has one <doggena>, two <doggene> and one <doggi-> for DOG. For FROG, it has three <frocca(n)> and five <frogga-> (as well as two <frosc->).

¹⁵ www.doe.utoronto.ca/pages/index.html

Previous scholars may be roughly divided into two groups, i.e. those who think OE <cg> corresponded to [dʒ] from an early stage, and those who think an affricate was a later development. To the first group belong Sievers (1895 [1968]), Hempl (1899), Campbell (1959), Weřna (1988), Hogg (1992) and Lass (1994). To the other group belong Sweet (1888), Luick (1914–40), Wright & Wright (1925, 1928) and Moulton (1954). Some of their arguments are worth considering in detail.

Sievers (1968: 143–55) thinks that the palatal and velar geminates originally were plosives; the velar geminate was found in words like *dogga* DOG, and the palatal geminate <cg> [ʃʃ] developed into [dʒ], which stage was reached in OE. The reason why Sievers postulates such an early date for [dʒ] is found in early OE spellings for words like *fetian*, *ortgeard* and *midgern*, which originally had [tʃj] and [dʃj], but which are occasionally spelt <cc(e)> and <cg>, respectively: ‘The palatal stops *ċ* and (*c*)*ġ* became at a rather early period palatal fricatives,¹⁶ that is, sounds like Eng. **ch** and **dg**. This is shown by forms like **orceard**, **fecccean** ..., **micgern**’ (1968: 146). On Sievers’ interpretation, <cg> is thus a back spelling in these words. As the segments in *ortgeard*, *midgern* always had a (post-)alveolar first element, the reasoning is that <cc> and <cg> must have corresponded to [tʃ] and [dʒ] in *all* words in which the digraphs were used, after the appearance of the back spellings *c.* 900, with the exception of DOG and FROG words, whose spellings are sometimes <docge> and <frocge>. This is a *non sequitur* to which I will return. No intermediate stages are suggested: thus, [ʃʃ] > [dʒ]. Sievers’ textbook was published in 1895, so he may well have been the first to suggest that <cg> must correspond to [dʒ] even in OE, and the evidence for this claim is found in the occasional OE <cc(e)> and <cg> for etymological <tʃg> and <dʃg>.

Even though the other scholars in this group may disagree over details, they agree with Sievers that the occasional OE <cc(e)> and <cg> in *orchard*, *midgern* entail the existence of OE affricates, and most of them believe the geminates were originally stops, before they affricated and assibilated between the seventh and ninth centuries (so Hempl 1899; Campbell 1959; Weřna 1888; Hogg 1992). Lass (1994), however, assumes that the geminates were fricatives; thus, [ʃʃ] > [ʃʃ] > [ddʒ] is the suggested development in the words in question, although this oddly involves the development of a velar *fricative* [ʃʃ] into a palatal *plosive* [ʃʃ].

As for the details, Hempl (1899: 375–83) indicates stages by which what we would now call distinctive features are changed one at a time, in a sequence of changes: velar stop [g] > palatal stop [ʃ] > palatal affricate [ʃj] > palatoalveolar affricate [dʒ]. Campbell (1959: 176) outlines the development [g] > [ʃ] > [d] > [dʒ]. He thinks the reflexes of Pre-OE **g* and **k* merged, at the *d*_ī and *t*_ī stage, with the reflexes of [dʃj] and [tʃj] in **midgern*, *fetian*, *ortgeard*. Weřna (1986) suggests that the phoneme was /dʒdʒ/, but seems to say (1986: 759) that the realisation was probably

¹⁶ The original (third) edition of Sievers’ text (which Cook is translating from) uses the term ‘Affricaten’, so it is clear that Sievers means affricates, not fricatives.

[ddʒ]/[d:ʒ] (as it is difficult to pronounce two affricates, [dʒdʒ], in a row, and [d:ʒ] is the pronunciation of geminate affricates in other languages). This was simplified to [dʒ] word-finally and medially after [n], but /dʒdʒ/ was retained intervocally (1986: 761). Hogg (1992: §§7.2–7.3, 7.15–7.43) suggests the following paths for Pre-OE *g, as a singleton and as a geminate:¹⁷ */ɣ/ [g] > [j] > [dʒ]; */ɣɣ/ [gg] > [ʃʃ] > [ddʒ]. He seems to say that e.g. <licgan> *lie* had [j] in OE, i.e. a palatalised velar stop rather than a fricative or affricate (1992: §7.15 and fn. 3, §7.17 (3)), but it is not explicitly stated. As Lass (1994: 53–9) assumes a fricative [ɣ] in geminates in OE, and thinks palatalisation and affrication and assibilation happened before [ɣ] > [g], the input to palatalisation of OE /g/ was [ɣ], which avoids one or two stages in the development of the voiced velar, because [ɣ] goes straight to [j]. Hence, MIDGE had the development */muɣja/ > [muɣja] > [muʃja] > [muddʒja] > [myddʒja] > [myddʒ].

In the other group, Sweet (1888: §§737, 744, 927) seems to think palatalised *k had the value [çç]¹⁸ in OE and early ME, since <tch> spellings appear only sporadically, even in late ME.¹⁹ Sweet further believes the digraph <cg> had the value [ʃʃ] in OE and eME (cf. Moulton 1954), and the present value [dʒ] (and [tʃ]) was not reached until ‘the First Modern Period’, i.e. 1500–1600, as shown by forms with <d> and <t>. Words like *nature*, *verdure* provide a parallel, since they had ME [tj, dj], but in these it developed to [tʃ, dʒ]. Sweet interestingly finds a parallel for this in [sj] > [ʃʃ], but he does not refer to the identical earlier development of [tj, dj] in e.g. OE *fetian*, *midgern* to [tʃ, dʒ]. Sweet’s suggested development is [gg] > [ʃʃ] > [dʒ].

Luick (1914–40: §§631–3, 637, 640–5, 685–7, 690, 696), like Lass (1994), assumes [ɣɣ] > [gg] in geminates, but he thinks *j was hardened to [gj] in emphatic styles, and that palatalised *g became the same sound. The development was thus [g] > [gj] > [dj] > [dʒ], and the last stage took place in early ME. Due to paradigmatic variation and ON influence, Luick believes ME had both the velar stops and the palatalised/affricated consonant; ME <cg> is, however, deemed ambiguous, and Luick interestingly observes that <cg> words are made to rhyme with one another only in ME (1914–40: §690, Anm. 3).²⁰ This fact suggests that <cg> corresponded to a consonant or consonant cluster unlike any other.

¹⁷ Hogg believes Pre-OE */ɣ/ was [g(:)] initially, in geminates and after nasals (1992: §§7.2–7.3). He assumes that in the geminates */xx kk gg/, the cluster was ambisyllabic. ‘Therefore it has to be assumed that it is the second element which palatalized and that the first element assimilated to the second’ (1992: §7.17 (3)), i.e. regressive assimilation in at least two stages.

¹⁸ Not [tj], as Penzl (1947/1969: 102) infers.

¹⁹ Jordan (1925: §§192) states that <dg> is rare before the fifteenth century (cf. Wyld 1914: §153 (3)), but does not provide examples. *A Linguistic Atlas of Late Mediaeval English (LALME)*, vol. IV, p. 320b, lists 15 LPs containing <tch>, nearly all from Norfolk or Suffolk; this list may be defective, as *eLALME* offers a few more <tch> scattered across the country, but the main point to be made here is that they are infrequent even in late ME.

²⁰ But Luick believes Chaucer’s rhyme *brigge* : *Cantebrigge* indicates [dʒ], whereas *big* ‘large’ : *rig* ‘ridge, back’ in *Havelok* (E Midl), and *leggis* : *seggis* in MS Laud 595 (W Midl) indicate [g] (1914–40: §690, Anm. 3).

Table 3. *The development of palatalised *gg according to the textbooks*

	WGmc	Anglo-Frisian	Pre-OE	OE	IOE	eME	IME	eModE
Sweet	gg	ʃ						dʒ
Sievers	gg	ʃ		dʒ				
Hempl	gg	ʃ(j)	ʃj > dʒ					
Luick	gg	ʃ	ʃj	dj		dʒ		
Wright	gg		ʃ	ʃ	dʒ	dʒ		
Jordan	gg			?ʃ	dʒ			
Campbell	gg	ʃ	ɖ	dʒ				
Wetna				dʒdʒ	ddʒ			
Hogg	gg	ʃ		ddʒ				
Lass	ʃʃ	ʃ	ddʒ					

Wright & Wright (1925, 1928) note that ‘there is no definite proof that’ the ‘sound-change [to /dʒ/] took place in OE’ (1925: 167); moreover, ‘Medial and final **cg** was a palatal explosive nearly like the **g** in N.E. **get**’ (1925: 10). They do not think the back spelling <cc(e)> in words of the *fetian*, *ortgeard* type is sufficient evidence that [tʃ] was reached in OE (1982: 163), but they believe the affricate developed in late OE or early ME (1928: 13–14, 127–8).

Table 3 summarises previous claims regarding the nature and development of the sound corresponding to OE <cg>. Most of the OE grammars agree with Sievers (1895) that the development of [dʒ] was very early; the exceptions are Sweet (1888), Luick (1914–40) and Wright & Wright (1928), who believe [dʒ] was reached at some point between early ME and 1600.

Minkova (2003, 2016, 2019) examines metrical and alliterative OE and ME data to determine the development of the Pre-OE velars in the history of English. She hypothesises that neither /ʃ/ nor /tʃ/ were phonemes until after *c.* 1000 (2003: 71, 110), whereas the status of /dʒ/ or [dʒ] remains uncertain (2003: 134). However, *phonetic* affricates are indeed assumed for OE, certainly in the *fetian*, *ortgeard* set, and also for palatalised **k* in lenition positions, from the beginning of the ninth century (2003: 111). In her 2014 study, Minkova seems to think that the reflexes of the palatalised geminate **k* and **g* may have been phonetic affricates in OE (2014: 77, 81, 85–6; but she also proposes [c/kʲ] as possible realisations of the palatalised reflex of *k* on pp. 81–2), and it is only in Minkova (2016) that she starts to question their existence, proposing other sequences in addition to [dʒ] and [dʒdʒ] for the voiced geminate, i.e. [ʃj] and [dj] (2016: 49). Later, she states that in OE, ‘whatever <cg> represents phonetically, it is a sequence, or a geminate, not a phonemic singleton’ (2019: 165). That is, Minkova is adamant that the sound sequences which were the reflexes of OE <cg> and palatalised **k*, whatever their nature, remained bisegmental (having the weight of two consonants) far into the ME period, and did not become contour segments, i.e. true phonemic affricates with concomitant reduction of phonetic length and metrical weight, until then (2016: 51). The fact that it is only in late ME that alliterations between words with

presumed initial [tʃ] (e.g. <charite> CHARITY) and words with initial /t/ (e.g. <teche> TEACH) start to appear (2016: 41) corroborates this conclusion.²¹

In other words, what is new in Minkova's model is (1) that there were no *phonemic* affricates in English until the eleventh century (which is in agreement with Luick, and Wright & Wright), and (2) that OE <cg> may not have corresponded to [dʒ], but to e.g. [dj] or [jj]. Additionally, Minkova suggests that incipient affrication occurred first in typical lenition positions, e.g. word-internally in syllable codas, and in onsets of weakly stressed or unstressed syllables (2003: 110–11). I will return to all of these issues, but in the next section, I will examine early ME spelling evidence which may throw some light on these topics.

4 The LAEME material

4.1 Forms extracted

ME spelling evidence has not hitherto been investigated systematically with a view to determining the sound correspondence(s) of OE <cg>. As ME spellings have in fact been used to clarify other points of OE phonology (e.g. the three different correspondences of OE <g>), I believe that such investigation should be undertaken: the ME reflexes of OE <cg> may in fact shed light on the pronunciation of OE <cg>. For the present article, therefore, 1,588 tokens were extracted from the LAEME corpus:²² all spellings for all nouns with OE <cg> (91 tokens), and all spellings for those parts of the OE verbs BYCGAN, LECGAN, LICGAN, SECGAN, HYCGAN, ÐICGAN which had <cg> (1,497 tokens); i.e. all forms in the present paradigm, except the 2sg. and 3sg. indicative, which had palatal singleton <g>, probably [j] (as did the preterite forms). Some of the verbs, e.g. OE BYCGAN, SECGAN and possibly HICGAN, had palatal singleton <g> in the imperative singular (i.e. *byge*, *sege*), but all forms for the imperative singular were extracted, as the rest of the verbs have OE <cg>.²³ Table 4 shows the paradigm for SECGAN, a class III weak verb (Sweet/Davis 1983: §74).

²¹ The same 'evidence' is held against Minkova's hypothesis regarding the late phonemicisation of affricates as is invoked in the OE grammars: the occasional <cc(e)> and <cg> in *fetian*, *ortgeard*, *midgern* (Fulk 2003: 350; see also Laker 2003); these will be dealt with later.

²² The LAEME corpus of tagged texts consists of entire early ME texts, or large extracts of long texts, each word of which has been tagged for lexico-grammatical information; the corpus covers all of England for the period c. 1150–1325. Each scribal text has been given an index number, to which I refer on occasion. See also www.lel.ed.ac.uk/ihd/laeme2/laeme2.html

²³ All 82 tokens for -KNOWLEDGE, OE *læce* 'physician', PARTRIDGE, JUDGE V., JUDGEMENT and EGG V. were collected for comparison. JUDGE, JUDGEMENT, EGG all have <g(g)>, except one form with <hg> for EGG (no. 160, 1275–99, Essex); JUDGE V. is <iug(g)i(e)>; it seems that the final <i> indicates an assibilated <g>. KNOWLEDGE, LÆCE mostly have <ch>, but there is a scattering of forms with <g>, which indicates assibilation/affrication of (French) -g- before a front vowel, i.e. the beginning of lenited [dʒ] rather than etymological [tʃ] in -LEDGE < OE *-læce/-læce*; these are found in no. 118 (1240–50, Cheshire) and no. 295 (early fourteenth century, West Riding, Yorks), though in the latter, Old Norse influence and a velar stop may be in evidence. There are no tokens for OE MICGERN, nor for SINGE and CRINGE, in LAEME.

Table 4. *The paradigm for OE SECGAN 'say'*

SECGAN		Present	Past
Indicative	1 sg.	secge	sǣgde
	2 sg.	sægst	sǣgdest
	3 sg.	sægþ	sǣgde
	1–3 pl.	secgaþ	sǣgdon
Subjunctive	1–3 sg.	secge	sægde
	1–3 pl.	secgen	sægden
Imperative	2 sg.	sæge	–
	2 pl.	secgaþ	–
Participle		secgende	-sǣ(g)d

4.2 *The nouns*

All the 91 tokens for reflexes of OE nouns with <cg>²⁴ have <g(g)>,²⁵ except four (table 5). There is one <secg> for OE *secg* SEDGE in text no. 173 (1200–50, Worcestershire), but the scribe in question (the archaising Tremulous Hand of Worcester) has <g(g)> otherwise. There is one <ech3e> for OE *ecg* EDGE in no. 273 (1225–49, Herefordshire), and two <su3hge> for OE *sucga* in no. 1100 (1275–99, Herefordshire).²⁶ Of these, only <ech3e> may show assibilation and affrication, as <ch> may correspond to [tʃ], and the <3> indicates a voiced segment, hence possibly [dʒ]. In the nouns, <g> for OE <cg> in Northern ME (NME) texts could be from Old Norse (ON) and correspond to [g] (cf. Pak 1973), but as <g(g)> is found throughout the country, it is difficult to argue either way.²⁷

4.3 *The verbs*

Of the 1,497 tokens extracted from *LAEME* for verbs with OE <cg>, 31 per cent do not have a medial or final consonant, but rather <ei> or <ai> (table 6). It is thus very clear that the medial and final consonants had started to vocalise in the earliest ME (c. 1150). However, a retained consonant is also in evidence as late as 1340 (in *LAEME* text no. 291, *The Ayenbyte of Inwyt*, and indeed in *LALME*), and up to the cut-off point for *LAEME* (around 1350), almost 70 per cent of tokens still have a medial or final consonant. Forms which do have a medial consonant have <g(g)>, and there is not a single example of <dg>.

²⁴ Most of the words with <cg> have variant spellings in OE, as stated in the beginning of section 3; OE <cg> is therefore not the unique input, but the fact that the nouns in question all have PDE /dʒ/ at least *post facto* indicates that they belong to one etymological group.

²⁵ As <g> is counted MS <g>, <g> and <3>.

²⁶ Besides, there is one <pertrich> for PARTRIDGE in no. 174 (c. 1300, unlocalised language), but this word comes from OF *pertriz*, *perdriz* < Latin *perdix*, and so it is questionable as evidence for the ME pronunciation of the reflex of OE <cg>. OE *SUCGA/SUGGA* may belong to the same group as *DOG*, *FROG*, i.e. may have had a velar geminate.

²⁷ The different reflexes may only be known from their pronunciation in modern dialects, and paradigmatic alternation needs to be taken into account also; cf. Laker (2007).

Table 5. *LAEME nouns with the reflex of OE <cg>*

Lexeme	Number	Spellings
BRIDGE	20	20 <gg>
EDGE ^a	15	1 <g>, 13 <gg>, 1 <ch>
HEDGE	7	7 <gg>
RIDGE	36	23 <g>, 13 <gg>
SEDGE	4	1 <cg>, 1 <g>, 2 <gg>
OE SECG ‘man, hero, warrior’	1	1 <gg>
OE SUCGA <i>a type of bird</i>	4	2 <gg>, 2 <hg>
OE TYGEBRYCG ‘drawbridge’	1	1 <gg>
WEDGE	1	1 <gg>
OE WICG ‘horse’	2	2 <g>
Total 91 (60 <gg>, 27 <g>, 1 <cg>, 1 <ch>, 2 <hg>)		

^aIncluding all derivatives in *-edged*.

Table 6. *LAEME verbs with the reflex OE <cg>*

VERB FORM	BUY	LAY	LIE	SAY	OTHER	TOTAL	Voc. %
Infinitive	59 (20)	42 (10)	82 (21)	542 (155)	3 (0)	728 (206)	28.3
Imperative	–	8 (4)	10 (7)	224 (109)	–	242 (120)	49.59
Gerund	3 (2)	–	4 (0)	6 (0)	1 (0)	14 (2)	14.29
Pres.ppl.	–	–	8 (1)	4 (2)	–	12 (3)	25.0
Subj.pres.sing.	1 (1)	6 (1)	19 (1)	104 (34)	1 (0)	131 (37)	28.24
Subj.pres.pl.	–	1 (0)	2 (2)	16 (5)	–	19 (7)	36.84
1sg.pres.ind.	1 (0)	1 (0)	6 (0)	136 (47)	2 (0)	146 (47)	32.19
Plural pres.ind.	9 (0)	11 (1)	44 (11)	127 (28)	–	191 (40)	20.94
Polite pl. <i>you</i>	–	–	–	1 (1)	–	1 (1)	100
Noun	6 (1)	1 (0)	–	2 (0)	–	9 (1)	11.11
Adjective	–	2 (0)	–	2 (0)	–	4 (0)	0
Total	79 (24)	72 (16)	175 (43)	1,164 (381)	7 (0)	1,497 (464)	30.99

In table 6, the number of vocalised attestations for each verb part is given in parentheses after the total number of attestations for that part; the column OTHER includes OE *HYCGAN* and *ÞICGAN*. The right-most column shows the percentage of vocalised attestations of the total number of tokens for that verb part. It is clear that the imperative has more vocalised attestations than any other verb part, at almost 50 per cent, to which I will return.

Details regarding each verb are given in the following. For *BUY* and *BUYER*, there are 79 tokens in total, of which 55 have <g(g)> (69.62 per cent), and 24 do not have a medial consonant (30.38 per cent), as indicated in table 7. The infinitive is recorded with more ‘bare’ forms (i.e. many different spellings, each of which lacks the medial consonant(s)) than any other verb part. Analogy with the 3sg. pres. ind. may be responsible for the bare forms for the 3sg. subj. The North and NE Midlands stand out as possible loci of change with regard to vocalisation.

Table 7. *LAEME forms without a medial consonant for BUY and BUYER*

Text no.	Date	County	Part	Spellings
137	1275–99	Cambridgeshire	inf.	1 <bein>
2002	1275–99	Gloucestershire	inf.	1 <beye>
269	1275–1324	Norfolk	inf.	1 <beyn>
179	1275–99	<i>Unlocalised</i>	inf.	1 <bi>
180	1275–99	<i>Unlocalised</i>	inf.	1 <bie>
285	1300–24	Norfolk	inf.	2 <beye>, 1 <byen>
296	1300–50	York	inf.	1 <bii>
298	1300–50	North Riding, Yorks	inf. v.n.	2 <bi>, 2 <bie>, 1 <by>, 3 <bye> 2 <biing>
169	1325–49	Lincolnshire	n.	1 <byer>
295	C14?	West Riding, Yorks	inf. 3sg.ps.sj.	1 <bi>, 2 <bij> 1 <bii>

For *LAY*, there are 72 tokens in total, of which 56 have <g(g)> (77.78 per cent), and 16 do not have a medial consonant (22.22 per cent), as indicated in table 8.²⁸ The infinitive and imperative have most attestations without a medial consonant, although there are such forms also for the 1pl. pres. ind. and the 3sg. pres. subj. The W Midlands stands out as a locus of vocalisation, but the E Midlands and the North are also represented from the latter half of the thirteenth century.

For *LIE*, there are 175 tokens in total, of which 132 have <g(g)> (75.43 per cent), and 43 have no medial consonant (24.57 per cent), as indicated in table 9.²⁹ The infinitive and imperative are again attested with many tokens without a medial consonant, but so is the 3pl. pres. ind. There are a few also for the 3pl. pres. subj., the 3sg. pres. subj. and the present participle. Vocalisation of the consonant had spread earlier to more verb parts for *LICGAN* than for the other verbs in this group, and the E Midlands seems to have been affected earlier than the rest of the country.

In the category *OTHER*, all 7 forms for OE *HYCGAN*, *ÞICGAN* have a medial consonant (100 per cent): 5 have <g(g)>, 2 have <h>, and 1 has <cg>; the texts have been localised to Cheshire, Worcestershire, Hampshire and Norfolk.³⁰

²⁸ There is one form with <gg> for palatal OE <g>, which has not been counted among relevant forms; it is <legett> 3sg.pres.ind. in no. 246 (1250–74, Herefordshire). It may be an analogical formation, the analogy being provided by the 1sg.pres.ind., the present plural, and the infinitive, i.e. the present paradigm; the subject is the indefinite pronoun *me* 'one'. Of the other 14 tokens for the 3sg.pres.ind. of *LAY* in *LAEME*, 13 have a diphthong followed directly by <p>, <ð> or <t>, and 1 has the form <leigeð> (no. 150, 1275–99, Norfolk).

²⁹ There are 2 forms with <gg> for palatalised OE <g>; these have not been counted. They are <liggest> 2sg.pres.ind. in no. 222 (1275–99, mixed language), and <liggeth> 3sg.pres.ind. in no. 285 (1300–24, Norfolk). These may be analogical forms, the analogy being the rest of the present paradigm.

³⁰ There are 2 additional tokens, one for each of the verbs *LODGE* and *DRUDGE*, which have PDE /dʒ/, like the OE <cg> nouns. Both ME forms have a medial consonant; they are recorded in no. 1400 (1275–99, Norfolk) and no. 1800 (1225–49, Worcestershire). The etymologies of the two verbs makes their inclusion questionable: *LODGE* comes from OF *loge*, and *DRUDGE* has an uncertain history. They have therefore been excluded from the analysis.

Table 8. *LAEME tokens without medial consonant for LAY*

Text no.	Date	County	Part	Spellings
64	1200–24	Essex	inf.	1 <leien>
247	1250–74	Herefordshire	imp.	1 <lei>
278	1250–74	Worcestershire	imp.	1 <leie>
280	1250–74	Wiltshire	imp.	1 <leie>
2002	1275–99	Gloucestershire	3sg.pres.subj.	1 <lei>
282	1275–1324	Ely	inf.	1 <lein>, 1 <leye>
1600	1275–1324	Oxfordshire	imp.	1 <leie>
182	c. 1300	Lincolnshire	inf.	2 <leye>
285	1300–24	Norfolk	inf.	1 <leyn>
296	1300–50	York	inf.	2 <lai>
297	1300–50	East Riding, Yorks	inf.	1 <lai>
			1pl.pres.	1 <lai>
298	1300–50	North Riding, Yorks	inf.	1 <lai>

Table 9. *LAEME tokens without a medial consonant for LIE*

Text no.	Date	County	Part	Spellings
149	1154	Peterborough	inf.	1 <lien>
			3pl.pres.	1 <lien>
1200	1175–99	Essex	3pl.pres.	1 <lið>
1300	1175–99	Suffolk	3pl.pres.	1 <lið>, 1 <-lien>
65	1200–24	Essex	3pl.pres.	1 <lið>
246	1250–74	Herefordshire	imp.	1 <lie>
247	1250–74	Herefordshire	inf.	1 <lie>
			3pl.pres.subj.	1 <leie>, 1 <lye>
160	1275–99	Essex	3pl.pres.	1 <lyen>
242	1275–99	<i>Unlocalised</i>	imp.	1
1100	1275–99	Herefordshire	imp.	1 <ly>
2002	1275–99	Gloucestershire	imp.	3
			3pl.pres.	2 <lien>
282	1275–1324	Ely	inf.	1 <lien>, 2 <lye>
159	c. 1300	Lincolnshire	3sg.pres.subj.	1 <ly>
			3pl.pres.	1 <lys>
140	1300–24	Wiltshire	imp.	1 <-lie>
155	1300–24	Norfolk	inf.	1 <lin>
285	1300–24	Norfolk	inf.	3 <lye>, 1 <lyen>
188	1300–50	Durham	inf.	1 <lie>
257	1300–50	West Riding, Yorks	pres.ppl.	1 <liande>
296	1300–50	York	inf.	2 <lie>, 1 <-lie>
297	1300–50	East Riding, Yorks	inf.	2 , 4 <lie>, 1 <-lie>
298	1300–50	North Riding, Yorks	3pl.pres.	1 <lies>, 1 <lyes>

For *SAY*, there are 1,160 tokens in total; they are too numerous for all the spellings without a medial consonant to be included in a table here. There are 779 forms with <g(g)> (including 7 <cg>; 67.16 per cent), and 381 forms without a medial consonant (32.84 per cent); the proportions of verb parts with and without a medial consonant are given in [table 10](#).³¹

There are many intermediate forms, e.g. <saiz̥e> in no. 249 (1250–74, Herefordshire) and <seyz̥e> in no. 282 (1275–1324, Ely), in which there is a medial consonant, but the preceding vowel seems to be diphthongal; these have obviously been counted as having a medial consonant. The intermediate forms indicate the course of change for *SAY*: A glide vowel developed between the vocoid and the palatal consonant corresponding to OE <cg>, or the latter vocalised to *i*. For *SAY*, a high number of attestations have <i> for the stressed vowel; it is possible that this is the result of regressive palatalisation (caused by the palatal consonant).

The material for *SAY* points in the same direction as that for the other verbs: The infinitive and imperative were affected by vocalisation first, followed by the 1sg. pres. ind. In one of the earliest E Midlands text, palatalized forms are in fact more numerous than forms with a retained consonant (no. 1300, 1175–99, Suffolk). The same is true of no. 118 (1225–49, Cheshire), and of Northern texts from 1300–50. This points to the E Midlands being the locus of the development examined here, although the W Midlands is well represented from quite an early date too; however, this may well be a concomitant of the fact that most early texts come from these areas.

In numerous texts, the scribe uses co-variants with and without a medial consonant, so variant pronunciations must have persisted for a long time,³² but it is obvious that complete vocalisation of the medial consonant corresponding to OE <cg> was well under way in the late twelfth century, at least in the eastern part of the country. However, as noted before, a retained medial consonant is attested into late ME (*LALME*).

The infinitive and imperative singular were clearly vocalised early, but as noted, the imperative singular of *bycgan* and *secgan* had a palatalised consonant in OE, and these may have acted as a ‘bridge’ (i.e. an analogical model) in the vocalisation of the imperative singular of the other <cg> verbs. Other forms which were vocalised early are the 3pl. ind. and the 1sg. ind. Obviously, the preterites are believed to have had [j] even in OE; it seems, therefore, that the process that affected the pronunciation of OE <cg> in verbs may have been one involving analogy and paradigmatic levelling rather than sound change as such. This seems also to be the standard position, but I will

³¹ In addition, there is 1 token for ‘unsaying’ in no. 291 (1340, Kent), 1 for ‘unsayingly’ in no. 301 (1175–99, Lincolnshire), and 2 tokens for ‘sayer’, also in no. 291; all 4 have a medial consonant. Thus, there are 1,164 tokens altogether for *SAY* and related words. There is also one form with <gg> for palatalised OE <g>, which has not been included in the count; it is <suggeþ> 3sg.pres.ind. in no. 2002 (1275–99, Gloucestershire).

³² Consider, for instance, no. 249 (Herefordshire, 1250–75), which has 3 tokens for the 1sg. pres. ind.; the spellings are widely different and likely correspond to different pronunciations: <saiz̥e>, <sape>, <sig̥e>.

Table 10. *LAEME forms for SAY*

SAY	Tokens	Vocalised (%)
Infinitive	542	155 (28.6)
Imperative	224	109 (48.66)
Gerund	6	0 (0)
Pres.ppl.	4	2 (50)
Subj.pres.	120	39 (32.5)
1sg.pres.ind.	136	47 (34.56)
Plural pres.ind.	127	28 (22.05)
Polite pl. <i>you</i>	1	1 (100)
Total	1,160	381 (32.84)

Table 11. *Incidence of <g> for OE <cg> in nouns in LAEME*

Text	County	Lexeme, nos.	Text	County	Lexeme, nos.
18	<i>Unlocalised</i>	RIDGE 1	261	Shropshire	RIDGE 1
121	<i>Mixed</i>	RIDGE 1	270	Norfolk	RIDGE 1
122	Cheshire	RIDGE 1	277	Worcestershire	RIDGE 1
160	Essex	RIDGE 1	285	Norfolk	RIDGE 1
173	Worcestershire	EDGE 1, SEDGE 1	286	Berkshire	RIDGE 7
175	Norfolk	RIDGE 1	1000	Shropshire	RIDGE 1
227	<i>Unlocalised</i>	RIDGE 1	1300	Suffolk	WICG 2
246	Herefordshire	RIDGE 3	2002	Gloucestershire	RIDGE 1
248	Herefordshire	RIDGE 1	Total: 27 <g>		

return to this point in section 4.6. It could also be that the set *bycgan*, *licgan*, *lecgan*, *secgan* developed in a parallel fashion, due likely to their similar phonetic make-up, as they belong to different classes (*bycgan* and *lecgan* are weak class 1, *licgan* is strong class 5, and *secgan* is weak class 3); the coherence of the set may be part of the larger picture, somewhat like the PDE spread of *-ung/-unk* in the past tense of verbs whose infinitives end in *-ing/-ink*.³³

At the outset, I assumed that there was no significance in the use of a single <g> vs a double <gg> in the eME texts; <gg> is the dominant spelling by far. However, for the sake of the argument, I have counted occurrences of single <g> separately. Of the nouns, only EDGE, RIDGE, SEDGE and OE WICG have a single <g>, and a single consonant is in fact the dominant form for RIDGE and WICG,³⁴ which both have a close front vowel preceding the consonant. 27 single <g> are attested in East Anglia, Berkshire and the W Midlands (table 11).

³³ I owe this observation to an anonymous reviewer.

³⁴ But there are only two tokens for WICG.

There are a mere 85 single <g> for OE <cg> verbs (out of 1,497 tokens).³⁵ The tokens with a single <g> do not appear to pattern in any systematic way, neither regarding areas nor regarding verb parts; they constitute 5.68 per cent of the extracted verb forms in *LAEME* (excluding three forms with <þ> or <h>), whereas forms with <gg> constitute 94.12 per cent.

4.4 *The Ormmulum*

In this regard, there is one eME text whose author is outstanding, both in having devised his own spelling system and in being exceptionally consistent in its application. This is of course the *Ormmulum*. Orm has a system with three different-shaped g's, all used etymologically.

- (a) Insular g <ǰ> indicates a palatal approximant or fricative [j/ǰ]; the digraph <ǰ^h> seems to correspond to a fricative, perhaps retained OE [ɣ].³⁶
- (b) The flat-topped <g> corresponds to a plosive [g].
- (c) The Caroline <g>, new in vernacular usage, is used *only* and *always* in OE <cg> words.

This strongly indicates a different sound correspondence for the reflex of OE <cg> than for OE <g>, and it does *not* follow that it was [dʒ]: it would be very strange if Orm, whose hearing evidently was acute, had analysed it as [dʒ], but then failed to represent the palatoalveolar, or even more so, the palatal approximant/fricative, for which he regularly writes <ǰ> elsewhere. Orm's consistent <g(g)> for OE <cg> has a set of negative implications, that is, non-[d], non-[g], non-[ɣ], non-[j], and non-[dʒ]; the most economical assumption is that it corresponded to [j],³⁷ but it may also indicate something like [ǰ] or [ʒ]. Orm's spelling does not really allow for a bisegmental analysis of the type [jj], and phonemic length in consonants had by all accounts been lost at this stage anyway, but the reflex of [jjj] could be an exception, and [ff]/[jj]/[ʒʒ] may be intended.³⁸

³⁵ 60 tokens for *SAY* (in addition, there are two tokens with intervocalic single <þ> and one with final single <h>); 1 for *BUYER* (no. 1200, Essex, 1175–99); 2 for *BUY* (no. 228, not localised, 1250–99; no. 2002, Gloucestershire, 1175–99); 2 for *LAY* (no. 4, 1175–99, and no. 64, 1200–24, both Essex); 1 for *HYCGAN* (no. 304, Hampshire, 1200–24); 19 for *LIE*.

³⁶ Orm seems to use <ǰh> and <ǰ^h> contrastively. <ǰ^h> is very common and corresponds to a fricative, possibly [ɣ], as in <hallǰ^he> *HOLY*, <folǰ^henn> *FOLLOW*, <aǰ^henⁿ> *OWN*. <ǰh> is used only in <ǰho> *SHE*, at least in the extract included in the *LAEME Corpus of Tagged Texts*, from which all the examples have been taken (www.lcl.ed.ac.uk/ihd/laeme2/laeme2.html).

³⁷ Surely, someone (like Orm) who is capable of hearing and orthographically representing the difference between [g] and [ɣ] and [j], which were all historically spelt <g>, is also able to hear the difference between [g] and [j] or [j]/[ʒ] and indicate that difference orthographically.

³⁸ However, Minkova (2019: 168) states that the 'pre-affricates' were an intermediate category for Orm, as 'intervocally they are sufficient to render the stressed syllable heavy ... The weight of the stressed syllable ... does not have to be attributed to the presence of a geminate: an assibilated, or a dental-fricative sequence will have the same effect'.

4.5 *LAEME* spellings for Gmc **k* and **g*

For comparison, *LAEME* spellings for simplex palatalised Gmc **k* and **g* have been considered. For palatalised *g*, <g>-type spellings remain dominant in the period 1150–1350, but <y-> starts appearing c. 1200–50. For palatalised *k*, <c>, <k> and <ch> are all frequent, but with clear regional preferences: <k>/<c> are used in the North and NE Midlands, <ch> in the South, West and SE Midlands.

These patterns suggest that spirantisation and/or affrication of simplex Pre-OE **k* is in evidence in (early) ME, but not really in OE, counter to what is claimed in the textbooks, which always assume OE [j] for palatalised **g* and OE [tʃ] for palatalised **k*. In fact, there is no hard evidence for assibilation and affrication until early-ish Middle English, and then only for the voiceless consonant (cf. Wright & Wright 1925: 163); for the voiced palatal geminate *gg*, there is no unambiguous evidence at all for a palatoalveolar affricate until the mid fourteenth century; see section 5.

4.6 *Word class, analogy, paradigmatic levelling and position within the word*

There is no doubt that the two different developments are connected to word-class, in that the nouns have PDE /dʒ/, whereas the verbs have a diphthong corresponding to OE <cg>; the difference is apparent from the earliest ME material. However, this may be no more than a reflection of the fact that the two classes had different phonological environments: the verbs were more susceptible to spread of vocalisation in the first place, because there was paradigmatic alternation between <cg> and palatal <g>, whereas no such paradigmatic variation was found in the nouns.

As for position in the word, it is difficult to draw any certain conclusions, but the following points can be made. In hindsight we know that the infinitive was gradually reduced, starting with the loss of the final *-n*, then of the (now) final unstressed vowel, leaving what had been the medial consonant in final position. It could be that the consonant corresponding to OE <cg> was more susceptible to weakening word-medially, since the infinitive (which had a medial <cg> in OE) was affected by vocalisation very early; all other vocalised verb forms in *LAEME* had a word-medial consonant in OE, except the imperative singular, in which the consonant was word-final, as indeed it was in the nouns. However, word-medial position may be identical to syllable-final position, and Minkova in fact argues that ‘the palatalized velars became affricated first word-internally, where they could appear in coda position, a prototypical position of neutralization’ (2003: 110).

The *LAEME* material shows somewhat diverging tendencies. The infinitive, which had a medial consonant in OE, accounts for 44.3 per cent of all vocalised forms (and 28.3 per cent of all infinitives show vocalisation). The imperative plural, which also had a medial consonant, however, shows the opposite tendency, with retention of the consonant in 94.6 per cent of cases; the imperative singular, in which the consonant was word-final, shows vocalisation in 88.6 per cent of the relevant forms (table 12). The singular is by far the

Table 12. *LAEME tokens for the imperative of LAY, LIE, SAY*

	Vocalised	Medial consonant	Total
SAY			
Imp. sing.	104 (88.89%)	13 (11.11%)	117
Imp. pl.	6 (5.61%)	101 (94.31%)	107
Total SAY			224
LAY			
Imp. sing.	4 (100%)	0 (0%)	4
Imp. pl.	0 (0%)	4 (100%)	4
Total LAY			8
LIE			
Imp. sing.	8 (80%)	2 (20%)	10
Imp. pl.	–	–	–
Total LIE			10
Total all verbs			242

more frequent, which entails that on average, 49.6 per cent of all imperatives show vocalisation.

It seems rather obvious that analogy played a role for the first-person singular present indicative, which may have vocalised by analogy with the rest of the singular paradigm; so also for the singular present subjunctive, which may have vocalised by analogy with the indicative. Early vocalised forms for the plural present indicative and plural subjunctive are more difficult to explain, but the analogy could have been through the 1sg > 1pl > 2/3pl, although such a scenario remains speculative.

Maiwald (2017), who examines the vocalisation of the semivowels [j] and [w] and the voiced velar fricative [ɣ] in ME, concludes that the input consonant is ‘the most potent predictor for the sound change’ (2017: 316), in that words with the reflexes of [j] show the highest frequency of vocalised spellings, whereas words with the reflexes of [ɣ] show the lowest frequency of such forms. The other variables predicting vocalised spellings are (in decreasing order of importance): syllabicity (tautosyllabic semivowels show much higher frequencies of vocalised spellings), time (vocalised spellings increase in frequency over time), the quality of the preceding vowel (front monophthongs induce vocalisation of the following semi-vowel), dialect and word class (2017: 316). Regarding word class, Maiwald finds that adjectives and adverbs have higher numbers of vocalised spellings than nouns, lexical verbs and quantifiers (2017: 269–70), and that nouns and lexical verbs alike show a steady increase in vocalised spellings in the course of eME (2017: 281). Maiwald also notes that ‘Verbs do not seem to show much of an increase of *VOCALIC* spelling proportions with lexel frequency’ (2017: 276).³⁹ Finally, he finds that open-class lexical items led the change

³⁹ Maiwald states earlier that there seems to be a ‘positive correlation between FREQUENCY and “vocality”’ (2017: 261), in that there is a higher proportion of vocalic spellings for more frequent items, but he concludes that frequency has a ‘rather weak overall effect’ (2017: 265).

(vocalisation), but that closed-class items ‘seem to have adopted the new spellings at a faster rate’ (2017: 278). Variables which seem not to have affected vocalisation to any great degree are lexeme frequency, the quantity of the preceding vowel and stress (2017: 317–18). For our purposes, Maiwald’s most important finding is that tautosyllabicity is a highly significant predictor of vocalisation; besides, his observations that time and dialect correlate with vocalisation, whereas lexeme frequency does not, give some support to the findings reported here. In other words, we both find that spellings indicative of vocalisation increase in frequency with time, and that parts of the E Midlands and W Midlands led the vocalisation examined here.

4.7 *The LAEME evidence: summary*

We are now in a position to answer, at least tentatively, the four questions posed in the introductory section. (1) Are the ME spellings consistent enough, lexically and diachronically, or in individual texts, for any patterns to be detected? Yes, but in a negative way: eME spellings are very consistent, but it is the complete absence of <d-> spellings for words with OE <cg> (and the absence of <t-> forms for words with palatalised *k) which is most striking. (2) Is it possible to establish the likely OE and ME sound correspondences of <cg>? The orthographic evidence afforded by the *Orrmulum* precludes an affricate, as does the bulk of eME spellings, but this question will be answered in full in sections 5 and 6. (3) Had the diverging developments of nouns and verbs with OE <cg> started in the period investigated? The diverging developments had certainly started by 1150, and may even have started in OE, but the process was not complete by 1350, which suggests that variant pronunciations persisted for a long time. (4) To what extent did the sound development of OE <cg> depend on word class, position within the word, analogy and paradigmatic levelling? It is obvious that the differential treatments of the reflexes of OE <cg> partly depended on the position of the sound in the word: the word-final consonant in the singular of nouns constituted the coda of a stressed syllable⁴⁰ and was thus prevented from being vocalised and deleted, whereas the consonant was primarily found in word-medial (but syllable-final) position in the verbs and was more vulnerable to weakening and loss; this process was aided by the fact that <cg> in verbs alternated with palatalised g [j], which generally vocalised in other vocabulary as well.⁴¹ The importance of analogy with such forms cannot be overstated for the verbs.

What is most striking about the *LAEME* data is the unusual and complete agreement among the scribes as to the spelling of the reflex of OE <cg>: they all use <g(g)> in

⁴⁰ Plurals and genitives are a problem to this hypothesis, but non-tautosyllabicity vs tautosyllabicity could play a role here. Maiwald finds that a distinction between ambisyllabic and heterosyllabic semivowels is unnecessary to explain their vocalisation; the crucial distinction is between tautosyllabic and non-tautosyllabic semivowels (2017: 217, 219–24, 317).

⁴¹ Maiwald (2017) finds that the semivowels vocalised to a much greater extent when they were tautosyllabic with the preceding vowel, but he examines the semivowels and the voiced velar fricative, not primarily the reflex of OE <cg>.

those cases where a consonant (letter) is retained, for nouns and verbs alike. Consequently, there are no regional patterns either, which again is rare for early ME. It implies (a) that all the scribes thought that the letter <g> provided the best fit for the realisation of the reflex of OE <cg>, and possibly (b) that this realisation, whatever its exact nature, may have been relatively uniform across the country (with the caveat that <g> in the nouns in NME could show ON [g]). The existence of regional (allophonic) variation cannot be ruled out; all that is certain is that the ME spellings do not reflect such variation, unlike what is the case for the reflexes of palatalised singleton *k and *g.

5 The likely sound correspondence of OE <cg>

So far, we have primarily considered earlier accounts of the sound value of OE <cg>, and we have seen that there is no direct evidence for the terminal stage [dʒ] in OE and ME. I do not believe that OE <cg> was [dʒ], for the following five reasons.

1. OE words like *frogga* FROG and *dogga* DOG are also sometimes spelt with <cg> in OE (Luick 1914–40: §631; Campbell 1959: 27; *Dictionary of Old English Web Corpus*, see section 3, footnotes 13 and 14), yet these are always claimed to have a velar plosive [g:] in OE, and still do in PDE. Similarly, there are a fair number of minor spellings, e.g. <cgc>, <ccg>, <gcg>, mostly in OE <cg> words, but also for the final consonant of OE *-ing* and *-ung*, for which PDE has /ŋ/ (WMidl /ŋg/). This fact does not make sense if <cg> corresponded to OE [dʒ], but it makes sense if <cg> corresponded to a geminate plosive or a cluster containing a plosive.
2. The argument that <cc(e)> and <cg> must be [tʃ] and [dʒ] because earlier <t#g> and <d#g> are sometimes spelt <cc(e)> and <cg> is a non sequitur; they are rather attempts on the scribes' part to give orthophonic spellings for the new sounds [tʃ]/[tʃ] and [dʒ]/[dʒ] in *ortgeard*, *fecc(e)an*, *micgern*, developed from [tʃ] and [dʒ] across syllable and/or morpheme boundaries as a result of what is called 'YOD Coalescence' in the modern language (Wells 1982: 330–1); but it does not follow that <cc(e)> and <cg> must be [tʃ] and [dʒ] always (cf. Wright & Wright 1982: 163). True back spellings are bidirectional, but that is not the case with <cc(e)> and <cg>: earlier <t#g> and <d#g> are *sometimes* spelt <cc(e)> and <cg>, respectively, but etymological <cc(e)> and <cg> are *never* spelt <tg> and <dg> in OE. In fact, <cg> in *micgern* may equally indicate assimilation from [d+j] to [ʃ+j] as a (post-)alveolar affricate; thus, if OE <cg> is [ʃj], as argued below, the occasional <micgern> makes perfect sense. Besides, syllable-initial consonant clusters may develop across morpheme boundaries although the same cluster is not found word-initially.⁴² A consonant cluster straddling a morpheme/syllable boundary is not of itself evidence that the same cluster occurs in free position. In essence, it means that the *ortgeard*, *midgern* words may have developed phonetic affricates, which could equally have been [tʃ] and [dʒ] as [tʃ] and [dʒ], and that the closest spellings in the established

⁴² I owe this argument to Michael Benskin (pers.comm.).

orthography, given the limitations of the Roman alphabet, were <cc(e)> and <cg>. It does not follow that the palatalised reflexes of WGmc *k and *g had reached the assibilated stage in OE, although it cannot be stated with absolute certainty that assibilation was *not* present in OE either; all that is certain is that the realisation of OE <cg> was not a singleton, but rather bisegmental, and that the first element was likely not dentalveolar.

3. If <cg> is indeed evidence of some kind of affricate, it need not be a palatoalveolar one, merely a palatal one, and affrication need not entail assibilation.
4. Unambiguous spelling evidence for palatoalveolar affricates, i.e. <tch> and <dg>, is very late. The online *MED* (*sub verbis*)⁴³ reports the following <dg> and a few other irregular spellings for OE <cg> words, the first of which does not appear until 1387 (table 13).
5. It is likely that the developments of the voiced and voiceless sounds were not parallel, either in terms of dates, or of the phonetic stages involved: given the Gmc absence of phonemic voiced fricatives in the early stages of the daughter languages, it is only to be expected that voiced fricatives and affricates should develop later than their voiceless counterparts; see the first paragraph of section 3. Thus, evidence for [tʃ] need not entail [dʒ].

To determine the likely sound correspondence of OE <cg>, it is worth asking whether OE <cg> always corresponded to the same sound, given the diverging developments in nouns and verbs. Identity of sound in OE is indeed indicated by the scribes' choice of the same spelling for both parts of speech; etymology supports their analysis, as the words in question all stem from Gmc *gʃ. The next question then is which development 'continues' the OE sound, the nouns or the verbs? The answer must be that the nouns do, as the ME vocalisation of OE <cg> in verbs seems to be the result of analogy rather than of a sound change *per se* (though sound change cannot be ruled out): palatal <g> vocalises elsewhere too, e.g. in OE <weg> WAY and <dæg> DAY (cf. late OE *dæi*), and when it vocalised in those principal parts of OE <cg> verbs which had palatal <g> (generally those of the preterite paradigm), the non-palatal forms may also have developed variant forms with a vocalised consonant. As there is agreement (supported by the later developments) that OE <c> corresponded to [k] or [tʃ/ç], and OE <g> corresponded to [g] or [j] or [ɣ], depending on the phonetic context, the key to identifying the sound correspondence of OE <cg> lies in just these allophones.

My simple suggestion is that OE <cg> was pronounced [ʃ(j)j],⁴⁴ that is, that Gmc *[ʃj] either was unchanged in (Pr)OE, or that the second element of the geminate later lenited to an approximant; this differs a little from Minkova's [ʃj] (2016: 49; 2019: 164, example

⁴³ The abbreviations for texts are those used by the online *MED*: <https://quod.lib.umich.edu/m/middle-english-dictionary>.

⁴⁴ OE seems not to admit a cluster consisting of a tautosyllabic geminate+consonant, so [ʃj] may not have persisted, but since the WGmc [j] causing gemination and palatalisation was not syllable-final, it could be that [j] remained as the onset of the second syllable, i.e. the cluster was [ʃj+j] rather than [ʃjj]. The cognates in NGmc appear as e.g. *bryggja* 'pier' (cognate with BRIDGE), *liggja* LIE, *leggja* LAY.

Table 13. <dg> and other irregular forms for OE <cg> words in the online MED

Lexeme	Date	Form	Source
BRIDGE	1387	brydge	Trev. Higd.(StJ-C H.1), 5.123
	1450	brydge	Treat.Fish.(Yale 171), 17
	1480–81	Bridge	*CLRO MS Bridge House Rental 3, f. 333b
EDGE	1442	edges	Invent.Gild in PSAL ser.2.5, 123
HEDGE	1417	hedge	Doc.in Sur.Soc.85, 12
	1440	hedgyn, hedge	PParv.(Hrl 221), 232
	1440	hedgydde	PParv.(Hrl 221), 494
	1450	hedgewoods	Chron.Repton, 70
	1450	hedgyng	Alph.Tales (Add 25719), 27/14
	1475	hedgys	Doc.in Bk.Brome (Brm), 138
	1500 (1410)	Hedgid	Lydg. CB (Lnsd 699), 49
	1500 (1340)	mydge (x2)	Rolle Psalter (UC 64), 104.29
MIDGE	1382	rigje	WBible(1) (Bod 959), 2 Kings 1.7
	1445–6	Ridbandis	Acc.R.Dur.in Sur.Soc.99, 86
RIDGE	1470	rydge	Malory Wks.(Win-C), 197/7
	1271	Sechewyk	EPNSoc.6 (Sus.), 232
	1399	slechis	Mem.Ripon in Sur.Soc.81, 132
SEDGE	1440	Wedge (x2), wedge	PParv.(Hrl 221), 520
	1448–9	wedgez	Acc.R.Dur.in Sur.Soc.99, 237

(9)). In the OE spelling system, <g> may unproblematically correspond to [j], and to indicate the different manner of articulation of the two segments, i.e. plosive vs approximant, <c> was used for [j], as a plosive diacritic. The reason is partly that the Roman alphabet had only two letters for (historically) velar sounds of any kind, <c> and <g>, and <gg> more logically corresponded to a geminate velar plosive [g:] in words like *frogga* FROG than to a cluster [j(j)], even if both <cg> and <gg> are used quite frequently in OE for both palatal and velar plosive geminates. My suggested pronunciation [j(j)] agrees not only with the more certain phonetic realisations of Gmc **gj* in the other early Gmc languages, which all have [qj] or [jj], but also with the overwhelming body of spelling evidence for both OE and ME, as well as with the later reflexes of the sound in question. It was noted earlier that OE <cg> alternates with palatalised <g> in the verbal paradigms: It makes sense to have [j] (palatalised singleton) alternate with [jj] (palatalised geminate), but not with [dʒ], for reasons of phonetic similarity in two reflexes of what is etymologically the same sound; and it makes sense for this [jj], not [dʒ], to have become [j] in ME, whether by analogy with the preterite and other palatalised forms, or by a real sound change, i.e. true vocalisation of the kind [jj] > [jj] > [j] > [i].

The other spellings for <cg> words in OE also make more sense if OE <cg> corresponded to [j(j)]. <gg> is in fact the earliest spelling for <cg> words (seventh century), but seems to have been ‘reallocated’ to [g:], which is logical, given the rationale behind alphabetic writing: a geminate sound should be represented by a

geminated letter. It could also be that the phonetic similarity between a velar and a palatal plosive sometimes made scribes use <gg> for both velar and palatal geminates without distinction – after all, the simplex velar and palatalised reflexes of Gmc **k* were clearly perceived as allophones for a very long time, given that they alliterate even in ME (Minkova 2016: 40).⁴⁵ When <cg> started to be used for [ʃ(j)] a little later (eighth century), this may have been an attempt to reflect the difference between a palatal and a velar sound orthographically. Thus, <docga> could simply be a back spelling with the following rationale: If <gg> may be used for both [g:] and [ʃ:(j)], then <cg> for [ʃ:(j)] may be extended to the velar geminate also. Finally, if it is allowed that the <c> in the <cg> cluster represents [ʃ], a spelling like <cynineg> or <cyningc>⁴⁶ KING also makes sense: The last <c> simply corresponds to a sound which is both a plosive and palato-velar, i.e. [ʃ], after a palato-velar nasal, i.e. [ɲʃ].

6 From OE [ʃ(j)] to late ME /dʒ/

It is common for clusters like [cj] and [ʃj] to coalesce or be dissimilated.⁴⁷ Coalescent assimilation is observed in the NGmc palatal reflexes of Gmc **k* and **g*, as indicated in (3) for Norwegian. Swedish and Danish went through exactly the same process, but in Danish, the process has been reversed (Sandøy 1991: 183; Papazian & Helleland 2005: 53).

- (3) ON *gj* > [ʃj] > /j/ (*gjøre* ‘to do’, *geit* ‘goat’ with /j-/)
 ON *kj* > [cj] > /ç/ (*kjerne* ‘kernel, core’, *kinn* ‘cheek’ with /ç-/)⁴⁸

In a process of dissimilation, the first element would become post-alveolar ([ʃj] > [dʒ]), after which the second element would also become post-alveolar, in a process of assimilation ([dʒ] > [dʒ]). Such a process is attested in Romance, in which [dʒ] had developed already in Gallo-Roman (fifth–ninth centuries) from Latin *g* and *j*, and was simplified to [ʒ] in OFr in the thirteenth century, but remains in Italian (Pope 1934: §§191–5, 291–2).⁴⁹ However, it seems as if the value [dʒ] was kept in early French loans in English, certainly in initial position in which the reflexes still have /dʒ/, whereas [ʒ] is found in later loans in medial and final positions. What is clear is that the sound

⁴⁵ Minkova (2016: 40) adduces *clene Cudberte : cildhade* in a text dated to c. 1100, and *chiden : cnihtes; child : Claudiene; childes : quene* from *Layamon’s Brut* (from the earlier manuscript Cotton Caligula A IX (C), ‘dated between 1189 and the first half of the thirteenth century’ (2016: 50, fn. 48). Of course, this need not concern <cg>, which is not found in initial position.

⁴⁶ The *Dictionary of Old English Web Corpus* has 164 attestations of <cynineg> and 190 of <cyningc>.

⁴⁷ The reason may be that the two sounds are too similar to be retained as functionally separate sounds, cf. Guion (1998). Similar processes are observed in PDE, i.e. YOD Coalescence, in which /tj/ and /dj/ frequently become [tʃ] and [dʒ], both in syllable-initial position, as in *Tuesday*, *due*, and across word boundaries, as in *hit you*, *did you* (Wells 1982: 330–1).

⁴⁸ In fact, some dialects of Norwegian have [(t)j/tʃ] for the reflex of palatalised Gmc **k*, and some have [(d)dʒ] for the reflex of palatalised **g* (Thorson 1973: 337; Papazian & Helleland 2005: 53); see also footnote 6.

⁴⁹ Similar though not identical cases of dissimilation are found in certain South-Western dialects of Norwegian, in which <l> becomes [dl] and then in some cases [dd]; e.g. *alle* ALL > *adle* (> *adde*), cf. Haugen (1976: 274).

corresponding to OE <cg> fell in with this French [dʒ] in later ME, so even if OE <cg> was *not* [dʒ] in OE or early ME, it had become similar enough to merge with it later. It is even possible that the realisation of the reflex of OE <cg> was affected by French [dʒ]: The realisation of the reflex of OE <cg> was similar enough – perhaps [dj]/[dʒ] by this stage – to French [dʒ] to merge with it, giving /dʒ/. The development of OE *micgern*, *singe* and of PDE /dj/ > /dʒ/ (as in *due*, *did you*) shows, however, that the last stage [dj] > [dʒ] may certainly also be an entirely native development. Minkova (2019) proposes an even closer link between the development of the affricates in English and French loans: The fact that [tʃ]/[dʒ] and [ʃ]/[ʒ] (both singletons) alternated in French may have provided ‘a structural parallel for the perception of the same native CC-sequences as singletons’ (2019: 176).

In the larger picture, the development sketched out in the preceding entailed that /dʒ/ became a phoneme: it was no longer phonotactically restricted to initial position (French loans), but was now permitted in medial and final positions also.⁵⁰ A relevant (inverse) parallel is seen in the fricatives, for which it is generally accepted that OE had voiced allophones in medial position, although they are not orthographically distinguished; these voiced fricative allophones were not phonemicised until ME, when French loans brought new words into the English vocabulary in which voiced fricatives were found in initial and final positions also.⁵¹ With the phonemicisation of voiced fricatives, and finally of /dʒ/, the consonant inventory of English had become symmetrical, in that the voiced-voiceless opposition found in the plosives was now also fully operative in the system of fricatives, with the exception of /h/.⁵²

As for the date at which the terminal stage [dʒ] was reached, the element [d] must be late; otherwise, it is difficult to account for the two facts that (a) all eME scribes, including Orm, agree on <g(g)>, and (b) there is not a single <d> in sight until *c.* 1340, which is astonishing, especially for ME, even considering the power of spelling tradition. As we saw in section 3, previous scholarship has suggested different paths of development for the pre-affricates. In my opinion, the most likely path is given in (4a), and is based on OE and ME spellings and sound correspondences, as well as on knowledge of such processes cross-linguistically. (4b) is given to account for Orm’s spellings. (4a) probably describes the simplest and most economical path of development from OE [ʃ(j)] to late ME [dʒ].

- (4) (a) [ʃj] > [ʃ] > [dj]/[dʒ] > [dʒ] OR
 (b) [ʃj] > [ʃ] > [ʃʃ] > [ʒʒ] > [dʒ]

Typological arguments should be used with caution, as they are descriptive and not explanatory, but it might be noted even so that whereas phonemically opposed bilabial,

⁵⁰ This statement is purely descriptive: it is perfectly possible for phonemes to be phonotactically restricted and still be phonemes; PDE /ʒ/ is a case in point.

⁵¹ Besides, initial fricatives were voiced in SW and SE dialects in ME (Wright & Wright 1928: §236), the result of which is only occasionally seen in the standard language, e.g. *vixen*, *vat*. The consequences of this native development for the phonemicisation of voiced fricatives are uncertain and not directly relevant here.

⁵² This is merely a statement of fact; I do not believe that phoneme systems need to be symmetrical.

alveolar and velar plosives are very common indeed, palatal plosives are rarer (Maddieson 1984: 32–3; Schmid 2011: 1762).⁵³ The reason could be that a palatal plosive would have similar acoustic and perceptual properties to both alveolar and velar plosives (cf. Minkova 2016: 40, and references cited there), as their places of articulation are very close. Thus, a (pre-)palatal plosive may simply be reinterpreted as a (palato)alveolar plosive. In the case in question and as an alternative to a native development [ʃj] > [dʒ], it means that [ʃj] may have been reinterpreted or heard as [dʒ], which was sufficiently similar – as observed in hindsight – to fall in with [dʒ] in words of French origin. However, such a scenario hingeing on perceptual similarity and re-interpretation is hardly necessary to account for the development of OE <cg>, as the articulatory route suggested in (4a) is perfectly adequate.

There are, however, a few analogical spellings in eME texts which may suggest that the affricate stage had been reached around 1250, as argued by Lass & Laing (2013); their argument is worth detailed consideration, as it has consequences for what kinds of spellings we admit as ‘evidence’ for [dʒ]. Lass & Laing state that ‘Caroline “g” in Middle English is characteristically used for [g] or [dʒ] (usually non-initial) while surviving insular “ȝ” and its later development “ȝ” are deployed for [j] and dorsal fricatives’ (2013: 103). This statement appears not to hinge on the spelling system of Orm, who uses the Caroline <g> only and always for the reflex of OE <cg>, since they claim that ‘Any “g” in LAEME ... not combined in a “gh” cluster most characteristically represents a stop, with its next most common use being for [dʒ]’ (2013: 103). Hence, it is clear that the authors believe Caroline <g> *by itself* may correspond to [dʒ] in early ME. Their most compelling evidence is found in the work of two early ME scribes, in the form of occasional spellings <ig/yg> for ‘I’, which are *not* taken as back spellings for [i:] in ME. The argument is that a few early ME texts have spellings which indicate devoicing of etymologically voiced stops, which leads to e.g. <t> for etymological [d], and <c> for [g]; it also leads to back spellings <d> for [t] and <g> for [k]. This is the case in one of the two texts (no. 246, Hrf, 1250–75),⁵⁴ and so <ig> may be for [ik] in the language of this scribe (2013: 109). The other text (no. 263, Wlt, 1275–1300),⁵⁵ on the other hand, has no <c> or <k> for [g] (i.e. no devoicing), but does have <g> for [k] (e.g. <þenge> THINK).⁵⁶ As devoicing is not in

⁵³ Palatal plosives are found in 18.6% of the languages examined by Maddieson, whereas bilabial, dentalveolar and velar stops are found in, respectively, 99.1%, 99.7% and 99.4% of the languages of the world (Maddieson 1984: 32). In terms of sizes of stop systems by place, the majority of languages have three (53.9%) or four (32.5%) distinct places of articulation (1984: 31); if affricates are included, most languages make use of four (43.8%) or five (27.4%) distinct places of articulation for stops (1984: 34). That is, languages with a four-way system tend to have bilabial, dentalveolar and velar plosives, and palato-alveolar affricates. Moreover, 58 out of the 59 languages found to have palatal stops have four or more phonemically distinct places of articulation for stops; in other words, if a language has phonemically opposed palatal stops, it also has bilabial, dentalveolar and velar stops (1984: 33). Maddieson suggests that the three near-universal places bilabial, dentalveolar and velar are so common because they make use of three well-distinguished articulators – the lips, tongue tip or blade, and tongue body (1984: 32).

⁵⁴ Cambridge, Trinity College B.14.39 (323), Hand A.

⁵⁵ London, British Library, Royal 2.F.viii, fol. 1v.

⁵⁶ LALME IV 321b shows numerous <ng> for <nk>, and <nk> for <ng>.

evidence, the rationale for the back spellings is absent, and it is thus less likely that <ig>/<yg> are back spelling for [ik] in this text (2013: 110). Four other forms in the same text, <wrege> WRETCHED, <vezge> FETCH, <dregche> OE *dreccan* and <regche> OE *reccan*, in rhyming position, are interpreted as indicating [dʒ] for historical [tʃ] (2013: 110). No. 246 also has some <g> for etymological palatalised *k (PDE /tʃ/), in e.g. <euerruge> EVEREACH and <ginke> ‘WHOOPING COUGH (cf. OE *cincung* BOISTEROUS LAUGHTER)’ (2013: 111). Lass & Laing therefore take <ig>/<yg> to represent [idʒ] <[itʃ], and to be examples of a ‘minor change of [tʃ] to [dʒ] in early Middle English, which continued into late Middle English at least in the word CHURCH, but apparently did not last’ (2013: 111).⁵⁷

Lass & Laing’s interpretation seems logical, and the <g> forms may thus constitute the best circumstantial evidence for the existence of at least a phonetic pre-affricate [dʒ] in the thirteenth century. However, their suggestion that there was a sound change involving the voicing of [tʃ] need not entail that the OE <cg> words also had [dʒ]: phonetic voicing of [tʃ] would necessarily give [dʒ], but that is not to say that etymological <cg> words had [dʒ] at the time. Besides, it is uncertain whether [tʃ] had been reached by this stage; it could equally have been [tʃ], which, if voiced, would become [dʒ]. The <g> spellings still need to be explained, and their origin must probably be sought in French, which used <g> and <j> for [dʒ]. Third, even if Lass & Laing’s assumption is correct, i.e. that <ig>/<yg> is unlikely for [ik] because there are no <c/k> for [g] in no. 263, there is also a second interpretation: It could be that the final consonant of ‘I’ was voiced in unstressed position, giving <ig>/<yg>; voicing may be a type of lenition, and coda lenition/voicing is not unheard of in function words (e.g. in *is*, *was*, *has*, *as*). In fact, Lass & Laing point out that no. 263 has a few spellings like <fetd> FEET, <brytd> BRIGHT, <mytd> MIGHT, which to them ‘might suggest that original [t] was perceived as having some degree of voicing, perhaps because of possible loss of aspiration’ (2013: 110). Thus, what the spelling system of the scribe of no. 263 may indicate is in fact more general voicing of etymologically voiceless stops in final position. If so, this also explains the <wrege>, <dregche>, <vezge> and <regche> for words with etymological [tʃ] (or its precursor): they simply indicate voicing of a stop consonant. Together with the one <echʒe> EDGE found in *LAEME*, they may still indicate phonetic affricates ([tʃ]/[tʃ̥]/[tʃ̥] and [dʒ]/[dʒ̥]/[dʒ̥]) in the mid-to-late thirteenth century in the (S)W Midlands. Minkova concludes that ‘bisegmental perception and production of the pre-affricates [tʃ] and [dʒ] is an option until at least the end of the fourteenth century’ (2019: 178).

Lass & Laing’s most important claim, for our purposes at least, is that any Caroline <g> may correspond to [dʒ] by itself; to deal with this claim properly, all ME texts which use the Caroline <g> should be submitted to close analysis. That is, however, beyond the scope of the present article, but remains a topic to be explored in the future.

⁵⁷ But *LALME IV* 145a gives <cherge> and <chergys> CHURCH from Somerset and Essex, respectively, and 145b has <churge> in a source from Oxfordshire.

7 Conclusions

This article has argued that the traditional assumption that OE had full-blown phonemic affricates /dʒ/ (and /tʃ/) for OE <cg> (and <cc(e)>) is wrong, in that the evidence for any such in OE is conspicuously absent. The argument that occasional OE <cg> and <cc(e)> for earlier <d#g> and <t#g> must imply that <cg> and <cc(e)> always correspond to affricates is tenuous at best, as true back spellings are bidirectional, which is not the case for <cg> and <cc(e)>: There is not a single <d->-type or <t->-type spelling for OE <cg> and <cc(e)> in the entire corpus of OE and early ME texts. It is not until the fourteenth century that <d-> and <t-> for OE <cg> and <cc(e)> make an entrance, and it is also in this period that words with assumed initial [tʃ] <ch> start to be used in alliteration with words with initial etymological /t/ <t> (Minkova 2016: 41).

My suggestion that OE <cg> corresponded to [ʃ(j)] agrees well with the assumed sound value of Gmc *g(g)j in the other early Gmc languages, and with the spelling system of OE: <c> and <g> had a range of sound correspondences depending on context, which is a reflection of the fact that the Roman alphabet was not particularly well suited to represent the sounds of Gmc. Thus, <gg> and <cg> were both used for geminate velar/palatal plosives; eventually <gg> was settled on for the velar geminate, which left <cg> for the cluster with a geminate palatal plosive and an approximant, in which <g> corresponds to [j], and <c> is used like a plosive diacritic for [j] to indicate the different manner of articulation of the two sounds. The suggested [ʃ(j)] also makes sense with respect to the large body of OE and ME spellings, in which <cg>, and variants <gc>, <cgc>, <cgg>, <gcg>, <gg>, <ggc> and <cge> are used in OE, and <g> (g) reigns supreme in ME. Clearly, this shows that ME scribes found the letter <g> to be the best fit for the realisation of the reflex of OE <cg>, and it suggests that this realisation was relatively uniform across the country, although uniformity of spelling does not preclude realisational variability; usually in ME, however, realisational variability is expressed through spelling variation.

I take Orm's use of Caroline <g> for OE <cg> only (and always) to indicate that his phonetic realisation of OE <cg> was different from those of the reflexes of singleton Gmc *g, and was thus neither [g], nor [ɣ], nor [j], and certainly not [dʒ]. It may have been [ʃj], [jʃ] or [ʒ] (given that Orm's spellings do not really allow for a bisegmental analysis). As for the path of development from OE [ʃ(j)] to late ME [dʒ], a process of dissimilation plus assimilation similar to that observed in Romance languages is most likely, i.e. [ʃj] > [dj] > [dʒ]. If Orm's spelling corresponded to [ʃj], the same applies; if not, an alternative path [ʃj] > [jʃ] > [ʒ] > [dʒ] is not entirely improbable.

The *LAEME* material has <g(g)> for nouns, and either <g(g)> or <ei/ai> for the verbs, which shows that the developments of the sound in the two lexical sets had started to split in the earliest ME. Vocalisation or levelling was under way c. 1150, and may have started in the South-East Midlands (Suffolk) and North-West (Cheshire). The only *LAEME* spelling that could indicate affrication and assibilation is <chʒ> in *EDGE*, in a text whose language has been localised to Herefordshire (no. 273, 1225–49). Lass & Laing (2013) report a handful of <g> for presumed [tʃ] (also in *LAEME*), which may indicate

voicing to [dʒ] and which stem from the same period and area as the <chʒ> form (i.e. the South-West Midlands of the mid-to-late thirteenth century); these provide possible evidence for phonetic affricates [tʃ] and [dʒ]. Forms with <d> in the words in question are first attested *c.* 1387, and then in a few tokens in the fifteenth century (*MED*).

Finally, it seems likely that the affricate stage was reached earlier for the voiceless sound than for the reflex of OE <cg>. The French-influenced <ch> for the reflex of OE <cc(e)> in ME appears very early, and the <h> seems to suggest a fricative realisation of the preceding consonant; indeed, <ch> remains the typical spelling for /tʃ/ in PDE. The story is different for the voiced consonant, for which <dg> makes an entrance only in the fourteenth century. It remains a possibility that the reflex of OE <cg> had indeed merged with that of French [dʒ] at a slightly earlier stage, but that the spelling tradition for French [dʒ] prevented any unambiguous evidence from appearing until later. Phonemicisation of /dʒ/ thus cannot have taken place earlier than the thirteenth century, and was quite possibly even later.

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