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ON THE PHONOLOGICAL AND ORTHOGRAPHIC DEVELOPMENTS OF AFFRICATES IN ENGLISH

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ABSTRACT

This paper aims at looking into some aspects of the developments of phonological and orthographic affricates in English. Some of the diachronic developments of this class of sounds in all three main periods of the history of the English language are scanned. The palatalisation of velar plosives in Old English and that of alveolar plosives in Middle English and Modern English played a key role in the introduction and development of affricates. Another source of affricates is loanwords, particularly from French in the era of Middle English. The number of the orthographic representations of the two affricate phonemes in Old English at the time of first introduction was noticeably small, but there was a significant increase in number in Middle and Modern English.

Key words: affricates, Old English, Middle English, Modern English, phonological, orthographic

1. INTRODUCTION

It can be easily noticed that the discussion of affricates in English is scattered across different sources for each of the three main periods of the history of English. The discussion of affrication in different periods of English is often done as if the general principles of the process in each period were unrelated to those of another. This article scans the causes of the introduction and of aspects of the developments of affricates in Old English (henceforth, OE before Old English data), Middle English (henceforth, ME before Middle English data), and Modern English (henceforth, ModE before Modern English data) in a single piece of work. It also sheds some light on the relations between these developments in the different eras of English. It will be seen, for example, that the palatalisation of plosives has been a major factor in the introduction of affricates throughout the history of English, though the class of the palatalised plosive with regard to place of articulation differs according to the period: velar plosives were palatalised in Old English, whereas alveolar ones were subject to palatalisation in Middle English, and also in Modern English, too. Borrowing is another source that has contributed to the increase in the number of lexical items with affricates. This process played a significant role in Middle English, and it has been active in Modern English as well.

One of the basic assumptions in this article is that English has had two affricate phonemes since the era of Old English, i.e., /tʃ/ and /dʒ/. However, in the literature on affricates, there are some analyses that favour a larger number of affricates. In addition to the aforementioned two affricates, Cruttenden (2008:181) lists /tr/, /dr/, /ts/, /dz/, /tθ̲/and /dð̲/ as possible affricate candidates. To test the phonemic status of each of these sequences, i.e., to find out whether it functions as a single phoneme unit or as a sequence of two independent phonemic units, Cruttenden (Ibid.:182-183) conducted a five-part test. Each of these sound sequences was examined in terms of its distribution, possibilities for commutation, ability to be subject to glottalisation, the native speakers' intuition towards it, and the speech errors that involve it. The results show that in four components of the test /tʃ/ and /dʒ/ function as phonemic units. The

only test that /tʃ/ did not pass was glottalisation in which /ʃ/ behaves as a separate following a consonant.

2. AFFRICATES IN OLD ENGLISH

Proto-Germanic, of which Old English was a descendant, had no affricate sounds. The emergence of the two affricates /tʃ/ and /dʒ/ (in addition to the fricative /ʃ/) in Old English introduced a new contrastive place of articulation, i.e., the palatal, which had not been found in Old English before (Lass 1995:53). Instead of having three places in which obstruent sounds contrast, i.e., "labial, dental/alveolar, and velar", a previously unoccupied place was added (Ibid.). The change that caused the emergence of the palatal allophones of /k/ and /g/, and which led later to the introduction of affricates, was of central importance in the phonological developments of Old English. Campbell (1983:173) described the change as "an outstanding feature of Primitive OE". For some researchers, it is singled out as "the most important phonemic change in the OE consonants" (Plotkin 1972:34).

Before we embark on discussing the process of palatalisation that led to the introduction of affricates into English, it seems important to refer to the general elements of similarity between the consonantal system of Old English and that of Modern English. The phonological system of Old English consonants is often described as being, on the whole, similar to that of Modern English (Fennell 2001:60; Hogg 2000:89; Singh 2005:75-76). The basic classes of sounds, i.e., stops, affricates, fricatives, nasals, laterals, retroflexes and semivowels remain the same. The difference, in my opinion, is mainly of expansion nature. Old English, for example, had /f θ s/ only. In Modern English, the gaps in the phonemic set regarding the missing voiced fricatives are filled. As for affricates, the similarity between Old English and Modern English is even greater, for English has had two affricate phonemes since the era of Old English.

In discussing the features of the sound system of Old English, "we have to rely for almost our entire knowledge of the language's phonology…upon the testimony of orthographic representations" (Jones

1989:9). The use of orthographic data to arrive at phonological information would not have been possible if Old English had not been written relatively 'phonetically'"(Burnley 1996:2). The reasonable degree of correspondence between spelling and pronunciation distinguishes Old English from Modern English whose spelling system is often described as illogical because of the lack of correspondence between the orthographic symbol and the sound. Singh (2005:77) points out that the orthographical system of Old English has an advantage over its counterpart of Modern English by having "more transparent correlation between graphs and pronunciation".

Palatalisation[1] of the velar consonants /k/ and /g/ before or after front vowels led to the appearance of affricates in Old English (Campbell 1983:173-175; van Gelderen 2006:52; Krygier 2000:462) giving forms such as:

(1) Old High Germanic *kouf*→OE *ceēap*→ME *chep*→ModE 'cheap'
(2) OE *spœc*→ME *speche*→ModE 'speech'
(3) OE *hrycg*→ME *rigge*→ModE 'ridge'

Before exploring specific aspects of the velar stop palatalisation that led to affricates in Old English, a digression is necessary at this point. It is prudent to ask why velars in particular were subject to palatalisation yielding affricates, and not to other classes of (stop) sounds. Various sources (Hock 1977 cited in Domagala 2013, among others) consider velar stops the most probable sounds to undergo palatalisation cross-linguistically. Front vowels were found to be "the most common palatalizers" (Ibid).Both conditions were met in Old English: the velars /k/ and /g/ were palatalaised when preceding or following front vowels. Studies (Wilson 2006; Blevins 2004:139) also found that, before front vowels, velar stops and (postalveolar) affricates are similar articulatorily, acoustically and perceptually.

Linguistic investigations into different languages (Blevins 2004:138; Kawahara 2011:2292) show that velar stop palatalisation is a widespread

[1] Unless stated otherwise, the term palatalisation in this article is used as a synonym for affrication.

phenomenon in the languages of the world noting that voiceless velar stops are more subject to this process than their voiced counterparts.

In addition to /k/ and /g/, their long counterparts /k:/ and /g:/ were also subject to the process (Plotkin 1972:35). Whereas three of these sounds are stops: /k/, /k:/ and /g:/, /g/ can be both a stop or a fricative depending on the context (Ibid.).According to Campbell (1983:173), the palatal spirant /g/ corresponded to Proto-Germanic /i/which is realized as a palatal approximant /j/ in Modern English. During the initial stages of change, /k/ was different from the three other sounds in its ability to occur in initial positions (Plotkin 1972:35). /k/ was subject to palatalisation when followed by any front vowel. In noninitial positions, all previously four velars were subject to palatalisation provided that the following vowel is /i/ (Ibid).

Lass (1995:53-54) discusses the spelling conventions of Old English that are used to detect whether the graph at hand represents an affricate or not. The graphs *c* and *g* in Old English were used to represent both velars and palatals. *c*[2] was used to represent voiceless velars and palatals, i.e., the velar stop /k/ and the affricate /tʃ/, whereas the letter *g* was used to represent the voiced ones, i.e., the voiced velar stop /g/, and the palatal approximant /j/. The distinction as to whether *c* is a velar, i.e., /k/ or a palatal is made on the basis of the following sound. The letter *c* was pronounced as a palatal if it was followed by a front vowel "or one that had been front in early Old English" (Pyles and Algeo 1993:104) as in *ācēocian* 'choke'; it was a velar when followed by a back vowel or a consonant as in *cōc* 'cook' and *crēopan* 'creep'. /k/ also fails to palatalise, and it retains its velar value when a consonant becomes contiguous to /k/ as a result of the deletion of the unstressed [i] (Kryger 2000:462).

As mentioned above, the letter *g* in Old English was used to represent two different phonemes: the voiced velar stop /g/ and the semivowel /j/. When g occurred before a back vowel or a consonant, it represented the velar stop as in *gōld*' gold' and *grōwan* 'grow'. The graph *g* stood for /j/ elsewhere, e.g., *geogð*/*geong* 'youth', *gise*/*gēse* 'yes', and *weg* 'way'. An allophone of the latter phoneme is the voiced velar

[2] Barber (2000:110) notes that *k* was not among the letter symbols used in the spelling of Old English.

fricative [ɣ] when *g* "occurred undoubled between two vowels" (Barber 2000:111). This allophone developed later into the Middle English /w/ as in *lagu* law.

Lass (1998:71) further notes that, particularly in West Saxon, when *c*- and *g*- were used to represent palatals they were often followed by "<*e*> or <*i*>, as in *ceaster* [tʃæster] 'camp', *giefan* 'to give' [jevan]."

The diagraph *cg* in Old English forms represented the modern sound /dʒ/. The words 'bridge', 'fledge', 'midge', and 'ridge', for example, were spelt *brycg(e)*, *flycg(e)*, *mycg*, and *hrycg*, respectively. It seems that the use of *cg* to indicate the voiced affricate was common finally in Old English words. A possible exception to this tendency was the OE word *cycgel* 'cudgel'.

Burnley (1996:3) lists the following Old English front vowels *e i eo ea* that represent the environment in which palatalisation takes place. But the process of affrication before front vowels is not as straightforward as it seems. There are instances of velars before front vowels that palatalized, and other velars that did not. The following examples can be used to illustrate the point.

(1) *c* → /k/ as in *cyning* 'king'
(2) *c* → /tʃ/ as in *cyse /cēse* 'cheese'
(3) *c* → /tʃ// as in *ciele/cēle* 'chill'
(4) *c* → /k/ as in *cyssan* 'kiss'

The examples 2 and 3 present no problems since they follow the rule that palatalises /k/ before front vowels to become /tʃ/. Examples 1 and 4 violate this rule since the vowels in these examples are front, but they do not result in the palatalisation of the preceding consonants; consequently, *c* is realized as a velar (stop). The explanation for this seemingly confusing state of affairs is that when *c* in Old English fails to palatalise, it is "likely to find (a) evidence for a historical back vowel in the root (whether the word is native Proto-Germanic or a loan word from Latin or elsewhere; and (b) an /i/ or /j/ in the following syllable of an ancestral or ancestor-like form" (Lass 1995:55). Inspection proves this point of view to be correct. The Old High German word that OE *cyssan* is akin to is **kussen*, i.e., with a back vowel. The same applies to OE *cyning* which

was derived from the OHG **kuning*. The failure of palatalisation in these and other similar cases was caused by the fact that these front vowels that block this process "are secondary, not original" (Ibid).

Lass and Anderson (2010:133) shed more light on other aspects of the palatalisation process. For /k/ to change to /tʃ/, the following vowel must be front regardless whether or not umlaut takes place. If the voiceless velar stop is followed by a back vowel and umlaut does not take place, the resultant sound is /k/. Similarly, if the vowel in the sequence /kV/ is back and the conditions for an umlaut exist, a velar stop results.

Plotkin (1972:34-35) discusses the chronological relationship between i-umlaut and the split of the back consonant /k/ into the velar [k] and the palatal [k'][3]. He refers to the general assumption that i-umlaut took place after the split since, unlike the original front vowels, the front vowels that resulted from i-umlaut hindered the palatalisation of /k/.This means that, "the umlauted front vowels occurred when the allophonic variation [k~k']under the assimilative influence of the front vowel had already stopped" and "when the …allophones had become separate phonemes and no longer responded to changes in their vocalic context" (34). According to Plotkin, this assumption is inaccurate. After discussing previous theories on the issue and raising questions that cast doubt on their validity[4], Plotkin concludes that the phonemic split of the velar stops and i-umlaut occurred simultaneously (37). Moreover, i-umlaut and the split of /k/ in Old English are two manifestations of the same process. On the one hand, Plotkin (1972:35) notes that in the initial stages of i-umlaut, diphthongs with the sequence of back-to-front segments were created. The split of /k/ into [k'] allophone co-occurred with i-umlaut, and that explains the failure of the velar stop to have palatalised before certain front vowels since the failure occurs when the immediate vowel following the velar was back. Later, these back-to-front diphthongs became front vowels (Ibid).Historically speaking, Plotkin thinks that the process of the split together with that of i-umlaut occurred

[3] The same applies to /k:/, /g:/ and /g/ when they represented a stop (Plotkin 1972:35).

[4] Two important questions were raised by Plotkin. One question concerns why the occurrence of the velar and palatal allophones ceased before iumlaut. The second question regards why the variation ceased during i-umlaut (Plotkin 1972:34).

simultaneously over the span of the fifth and sixth centuries (37). The affrication process was completed by the ninth century (Ibid.).

Despite the evidence that the velars /k/ and /g/ seemed to have developed into the affricates /tʃ/ and /dʒ/, respectively there is no agreement on how and when exactly the development took place. Researchers acknowledge the differences between palatalised /k/ and /g/ in their development into /tʃ/ and /dʒ/, respectively. Lass and Anderson (2010:132) note the "dissymmetry in the developments of palatalized /k/ and /g/."Hogg (2000:107) observes that the way in which /g/ changed into a palatalised [ġ] and then into /dʒ/ was more complicated than that undergone in the case of /k/→/tʃ/.

As for the development of /k/ into /tʃ/, there are different opinions as whether the change is direct with no intermediate stages, or whether it involves some intermediate stages along the path from /k/ to /tʃ/. Lass and Anderson (2010:132) presume that there was a medial stage, i.e., a palatal stop /k'/ which they choose to give the symbol /c:/. This symbol stands for a " 'prevelar, postalveolar stop with a strident release'." The two writers sketch some of the possibilities of the path of the development of /k/ into the affricate /tʃ/, though they do not agree with these possibilities and do not feel that they are crucial to explain the process. One possibility is the gradual development of a stop into an affricate through the following intermediary stages:

[k] **>** [k'] **>** [c] **>** [tj] **>** [t]

Lass and Anderson (2010:132) are not inclined to support this theory of gradual development because, in their opinion, "there is no synchronic justification for this 'gradual sound change' ". The discussion leads the two authors to use the symbol [c] to refer to [k′] for what they describe as the lack of explanation from a synchronic point of view, and they describe it as a" 'prevelar, postalveolar stop with strident release'" (Ibid.).The rule called assibilation which is suggested by Lass and Anderson (Ibid.) to account for the development of affricates from [c] is:

$$\begin{bmatrix} +\text{obs} \\ -\text{cont} \\ -\text{voice} \end{bmatrix} \rightarrow [+\text{strident}] / \begin{bmatrix} \_\_ \\ -back \\ +high \end{bmatrix}$$

Lass (1995) seems to be more accepting of the theory that the development of *c* [k] (before a front vowel) into [ʧ], and [g] (again before a front vowel) into [dʒ] involved several stages. The processes

hardening→ backness accommodation→ palatal softening

are suggested to describe the change from reconstructed West Germanic [k] into Old English *c* [ʧ] (p. 56). (Hardening means the change into a stop sound; backness accommodation means palatalisation; palatal softening is the change from a stop into an affricate).The processes involved in this order cause the following changes:

*ki- →ci- →ʧi- (hardening is not needed since [k] is already a stop). /i/, here, represents a Proto-Germanic front vowel.

It is also possible that hardening occurred as the last process in this series and, based on this, the change took the following form:

*ki- →ci- →ʧi- (again hardening took place for the same reason mentioned above (Ibid.)

As for the development that resulted in [dʒ], the sequence:

hardening→ backness accommodation→ palatal softening

causes the reconstructed velar fricative *γi to change in the following way:

*γi- →gi- →ɟi→ ji[5]. (/γ/ stands for a voiced velar spirant; /ɟ/ stands for a voiced palatal stop, and /j/ represents the voiced affricate.)

If the order of the processes is:

backness accommodation→ palatal softening→hardening,

the change will be *γi- →ji-

Lass (Ibid.) acknowledges that it is hard to accept one version of the account and not the other, and he also espouses the sequence of processes with hardening occurring late because it is less complicated.

Another environment in which /g/ and /k/ became [dʒ] and /tʃ/, respectively is in the vicinity of a sonorant. The OE words *sengan/sencgan* 'singe', *cringan* 'cringe', and *swingan* 'swinge' are possible examples of a palatalized /g/ clustering with /n/. /k/, on the other hand, clustered with /l/ producing forms such as *hwelc* 'which' and *swelc* /*swilc* 'such'. Nevertheless, it must be noticed that the normal trigger for palatalisation (that leads to affrication) is always in the scene, i.e., a front vowel precedes the consonant clusters *ng* and *lc*.

From the description above, we find that, at one stage, OE *c* had two possible pronunciations, namely, [tʃ] and [k]. The two sounds, as is the case with all allophones, were in complementary distribution. That is, the first allophone occurred before (or after) front vowels whereas the second one occurred elsewhere. An often quoted example is found in the words *cin(n)*'chin' and *cyn(n)*'kin'. At one point in Old English, the major and distinguishing difference between the two words was that the vowel in the first word was front and unrounded whereas the second word had a front and a rounded vowel. Another, but a less important difference, was in the consonants that began the words: *c* in the first of the two words above represented a palatal stop sound, whereas *c* in the second word represented a velar stop sound. Barber (2000:111) notes that towards the end of the era of Old English, the difference in the rounding of the two vowels was lost for the majority of speakers. This change which is called

[5] "[ɟ] is a voiced palatal stop, as in the initial of *geese*" (Lass 1995:56)

"**loss of the conditioning environment**" (Trask 1996:78) (highlighting is Trask's) means that "the front vowel that had formerly conditioned the allophone [tʃ] was lost, and hence the distribution of [k] and [tʃ] was no longer predictable" (Ibid.) since both front vowels had become unrounded. Meanwhile, the difference caused by the palatalisation of /k/ before front vowels became more noticeable, and it practically became the only difference between the two words. In other words, these two phonetic variants were phonemicised in Old English. Trask (Ibid.) describes this situation in which one phoneme develops into two distinctive units of sounds as "**phonemic split**"(highlighting is Trask's). That is, one phoneme, i.e., /k/ developed into two independent contrastive units of sounds.

The phonemicisation process, i.e., the split of /k/ into /k/ and /tʃ/, and /g/ into /g/ and /dʒ/ did not only include contrast in place of articulation, i.e., velar vs. palatal, it also introduced a contrast between the mellow stops, i.e., /k/ and /g/ and the new strident members of the stop family, i.e., /tʃ/ and /dʒ/ (Plotkin 1972:36).

One characteristic of Old English was that length was phonemic in consonants. That is, unlike the situation in Modern English, Old English distinguished between long consonants and short ones (Fisiak 1996:53; Lass 2006a:54). Since this paper is concerned with affricates, we will only cite the forms that include the two affricates with the letters representing the affricates in bold type:

/tʃ/ *rīce* 'rich'	/tʃː/ stre**cc**an 'stretch'
/dʒ/*cri**n**g**g**an* 'cringe'	/dʒː/ *mi**cg**(e)* 'midge'

It is normally noted that, on the whole, Old English long consonants occurred between vowels. In addition to this intervocalic position, Fisiak (Ibid.) observes that long consonants also occurred between vowel sounds and sonants (sonorants), though their occurrence in this position was less common.

The frequent use of Old English examples with palatalized [k], and consequently /tʃ/, occurring word initially may lead to the assumption that this affricate occurred in Old English in this position only. This assumption seems to be imprecise. According to (Campbell 1983:174;

Krygier 2000:462), /ʧ/ occurred word medially. Examples of palatalised /k/ which turned into the voiceless affricate word medially include *lǣce* 'leech/physician' and *gyccan* 'itch'. Old English words with /ʧ/, occurring word finally are not hard to find. OE *ǣlc* 'each', *crycc* 'crutch', and *swylc* 'such' are just instances of the words that occurred in this position. In these examples, the position of the sound [ʧ] in Old English forms matches its position in Modern English ones; both are final. This correspondence in positions is not always present in Old English and Modern forms. The sound [ʧ] is final in ModE 'reach' but it was medial in its Old English predecessor *rǣcan*. The same applies to *stice* 'stitch', *feccan* 'fetch', and *þeccan* 'thatch' whose voiceless affricate did not occur in word final positions in Old English.

Compared with /ʧ/, there is more disagreement regarding the distribution of /ʤ/ in Old English. Hogg (2000:93) notes that /ʧ/ "occurred freely" in comparison with /ʤ/ and adds that it was found "medially and finally after nasals and in gemination" (Ibid.) as in *senġan* 'singe' and *eċġ* 'edge'. Lass (2006b:121) also affirms that the phoneme /ʤ/ used to be found in postvowel positions only, but the distribution was later modified to include other positions in the era subsequent to Old English. There is no disagreement on *g/cg* realized as /ʤ/ word medially and word finally in Old English as in *cecgel* 'cudgel' and *hrycg* 'ridge'. But the words that begin with g realized as /ʤ/ are much disputed. Words such as 'gem', and 'genesis', which are sometimes used as examples of (Old English) words that begin with the postalveolar affricate, are of Latin origin. They cannot be traced to the era of Old English. These words came into the language during Middle English.

Sometimes the view of affricates occurring exclusively in initial positions or in all three positions was taken to distinguish between two types of dialects of Old English: Northumbrian, which was said to have a palatalised [k], hence /ʧ/, in initial positions, whereas in the southern dialects, the palatalised [k] was said to be found word-initially, medially, and finally. Pak (1973) investigated some of the literature on this claimed dialectal split and challenged this view by providing evidence from place names in Northumbrian English with a palatalized [k], i.e., /ʧ/ occurring in non-initial positions (74). Other words with affricates in final

positions such as *church* and *bridge* among other words were found in both northern and southern dialects (75).

One of the languages that shared the process of palatalisation with Old English was Old Frisian. The two languages are closely genetically related. They are sister languages representing the group called Anglo-Frisian languages within the West Germanic languages. Shay (2008:79) cites a number of forms in which *c* /k/ and *g* /g/ were palatalized, though the outcome of the process is not the same in the two languages. *c* in the Old English word *cīese* was palatalized to give the modern form 'cheese' with the initial affricate /tʃ/, whereas the related form in Old Frisian developed into *tsyse*. Both resultant affricates are voiceless, yet they differ in place of articulation: alveopalatal vs. alveolar. Another example cited by Shay (2008:79) is the Old English *secgan* 'sedge' and Old Frisian *sedza*. Again notice that the resultant affricates agree in voicing but differ in place of articulation (cf. *ciese* and *tsyse* just mentioned).

3. AFFRICATES IN MIDDLE ENGLISH

One of the changes that consonants underwent in Middle English was the loss of length contrast. English ceased to appreciate consonant length phonemically. Fisiak (1996:53) notes that English, throughout its history, has inclined to abolish the effect of sound quantity on the phonemic level. This loss of long consonants occurred over a long period of time depending on the dialects concerned. It began from the late 12th century in the dialects spoken in the Northeast Midlands and in some dialects in the North. As for the remaining dialects, this process was completed at the turn of the fifteenth century (55).

The frequency of affricates in Middle English increased for two reasons (Lass 2006a:93). First, new words with affricates were borrowed from French. Some of these words were particularly significant since they affricate sound occurred initially as in *chase*, *joy*, *just* and *jeopardy* (Lass 2006a:93; Lass 2006b:121).The occurrence of the voiced affricate in this position had been previously almost absent. The phoneme /dʒ/ used to be often found in postvowel positions only but the distribution

was later modified to include other positions due to the influence of French loanwords (Ibid.)

Plotkin (1972:50) refers to the increase in the occurrence of affricates, particularly/dʒ/, in addition to /v z/ in initial word positions as "the only phonological influence of French" on English. Plotkin (Ibid.) is critical of the exaggerated role that is given some times to French borrowings and adds that "their role in the phonological history of English was confined to filling distributional 'holes' which were always products of indigenous development."

It seems timely to make a remark here regarding an aspect of the distribution of affricates in loanwords from French. The occurrence of affricates in word-initial positions is related to the time of the borrowing from French. Distinction is usually made between borrowings which took place before the thirteenth century and those that took place after that time (Baugh and Cable 1993:170). Words like 'gender' and 'chart' are examples of items whose pronunciation (with initial affricates) shows that they were among the early borrowings since they maintain their older French pronunciation. Baugh and Cable (Ibid.) note that such words have continued in English with their initial affricates preserving the Anglo-Norman pronunciation, and were not affected by the changes that took place in Paris French.

Among many others, the words 'choux' and 'jete', on the other hand, signal late borrowings since the expected initial affricates were lenited to the fricatives /ʃ/ and /ʒ/, respectively (Ibid.). This of course, reflected aspects of the internal phonological change that French was subject to during the era of Middle English.

Second, Lass (2006a:93) referred to a new wave of palatalisation in the fifteenth century which continued until the seventeenth century. The major difference between the palatalisation in this period and in that of Old English is that dental/alveolar sounds, not velars, were the sounds affected. Of the dental/alveolar /s t d/ that underwent palatalisation in weak syllables, the last two concern us since they were the ones that led to more examples of the use of /tʃ/ and /dʒ/, respectively. The words *christian* and *soldier* are examples of this phenomenon in Middle English (Lass 2006a:93). Lass (Ibid.) also refers to the sequences [tj] as

in tune and [dʒ] as in *dune* that inconsistently, "as still in Modern English", ended as [tʃ] and [dʒ], respectively.

The use of /k/ vs. /tʃ/ continued to have a sociolinguistic impact in Middle English. It used to distinguish two main types of (geographical) dialects. Krygier (2000:462) notes that Northern dialects favoured /k/ over /tʃ/ which was favoured by the Southern dialects. The writer further explains that there was a tendency among speakers of Middle English in the south and west to use palatals whereas the speakers of the varieties in the north and east were inclined towards the use of velars (466).

As for the representation of affricates in the writing system of Middle English, it is noticed that the expression of /tʃ/ in spelling varied from using one symbol, i.e., the OE *c*, a digraph, i.e., *ch*, a trigraph, i.e., *cch*, or even a tetragraph, i.e., *chch*. The graph *c* continued to be used to represent [tʃ] when it occurred before front vowels, and [k] elsewhere (Ibid.). Fisiak (1996:20) observes that the spelling *c* to represent [tʃ] was used in Early Middle English. On the whole, it is noticed that in the Middle English spelling system the phonetic variants of *c*, i.e., [k] and [tʃ], "were orthographically disambiguated" (Singh 2005:114). That is to say, *ch* and related forms were established to represent the palatalised allophone, whereas *c* was reserved for the velar: *child*, 'child', *care* 'unhappiness', *cunde* 'nature' and *clerc* 'priest, cleric' (Ibid.).

Burnley (1996:64) points out that certain developments slowly took place in the orthographic system of English during the thirteenth century, and that they included using *ch* instead of *c* (before front vowels). Other ways used to represent /tʃ/ in this period were *cch-* and *chch-*. Fisiak (1996:20) cites the Middle English word *cacchen* 'catch' as an example. This word, according to Pyles and Algeo (1993:138), appeared in the scripts of Middle English as *cache*, *cacche*, and *cachche*. The word 'church' according to Fisiak (1996:20) appeared as *circe*, *chirche*, *cherche*, or *churche*. It seems that the use of different ways to spell /tʃ/ in the same word may be explained in one of two ways.

First, this variation may refer to dialectal variations which were reflected in the spelling system of Middle English. The other possibility is that during the era of Middle English no single way of representing the voiceless affricate had been agreed upon since there was no one "centralised authority to legislate...writing in standard

form"(Burnley1996:64). In other words, the process of standardisation had not been completed.

As for [dʒ], *cg* in Old English spelling traditions systematically changed to *gg-*, and later to *dg-*. Pyles and Algeo (1993:139) notice that the originally French *gg-* was used in Middle English to replace the Old English *cg* when it occurred word medially and finally. Consequently, the spelling of the words *bridge, fledge, midge,* and *ridge,* which were mentioned above in the section on Old English, experienced a change in which the voiced affricate was represented by the digraph *gg-* yielding ME *brigge, flegge, migge,* and *rigge.* Fisiak (1996:20) notes that this spelling was used when *gg-* occurred intervocalically. Nevertheless, other variants of spelling were used. Barber (2000:152) lists the single letters *i-, j-,* and *g-* which were used to spell the word 'judge': *iuge, juge*. Fisiak (1996:20) explains that *g-*, when used to represent /dʒ/, was used at the beginning of words, e.g., *gelus* 'jealous'. It was also used when the voiced affricate co-occurred with *n-* and the sequence of the affricate and the nasal were preceded and followed by front vowels as in *sengen* 'singe'. Again, as stated earlier, the specification of the nasal in *sengen* and other similar forms may seem unnecessary as /dʒ/ still occurs in pre-front vowels contexts. The common Modern English digraph *dg-* was used in Middle English, but Fisiak (Ibid.) observes that it was rarely used before the 15th century as in *bridge* ' bridge'.

As indicated above, Middle English witnessed the taking on of diagraphs to represent certain consonants. Reference has already been made to the use of *ch-* to stand for /tʃ/, though, as noted by Burrow and Turville-Petre (1994:13), this way was not completely adopted in all of the scripts of that period, and the writers cite the word 'child' which was written either as *child* or *cild*. Other Middle English examples that illustrate this point are *chest, chaf,* and *challenge* which had the alternative spellings *cœste, caf/café,* and *calenge,* respectively (Mayhew and Walter 1888). As for /dʒ/, Middle English continued the practice of Old English in using a combination of two letters with a slight change, i.e., using *gg-* instead of *cg-* under the influence of French.

4. AFFRICATES IN MODERN ENGLISH

Again, the direction of sound development in Modern English is not dissimilar to that in Middle English. Unlike the vowel system, consonants of English have not seen any major changes. No change, for example, has occurred to the number of affricates in Modern English; English still has two affricate phonemes. Similar to what was mentioned about the developments in Middle English above, the alveolar stops /t d/ in early Modern English occurring in unstressed syllables following stressed ones, as in the words *lecture* and *soldier*, developed into /tʃ/ and /dʒ/, respectively (Mayhew and Skeat 1888). Nares (1780), cited in Lass (2006a:93), refers to words like *grandueur*, about which he was unable to determine whether or not to argue that their pronunciation was done with [dʒ]. As for words such as bestial and celestial, there is agreement between Nares's assessment and their pronunciation in Modern English, i.e., both could and can be pronounced with [tʃ]. Lass (Ibid.), on the other hand, cites the words *courtier* and *frontier* as examples of differences in pronunciations between Nares's English and nowadays' English.

According to Nares, both words had [tʃ], whereas Lass (Ibid.) excludes the possibility of pronouncing them with [tʃ] in an "any ModE variety"[6].

This development might have been preceded by pronunciations with the semivowel /j/ giving /tj/ and /dj/ (Millward and Hayes 2011:247). This is still felt in the fluctuation between /tj/ and /tʃ/, and [dj] and [dʒ] in the pronunciation of some words, e.g.,

(1) *educate*→[edjukeɪt] and [edʒukeɪt]/ [edʒəkeɪt]
(2) *question*→[kwestʃən] and [kwestjən][7]

[6] Though this is true in the case of the word *frontier*, the same does not apply to *courtier* since it can be pronounced with [tʃ] at least in American English as listed in among the possible pronunciations according to Webster's.

[7] [kwestjan] is included as a possible pronunciation in *Longman Pronunciation Dictionary* (Wells 2008).

In addition to the context of unstressed syllables in which /t/ and /d/ developed into /tʃ/ and /dʒ/, Modern English witnessed another development in which the sequence /tj/ was subject to palatalisation. Lass (2006b:122) notes that the number of cases in which the sequence /tj/ was subject to palatalisation in strong syllables had become enormous. Lass (Ibid.) citing Robert Nares refers to words like *Tuesday* and *tune* in which the initial sequence /tj/ was pronounced as an affricate, though not in the speech of the eighteenth century "elegant speakers". Though Nares made no mention of it, Lass (Ibid.) finds it somewhat odd that the sequence /dj/ did not have an alternative pronunciation as /dʒ/; a pronunciation which in fact did exist. Singh (2005:153) refers to the merger resulting from [d] occurring word medially and preceding [j]. In the seventeenth century, the word *Indian*, for example, was normally pronounced with a medial [dʒ] instead of the sequence [dj]. Two centuries later, this pronunciation became unacceptable, and it was taken over by the previous "spelling pronunciation" (Ibid.).

Hall and Hamann (2003:129) investigated the change from /t/ and /d/ into [tʃ] and [dʒ], respectively in more detail. They found that these two alveolar stops surface as affricates before suffixes that begin with /j/ and across word boundaries, particularly when followed by the pronouns *you* and *your*. Examples of the former case are *perpetual* [pərpetʃuəl] (to appreciate the change compare the word *perpetuity* [pɜ:pətjuəti]) and *residual* [rɪsɪdʒuəl] (again to sense the change compare the word [resdju:]) (Ibid.). *What you* [wɒtʃjə]and *had you* [hæ dʒjə] "in casual speech" are instances of the change in the second case (Ibid.). Here, /t/ and /d/ change to affricates due to the palatalisation effect of /j/ that begins the following (free) morpheme.

Pyles and Algeo (1993) draw attention to certain spellings, e.g., *-ture* and *–dure* as in *nature*, *verdure* that are pronounced nowadays with /tʃ/and /dʒ/ and point out that they had been pronounced differently until the 1800s. These forms were pronounced with t+ ər and d + ər, respectively. Even books on spelling written towards the middle of the nineteenth century, like *Webster's Elementary Spelling Book* (1843),

continued the practice of not using affricates in words like *fortune* and *virtue* (177).

The trend called "continental pronunciations"(Barber 2000:237) is responsible for the loss of affricates in some Modern English words. This development is caused by loanwords which found their way into the pronunciation of speakers of English. It is due to "the spread of higher education and of foreign travel" (Ibid.). An example given by Barber (Ibid.) of words affected by this change is *chivalry*, which is pronounced nowadays by almost all speakers with an initial /ʃ/ rather than /tʃ/.

One interesting observation about affricates in Modern English is that some velar stops, particularly /k/, failed to undergo palatalisation. Ihalainen (1994:204) cites F. Brokesby (1691) who noted that speakers of the dialect of East Riding of Yorkshire used the voiceless velar stop instead of the voiceless affricate in the words *chaffe* and *churn* yielding the forms *caffe* and *kern*. Ihalainen (1994:208) also refers to the observation of William Marshall (1788) that some speakers of Yorkshire English used the form *kirk* instead of *church*. Marshall, quoted by Ihalainen (1994:208), explained that the form *kirk* was "still pretty common in the vulgar dialect"', and further explains that "Marshall's 'vulgar dialect' refers to the most marked variety of northern English". Ihalainen (Ibid.) noticed that Marshall had a sense of surprise about his finding, but what would be more surprising for Marshall is to know that in the middle of the twentieth century some speakers still used the same pronunciation, i.e., *kirk*, which Marshall described in the eighteenth century "as an old northern form" (Ibid.).

Researchers also report some differences in pronunciation between the English of the eighteenth and nineteenth centuries, and present day English regarding words with affricate sounds. Citing eighteenth century orthoepists, MacMahon (2007:486) lists the words *Norwich* and *ostrich* as examples that used to end with /dʒ/. It seems that a change of voicing has taken place. In present day English the former is almost always pronounced with /tʃ/, whereas the latter is normally pronounced with /tʃ/, with a less common alternative with the voiced affricate. Other examples of differences in pronunciation involving the voiceless affricate include *chaldron*, *chart*, and the example of the word *chivalry*, which has already been discussed. The initial sound in chaldron was pronounced as [k]

according to writers on pronunciation in the eighteenth century (485), whereas the normal pronunciation of the initial sound of this word in present day English is [tʃ]. The sequence *ch-* in the words *chart* and *chivalry*, was pronounced as either [k] or [tʃ] (Ibid.), but it is normally pronounced as [tʃ] nowadays. In the eighteenth century, the graph *g* in the words *gibberish*, *gimlet*, and *gyration* used to have the value of [g] only (Ibid.). It seems that only *gimlet* has continued to begin with [g], whereas *gibberish* is normally pronounced with [dʒ] with another uncommon pronunciation with [g]. The word *gyration*, on the other hand, is almost always pronounced with [dʒ].

In Modern English, /tʃ/ is represented in spelling in eight different ways. In Webster's ninth new collegiate dictionary (1990:38), the following ways are listed:

(1) *c* as in *cello*
(2) *ch* as in *chin*
(3) *czas* in *Czech*
(4) *si* as in *tension*
(5) *te* as in *righteous*
(6) *ti* as in *question*
(7) *tch* as in *match*
(8) *t* as in *nature*

Comment is required on some of these ways of representing /tʃ/. A general comment is that the spelling conventions used to indicate this sound in present day English are more variable than those used in Old English or Middle English. This may be due to the increase in the number of words with /tʃ/ that have entered the language. More specific comments regarding these ways follow. The first way, i.e., *c* as in cello, which is uncommon in the language nowadays, is a reminder of Old English orthographic conventions. This word is also of foreign origin: it is derived from the Italian *violoncello*. The use of the digraph *ch*, which started in Middle English (under the influence of French), represents the most commonly used spelling to indicate the voiceless affricate in Modern English as in *chew* and *chill*. *Cz-* is rarely used to represent this

sound, *Czech*[8] and *czardas* may be the only words that make use of this digraph for /tʃ/. Both words are of foreign origins: Czech and Hungarian, respectively. The use of *si-* and *ti-* in *tension* and *question* is a matter of choice since both words can be alternatively pronounced with /ʃ/ instead of /tʃ/.

As for /dʒ/, Webster's ninth new collegiate dictionary (1990:38) lists ten ways of spelling words nowadays which include this phoneme. They are as follows:

(1) *g-* as in *gem*
(2) *j-* as in *joy*
(3) *ch-* as in *Greenwich*
(4) *dg-* as in *bridge*
(5) *di-* as in *soldier*
(6) *dj-* as in *adjective*
(7) *gg-* as in *exaggerate*
(8) *gi-* as in *region*
(9) *jj-* as in *hajj*
(10) *d-* as in *graduation*

Again, the general comment mentioned in the case of /tʃ/ is applicable here. Another comment of general nature is that seven of these ten ways involve a diagraph. Once more, some specific comments are necessary. The words in which g is used to represent /dʒ/ are mainly of French origin, e.g., *general* and *giant*. Some words that begin with *g-* pronounced as /dʒ/ came from other foreign sources, as in *gigas* [dʒɪgæs] 'a kind of plant' which came into English from Greek through Latin. A few Old English words in which g was used to represent the voiced affricate are still used. An example is the word ginger [dʒɪndʒə] from OE *gingifer*, though it came into Old English from Latin. The words with the initial *j-* pronounced [dʒ] came mainly from French, such as the word *juice* from Old French *jus* "juice, sap, liquid", *just* "from Old French *juste* "just, righteous; sincere", and join from Old French *joindre* "join, connect, unite…"(Harper 2001). Certain words with the same

[8] And of course the related words Czechoslovak and Czechoslovakia.

grapheme-phoneme relationship came from other languages, such as the word *jungle*" from Hindi *jangal* "desert, forest, wasteland, uncultivated ground" (Ibid.). The use of *ch*, which is normally used to indicate the voiceless affricate, to represent the voiced affricate is unusual, and this is supported by first, the rarity of the words that use this digraph and, second, by the existence of another pronunciation of this word as [gri:nɪtʃ].The use of *gg-* is a reminder of the Middle English spelling convention which was a development from OE *cg-* which later developed into Modern English *dg-*.The two-letter spelling *jj-* in the word *hajj* is a reminder of its Arabic origin, i.e.,[ħæ dʒdʒ] in which the word is pronounced with a geminate /dʒ/.[9]

Two further comments are called for. One regards the representation of /dʒ/ in Early Modern English spelling by the vowel symbol *i-*. Singh (2005:151) points out that probably until the first forty years of the seventeenth century this symbol was used to represent both vowels and the voiced affricate as in the spelling of the words " *iack* ('Jack') and *iolly* ('jolly')". This practice probably continued up until sometime in the first forty years of the seventeenth century. The second comment concerns the use of word-final *–e* together with the letter *g* to represent the voiced affricate. According to (Singh 2005:150), the significance of this *–e* is "to indicate certain consonantal qualities". For example, the word *rage* with /dʒ/ is distinguished from *rag* with a (final) velar stop by the presence of a final *–e* in the former (Ibid).

5. CONCLUSION

From the discussion above, two influential factors have been identified to have played important roles in the phonological developments of English affricates, namely, palatalisation and borrowing. It is clear that, throughout the history of English, palatalisation has played a key role in the introduction and development of affricates. In Old English, the velar stops /k/ and /g/ were palatalized in the vicinity of front vowels yielding /tʃ/ and /dʒ/, respectively. This phonological

[9] This geminate sound, as is the case with Arabic geminates, is also indicated in spelling by a special diacritic.

process continued in the period of Middle English, but this time it was the class of alveolar stops, i.e., /t/ and /d/, which underwent palatalisation. Modern English has also witnessed the palatalisation of /t/ and /d/ in (both stressed and) unstressed syllables leading to more instances of affricate sounds.

Borrowing has been significantly involved in the phonological developments of affricates in all eras, but the importance of the role of borrowing varies according to the period. Among the three historical periods of English, it seems that loan words from French in Middle English made the greatest contribution to the phonological development of affricates, particularly by filling the gaps witnessed in the distributional pattern of affricates in Old English, e.g., the almost absence of the voiced affricate in word-initial positions. In Modern English, the role of borrowing with regard to affricates has been of less significant importance. Table 1 below summarises the effects of these two major causes of affricate development in the three periods of time under study here.

Table 1. The two major factors that led to the introduction of affricates in the three main periods in English

Factor	Period		
	Old English	Middle English	Modern English
Palatalisation	Palatalisation of /k/ and /g/	Palatalisation of /tʃ/ and /dʒ/	Palatalisation of /tʃ/ and /dʒ/
Borrowing	_____	From French(Heavy borrowing)	From other languages

A prominent feature of the orthographic development of affricates is the increase in the number of forms used to represent these sounds. Old English was characterized by the employment of a noticeably restricted

set of graphemes that signify affricates, whereas the set was enlarged in Middle English, and it has further expanded in Modern and present day English (as shown in Table 2 below).

Table 2. The orthographic forms that represent affricates by period and form

Period	Orthographic forms of /tʃ/	Orthographic forms of /dʒ/
Old English	*c, cc* (as long consonant)	*g,cg*
Middle English	*c,ch, cch, chch*	*g, gg, dg, j, i*
Modern and Present Day English	*c, ch, cz, si, te, ti, tch, t*	*g, j, ch, dg, di, dj, gg, gi, d*

Based on Table 2, two of the orthographic representations above have been in use in all periods, i.e., *c* for /tʃ/ and *g* for /dʒ/. Some forms, i.e., *cz*, are used in a strictly limited number of words.

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英語塞擦音的音韻及字形發展

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本文旨在探討英語塞擦音在音韻及字形上的發展。本文檢視了英語在歷史上三個主要階段的歷時發展。對於塞擦音的演進，古英語軟顎爆發音的顎音化及中古英語及現代英語舌尖爆發音的顎音化扮演了關鍵的角色。塞擦音的另一個來源則是在中古世紀從法語借來的外來詞。在古英語時期，兩種摩擦音的拼寫數量明顯少，到中古英語和近代英語時期數量才顯著上升。

關鍵字：塞擦音、古英語、中古英語、近代英語、音韻、拼寫