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TWENTIETH-CENTURY VARIETIES REFLECTING MEDIAEVAL SETTLEMENT IN NORMANDY: COMBINING MODERN AND HISTORICAL DIALECTOLOGY

Abstract

The article demonstrates how the methods of modern dialectology can be used together with established dialectological and toponymic findings to inform our understanding of present-day variation. The linguistic data used are from the 'Atlas Linguistique et Ethnographique Normand', whose data were collected in the 1970s, and in which many of the words given to researchers are probably Norman as opposed to French. The comparison of these data with the known settlement patterns of Vikings in Normandy in the ninth to eleventh centuries shows clearly that the Vikings' mediaeval settlement patterns are reflected in isoglosses which can be drawn based on the Atlas' twentieth-century data, and the statistics of the modern methods show how strong the correlation is.

1. The problem

In toponymic and historical studies of Normandy, France, the contribution of Viking invaders in the ninth to eleventh centuries is well-known. We know that Vikings began to invade the province in 840 and took control there in a series of steps starting in 911 (Neveux 1998; Le Fèvre 2000). Much research has demonstrated the traces they left in the form of place-names which to this day attest to a previous Scandinavian presence in Normandy. Such names are often formed using the name of a Viking landowner plus a common noun (*Rauville* < Hrolfr + Latin *villam* 'settlement'; *Quettetot* < Ketill + Common Scandinavian *topt* 'building plot'), or using Common Scandinavian nouns to describe the place (*Carquebut* < *kirkja* 'church' + *buth* 'house', 'village'; *Yquelon* < *eik*, a type of oak tree, + *lundr* 'grove'). Good overviews are provided by Adigard des Gautries (1954), Lepelley (1999a,b) and *The Viking Network*; more detail can be found in other works in the list of references.

The present article uses data from the *Atlas Linguistique et Ethnographique Normand* (henceforth *ALEN*: Brasseur 1980–2011), combined with toponymic and historical data, to examine the effect of the phonetics of the Viking invaders' language(s) on the speech of the *ALEN* informants (born in the late 19th and early 20th centuries). The examination will show that, at least in the areas of heaviest Viking settlement, the phonetics of Mainland Norman have much in common with the phonetics of the invaders' Scandinavian language. Since these common elements are still in evidence in *ALEN*, this article tests the hypothesis that patterns of language

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use can have influence on the phonetics of the vernacular hundreds of years after the original contact language has ceased to be spoken in the area in question. On the theoretical level, such influence indicates that our understanding of present-day variation can be informed by the historical phonology of both the language studied and the language which has been in contact with it, even if the two languages are no longer in contact. In the present case, the inventory of velar consonants of Old and Middle Scandinavian is very similar to the range of reflexes of Latin /ka-/ found in the parts of Normandy which are known to have been colonised by Anglo-Danes (Table 2), which have been chosen as an example to demonstrate the combination of traditional and modern techniques.

Many previous studies of the place-names of Normandy have produced maps of the names containing at least one probably Scandinavian element (*cf* Figure 4 below and, in the literature, Lepelley 1999a, 110ff and 1999b:45ff; de Beaurepaire 1969, 84; 1979, 13; 1981, 33; 1986, 43). The Viking place-names of Normandy and England have also been studied by historians for indications of the exact origins of the Viking colonisers of Normandy (Fellows-Jensen 1988, 1994). However, the distribution of place-names has not yet been directly compared with *ALÉN*'s data on pronunciations by 1970s inhabitants of Normandy, simply because the publication of the Atlas is more recent than many of the place-name studies. This article therefore takes the obvious opportunity to investigate what dialectology and toponymy can contribute to one another and to straightforward historical studies, using Normandy as an example. We find that, contrary to de Beaurepaire's assertion of 'pauvreté de legs linguistique' 'poverty of linguistic legacy' (2002, 48), the Vikings' linguistic legacy in Normandy may be considerable but of a subtler kind than the presence of words in the lexicon.

A word is necessary here about the presence of non-palatalised reflexes of Latin /ka-/ in parts of France other than Normandy. For the purposes of this article, the relevant other parts of France are Picardy and Pas-de-Calais, immediately North of Normandy (though there is also variable non-palatalisation of /ka-/ in the South of France). Vikings are not thought to have settled any of these areas extensively (Neveux 1998), and yet non-palatalised reflexes of Latin /ka-/ are found there.¹ In Picardy and Pas-de-Calais, the substrate language which is the most likely candidate to have contributed the lack of palatalisation of /ka-/ is Frankish, more specifically Old Low Franconian (James 1982, 31). By the eighth century, this part of Northern France was under a Frankish aristocracy in the Merovingian empire; it seems that

¹ For Picardy and Pas-de-Calais, see Pope 1952, §§301 and 1320, Gossen 1970, 95ff and Carton & Lebègue 1989-98; for the South of France, Anglade 1921, 161.

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ruling members of this aristocracy had to be bilingual, though ‘lack of evidence makes it exceptionally difficult to trace the process of language shift’ (Lodge 1993, 63; see also van der Wal & Quak 1994, 72ff). There is also comparatively little linguistic evidence about Frankish (compared to Scandinavian, at least). Considering the velar stops, reconstructions suggest that Frankish did not palatalise at least /g/ before /a/ (Alkire and Rosen 2010, 73), so it is at least possible that it did not palatalise /k/ before /a/ either, although we know that Old English, which is also West Germanic, did do so (van Kemenade 1994, 118). This article aims to use linguistic evidence from Normandy as a case-study to demonstrate what the techniques of modern dialectology can bring to historical linguistics, so this is not the place for detailed investigation of substrate influences in Picardy and Pas-de-Calais: the reader should simply bear in mind that the non-palatalisation of Latin /ka-/ in Normandy may well have originated from a substrate influence different from that in Picardy and the Pas-de-Calais, although the result was the same.

2. The area studied and the Norman language



Figure 1. The Norman domain: Normandy and the Channel Islands

The area studied here is known as the ‘Norman domain’ (Figure 1). Norman is the Romance variety once spoken all over the area, which covers mainland Normandy (see Figure 2 for more detail) and the Channel Islands: the largest of the Islands are Jersey, Guernsey (French *Guernesey*), Alderney (*Aurigny*) and Sark (*Sercq*).

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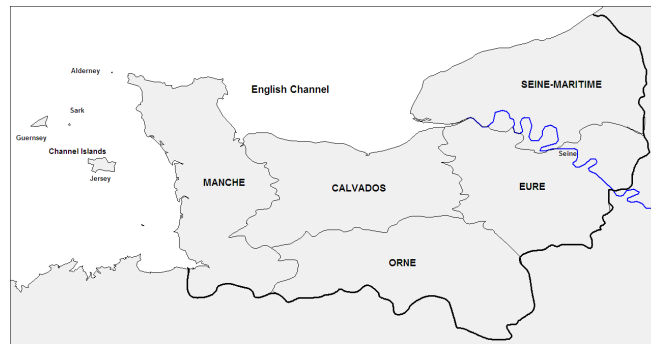


Figure 2. The five departments of Normandy

Opinions differ as to whether Norman is a dialect of French or a separate but related language: see Gordon (2005) and, *contra*, DGLFLF (2006).² Norman is the language responsible for the import of the great number of terms of Romance origin (popularly said to have come from French) which entered the English language before and after the Norman conquest in 1066. In mainland Normandy, Norman has in practice given way to French as the language of daily communication for all speakers. It is mainly maintained in the context of poetry and rural folklore demonstrations, and is spoken by very few people younger than seventy years old, though it is taught in a few small groups across Normandy. In the Channel Islands, Norman is extinct on Alderney and arguably almost extinct on Sark, but there is at least some consciousness of it still, and a few speakers, on Jersey and Guernsey, the two larger Islands (see Jones 2001 and references there). Though there is great regional variation from one end of the domain to the other, all varieties are mutually intelligible, and all are referred to in Normandy as *patois*.

3. The nature of the data

3.1 Linguistic data

This study examines the distribution of variants of the first phoneme (which can be a consonant or a consonant cluster) in *champ* ‘field’, *charrette* ‘cart’, ‘hay-wagon’, *charrue* ‘plough’ and *chat* ‘cat’ (Table 1). All these French words are reflexes of Latin words beginning with /ka-/. /ka-/ is used in this study because it is possibly the

² Délégation Générale à la Langue Française et aux Langues de France: ‘General Delegation on the French Language and the Languages of France’.

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| <i>Modern Standard French reflex</i> | <i>Etymon</i> |
|--------------------------------------|---|
| <i>champ</i> ‘field’ | < Latin <i>campum</i> |
| <i>charrette</i> ‘cart’, ‘hay-wagon’ | < Latin <i>carrum</i> + French diminutive suffix <i>-ette</i> |
| <i>charrue</i> ‘plough’ | < Latin <i>carrucam</i> |
| <i>chat</i> ‘cat’ | < Latin <i>cattum</i> |

Table 1. /k/-palatalisation data in this study

best-known phonological variant which is characteristic of historical varieties in Northern France: Pope 1952 §1320 puts it first in a list of Northern regional characteristics, for example, and gives it a more extensive note than any other such characteristic. It is also the best-attested such characteristic in *ALEN*, as there are four words which have a majority of Atlas responses which begin with a velar stop or some kind of palatal, *and* show enough variation to demonstrate the dialectological technique. As this article demonstrates a statistical technique, it was important that the dataset should be as big as possible; this was especially so given that *ALEN* is not principally a phonological atlas, but it was used here for a phonological purpose, there being no other coverage of any kind of dialectal variation in Normandy which covers the region in such detail. Other phonological features which we might have used to do the demonstration either could not be linked to Scandinavian influence (*e.g.* retention of initial /w/ where French now has /gw/, Pope 1952 § 192) or simply did not have enough data in *ALEN*.

Among these four words in /ka-/, *ALEN* distinguishes eleven reflexes for the first phonemes of the Latin etyma, ranging from /k/ to Standard French /ʃ/ to /tʃ/ (Table 2). However, no single word in this data-set exhibits all eleven reflexes, and some exhibit as few as two: the first phoneme of *champ* and *chat* is recorded only as /ʃ/ and /k/.

3.2 Toponymic data

The geographical distribution of variants for these first phonemes in the Norman domain is compared with the distribution of 781 place-names containing at least one probable Scandinavian element. The names have been taken from sources listed in the bibliography, mostly by Adigard des Gautries, de Beaurepaire and Lepelley.

A few remarks are necessary on the establishment of the list of ‘Scandinavian’ place-names (referred to as ‘Viking place-names’) used in this work. The methodology employed here (described in detail in §6.2) requires a defined list of such names in

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| <i>Map symbol</i> | <i>Degree</i> | <i>IPA</i> | <i>ALEN description</i> |
|-------------------|---------------|-----------------|---|
| ■ | 1 | k | voiceless velar stop (no palatalisation) |
| ▲ | 2 | k ^j | palatalised voiceless velar stop |
| ▲ | 3 | kɥ | voiceless velar stop plus palatal glide |
| ★ | 4 | k̟ ^j | fronted palatalised voiceless velar stop: Brasseur notates this palatalised consonant as between /k/ and /t/ |
| ★ | 5 | k̟ɥ | fronted voiceless velar stop (between /k/ and /t/) plus palatal glide |
| ★ | 6 | k̟ʃ | fronted voiceless velar stop (between /k/ and /t/) plus voiceless postalveolar fricative |
| ★ | 7 | ç | voiceless palatal fricative |
| ★ | 8 | ç< | fronted voiceless palatal fricative; the front matter of ALEN describes it as ‘un /ç/ particulièrement chuintant, comme dans le suédois <i>sju</i> ’: ‘a particularly hissing /ç/, as in Swedish <i>sju</i> ’ |
| ■ | 9 | ʃ | voiceless postalveolar fricative (Standard French) |
| ▲ | 10 | tç | voiceless dental stop plus voiceless palatal fricative |
| ▲ | 11 | tʃ | voiceless dental stop plus voiceless postalveolar fricative |

Table 2. ‘Degrees of palatalisation’ of the initial phoneme, for words used in this study³

order to be able to compare numbers of such names within and outside various isoglosses, comparisons which are made in §7. Many of the remarks which follow are caveats demonstrating why the list of Viking place-names here should not be taken as definitive, but instead as at least close enough to the truth to demonstrate this technique and reach conclusions which are unlikely to be overturned completely.

Most importantly, the Scandinavian elements in some names are only ‘probable’ because, in our current state of knowledge, it is difficult to decisively separate names that originated in what are now the different sub-families of the Germanic family. This is especially true given that the sub-families were less differentiated a thousand years ago than they are now. Nevertheless, the separation of the sub-families is a question of importance in the toponymy of Normandy, since

³ The scale of degrees of palatalisation is made by the present author and is based on frontness of the phones in the reflex, taking the backmost phone attested ([k]) as the starting-point. Transcriptions from Brasseur’s *ALEN* notation to IPA were made by the present author.

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mainland Normandy was populated at different times by tribes from what is now Germany (the Saxons from around the fourth century AD, and later the Franks), and by people from what is now Scandinavia (Vikings, starting in the ninth century AD). The problem is further complicated by the fact that at least some of the Viking invaders came to Normandy *via* what is now England, where they would have been exposed to yet another Germanic language, Old English.

As the languages of the Saxons and Franks, the languages of the Vikings and Old English had many roots in common, it is often difficult to separate names of Saxon or Frankish origin (often referred to in the literature simply as ‘Germanic’) from that particular movement within the Germanic family that was reflected in the (Anglo-)Scandinavian names. In the literature, roots which are either Old English or Scandinavian but cannot be assigned uniquely to one or the other are usually referred to as ‘Anglo-Scandinavian’; roots that are reasonably certain to have come from the Saxons or Franks are usually referred to as ‘Germanic’; and roots that certainly come from the Vikings are called ‘Scandinavian’. The difficulty involved can sometimes even lead to contradiction between two works by the same author: there are names which de Beaufort calls ‘Germanic’ or ‘Anglo-Saxon’ in one work and ‘Scandinavian’ in another. The origins of other names are the subject of motivated differences between authors: a good example is that of *Cherbourg*. It is agreed that the second element of the name comes from Germanic *burg* ‘fortification’, but the first element is the subject of controversy. The suggestion which seems to be backed with the most evidence (from other similar forms: Rivet & Smith 1979, 317ff) is that earlier **Coriovallum* / **Coriovalium* first became *Coriallum*, and then gained the Saxon or Anglo-Saxon element *-burg*. Other suggestions are that the first element of *Cherbourg* is from Scandinavian *kjars* ‘marsh (genitive)’ (Lepelley 1999b, 46), or that it is from an unknown Germanic (i.e. non-Scandinavian) root (de Beaufort 1986, 101).

In the face of uncertainties such as these - for which no-one can be blamed, since our practice in historical linguistics often comes down to ‘the art of making the best use of bad data’ (Labov 1994, 11) – I have tried as far as possible to include in my inventory of Scandinavian-derived names only those for which no author has shown any uncertainty as to their Scandinavian origin. As always, it is possible that a few names which are not Scandinavian, or a few whose derivation is uncertain, have slipped through the net and are included; likewise, a few genuine Scandinavian names may have been excluded because their similarity to another Germanic root has made some author think they were not Scandinavian. Such cases have hopefully been kept to a minimum.

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A further simplifying assumption which I have made is that names which contain an element which came originally from a Scandinavian common noun are in fact Viking in origin: the other possibility is that they are compounds created from the local reflex of the Scandinavian word *after* it had been adopted into the local language. Possible examples would include names in *-tot* or *-tôt*, which could come directly from Common Scandinavian *topt* or from *tôt* once that had been adopted into French, and names in *-tuit*, which could come directly from Common Scandinavian *thveit*, or from *tuit* after that had been adopted into French. It is often (maybe usually) impossible to tell when a word first came into a language or when a name first came into use, so, in order not to miss any possible Scandinavian influence and thereby understate its extent, I have included all of this kind of place-name as Viking place-names.

There is also the frequently unanswerable question of whether two place-names formed on the same personal name were formed on the name of the same person. If they were, a study which seeks to measure the density of Scandinavian population should use only one list-entry to cover both names, since between them they represent only one 'unit of population' – only one Scandinavian person. Unfortunately, in practice it is often impossible to prove whether two places with identical or similar names were founded by the same person, given the reasonably frequent recurrence of roots among the Scandinavian-derived names in Normandy, and given the lack of documentary evidence concerning the foundation of the places concerned. For example, the inventory contains eight places called Amfreville or Amfréville (< Scandinavian personal name *Asfrid(h)* + Latin *villam*: cf de Beaufreire 1986, 67 and Lepelley 1999b, 51). These places are spread over the whole Norman domain. We may assert that the Amfreville in the Manche department (in the West of Normandy) was probably not founded by the same person as Amfreville-les-Champs in the Eure department (East), since the two are 196 km (122 miles) apart as the crow flies. However, it is not clear how to separate cases where we may say that two similarly-named places were probably founded by the same person from cases where that is unlikely. If we designated a maximum distance that could lie between two places founded by the same person, that distance would be arbitrary. If we say that Amfreville (Manche) and Amfreville-les-Champs (Eure) were probably not founded by the same person because of the distance between them, can we say that Amfreville and Amfréville (both Manche) probably *were* founded by the same person? These two settlements are only 34 km (21 miles) apart and are not separated by any major geographical feature, though they are separated by many other settlements. And what, then, should we say of an intermediate case,

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that of Amfreville-les-Champs (Eure) and Amfréville (Calvados), which are 113 km (70 miles) apart?

In order to ensure as much consistency as possible in my records, unless it is proven beyond reasonable doubt that the same person gave his name to two similarly-named places, I have given the places separate entries in the inventory, no matter how close together they are. Therefore, Amfreville and Amfréville (Manche) have two separate entries; Amfreville-les-Champs and Amfreville-sous-les-Monts (Eure) have two separate entries; and so on. This procedure may result in slightly too many individual Viking place names being included in maps here, but the alternative solution ran the greater risk of undoubtedly omitting some settlements which deserved to be included. If this approach had been taken, the relative densities of Scandinavian settlement of the different parts of Normandy would not have appeared clearly.

Finally, following the same principle, I have generally given separate entries to names derived from the same common noun, unless we can be certain that the common noun in question refers to the same hedge, settlement or whatever. Again, this holds even if the two places concerned are close together. There are motivated exceptions: in some instances, the meaning of two place-names containing some of the same elements, or their precise physical placement with respect to one another, mean that we can be reasonably sure that one of the places was at one point carved out of the other. Two sets of examples will illustrate.

- **Routot and La Haye-de-Routot (Eure)** ‘Routot’ appears to be the result of a combination of Latin and Scandinavian roots – Latin *robur*, a type of oak, + Scandinavian *topt* ‘building plot’ - and in ‘La Haye-de-Routot’, *haye* has the sense ‘edge of a forest’ (de Beaurepaire 1981, 124; 1986, 134; cf Modern French *haie* ‘hedge’). Routot is still very near a forest, and is separated from it by La Haye-de-Routot, as stated by the name. My inventory therefore does not contain a separate entry for La Haye-de-Routot, because it was clearly originally dependent on Routot, as shown by de Beaurepaire.
- **Ectot** A number of places in the Norman domain bear names containing ‘Ectot’ (< Scandinavian *eski* ‘ash tree’ + *topt*), and they illustrate that the relations between places sharing name-elements are often not as clear as in the *Routot* example. It is likely that Ectot-l’Auber (Seine-Maritime) was so named in order to differentiate it from the settlement which is simply Ectot, only 6 miles away. The settlement Rue d’Ectot is also close enough (18 km / 11 miles away) to be so named because it was on the road to Ectot; but St-Germain-d’Ectot clearly does not refer to the same Ectot, since it is in Calvados, on the other side of Normandy.

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The irregular results of past place-name changes have also meant that, misleadingly for toponymists, La Haye-d'Ectot (Manche) has no nearby Ectot to depend upon and was never on the edge of such a place (*cf* Routot and La Haye-de-Routot). Rather, the present name was formed as an amalgam of two previous names of the same settlement, 'La Haye de Barneville' and 'Ectot', which seem to have been used interchangeably until the appearance of 'La Haye-d'Ectot' in 1341 (de Beaurepaire 1986, 134-5). Given the lack of certainty about which uses of 'Ectot' may originally have had the same referent and which a different one, all these Ectots have separate entries.

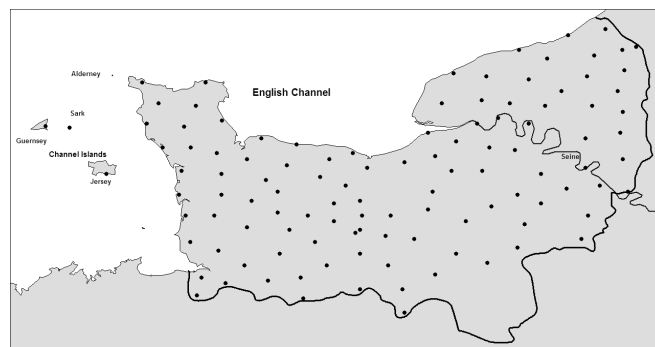


Figure 3. Survey-points for the *Atlas Linguistique et Ethnographique Normand* (N = 114)

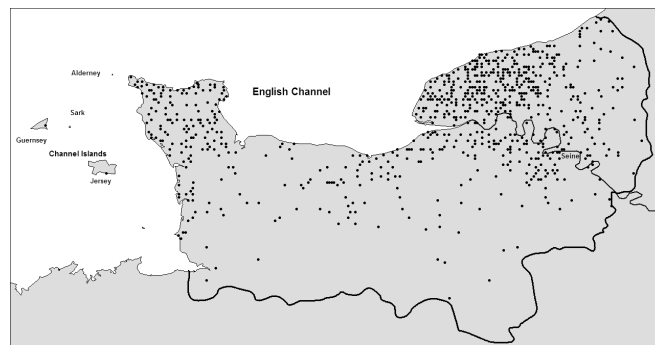


Figure 4. Place-names in the Norman domain containing at least one probable Scandinavian element ('Viking place-names') (N = 781)

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4. The linguistic background

4.1 Linguistic background: Norman

Jones (2001, 18) sums up the reflexes of Latin /ka-/ in Norman and in the French of Paris, ‘Central French’, the ancestor of Modern French: ‘Before [a], Latin [k] palatalised to [ʃ] in Central French, but no such development occurred in Norman. Hence, Latin CAMISIA ‘shirt’ > Standard French *chemise* [ʃəmiz], Mainland Norman [kmɛz]. This state of affairs is demonstrated by the *ALLEN* data for the words we are investigating. In general, reflexes beginning with [ʃ] are found in the South of the Norman domain, and the reflexes in the North begin with a plain velar stop [k], a palatalised velar stop [kʲ], a velar stop plus palatal glide [kɥ] or a fronted velar stop [k̟]. All the reflexes in the North of the domain have in common the fact that, if they have palatalised at all, they have not palatalised as far as Standard French [ʃ].

Though it does not affect the argument here, we should note in passing that the identity of the low front vowel which triggered this palatalisation of /k/ is not clear. Many authors have simply assumed that it was [a] (e.g. Pope 1952, §§182, 283, 298–301); however, recent research has suggested that it may have been [æ] (Buckley 2009). Whatever the precise identity of the reflex, the essential point is that it was a front vowel. /a/ can, of course, be considered a front vowel if the phonological vowel-space is seen as being an inverted triangle with /a/ at the bottom corner, but Buckley (2009) points out evidence from Old French assonance classes which shows that /a/ and /æ/ were separate. Whether the vowel in question was /a/ or /æ/, though, we can still say that palatalisation in Standard French reflexes of Latin /ka-/ was caused by a low front vowel which was a reflex of Latin /a/.

4.2 Linguistic background: Scandinavian

As in the changes from Latin to Norman, we find that in changes from Common Scandinavian to Old and then Middle Scandinavian, two developments of initial unvoiced velars before non-low front vowels are common:

| | | | |
|---|---|----|---|
| k | > | k | (no change) |
| k | > | kj | (a reflex which is primarily velar, with some palatalisation) |

Both developments are represented in the Middle Scandinavian of what is now Denmark (Haugen 1976, 261; 1982, 65).

Palatalisation of velars before /æ/ did take place later, ‘probably in the thirteenth century - in any case not much earlier’ (Noreen 1913, 150; my translation).

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If velars were palatalised before /æ/ in Scandinavian languages not much earlier than the thirteenth century, we can assume that any Vikings who invaded Normandy in the ninth and tenth centuries would have been speaking a dialect with no palatalisation in that environment, so that the presence of non-palatalised velar-stop reflexes of Latin /ka-/ in the areas where these people settled would not have been surprising. To make the story more precise, historical research does indeed show that the first Viking invaders of Normandy, in 840–911, were Anglo-Danes (Neveux 1998, 26).

In making this correlation of historical with linguistic facts I am not suggesting that the Viking invasions of Normandy were the *cause* of the non-fully-palatalised reflexes of Latin /ka-/, since they could equally well be the result of a Germanic substrate influence from the Franks in Normandy (*cf* §1 of this article). I am simply pointing out the facts that there are remnant non-palatalising areas in Normandy, and that they coincide well with areas where independent historical evidence shows that Vikings settled, and finally showing how the dialectological methods of Labov *et al* can be used to make this conclusion more secure.

5. The data from the *Atlas Linguistique et Ethnographique Normand*

The *ALÉN* distributions of reflexes for the four words considered in this paper are shown in Figures 5-8.

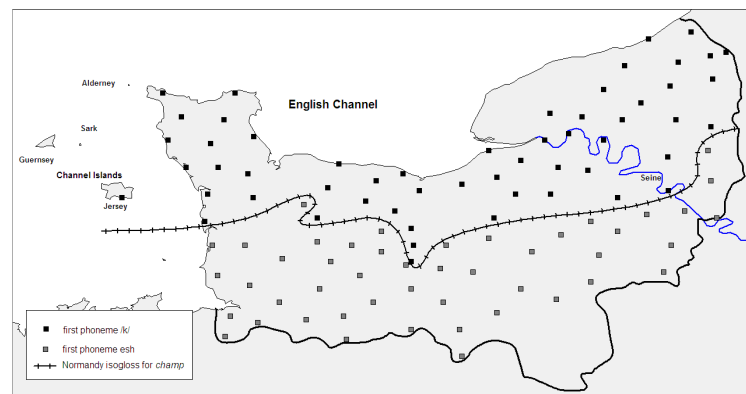


Figure 5. *ALÉN* reflexes in *champ*⁴

⁴ Typographical limitations have prevented the inclusion of IPA characters in the legends on the maps themselves. The symbols used in the maps have therefore been included in Table 2.

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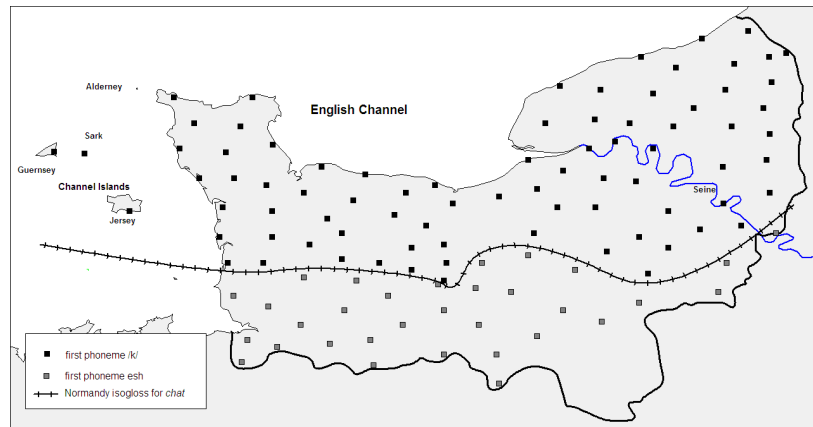


Figure 6. ALEN reflexes in *chat*

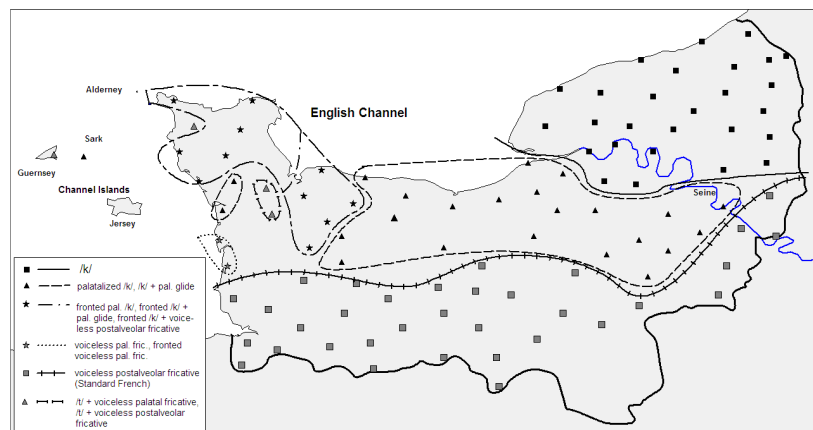


Figure 7. ALEN reflexes in *charrue*⁵

In the map legends, ‘esh’ = /ʃ/; other sounds are described by their articulations. The abbreviations used are: ‘pal.’ = ‘palatal’; ‘fric.’ = ‘fricative’.

⁵ On the isogloss which cuts the larger ‘fronted palatalized /k/, fronted /k/ + palatal glide, fronted /k/ + voiceless postalveolar fricative’ isogloss in two (North-West Normandy), see §7.1.

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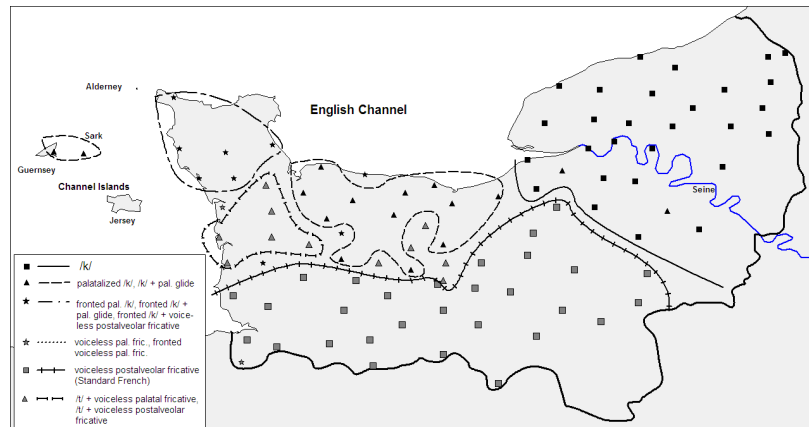


Figure 8. *ALEN* reflexes in *charrette*

Mere visual inspection of these maps shows that all four words have primarily-velar reflexes in the North of Normandy, where history tells us that the Vikings did settle. By ‘primarily-velar reflexes’ I refer to the reflexes containing at least some variety of velar stop, [k k^j k^ɰ k^j k^ɰ k^ɰ], as opposed to those whose first phone is further forward. The precise figures for these reflexes in these words are shown in Table 3.

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| | /k/ | | /k ^j kʲ k̟ ^j k̟ʲ k̟ʃ/ | | Total | |
|------------------|----------|----|---|----|-------|----|
| | N | % | N | % | N | % |
| <i>champ</i> | 55 / 103 | 53 | 0 | 0 | 55 | 53 |
| <i>chat</i> | 81 / 114 | 71 | 0 | 0 | 81 | 71 |
| <i>charrue</i> | 27 / 102 | 26 | 37 | 36 | 64 | 62 |
| <i>charrette</i> | 28 / 95 | 29 | 25 | 26 | 53 | 55 |

Table 3. *ALEN* figures for primarily-velar reflexes for words used in this study.

Table 3 contains four rows, one for each Norman word considered in this study. In each row are three columns: number and proportion of reflexes beginning with plain /k-/, number and proportion of reflexes beginning with some variety of palatalised velar (/k^j kʲ k̟^j k̟ʲ k̟ʃ/), and total number and proportion of primarily-velar reflexes (the sum of the previous two columns). None of the four words have all their *ALEN* reflexes accounted for in this table; the remainder are made up of reflexes beginning with a palatal, /ʃ/ - so, for example, for *champ*, a total of 55 respondents out of 103 (= 53%) produced a response beginning with one of /k^j kʲ k̟^j k̟ʲ k̟ʃ/, and the remainder (48 out of 103, 47%) produced a response beginning with /ʃ/.

The total N for each word is different in Table 3 because the table only counts answers which are etymologically related to the Latin etyma listed in Table 1 (which are the etyma of the Standard French words for these concepts). All *ALEN* answers which are etymologically related to these Latin and French words begin with a velar, a palatal or similar; but, for the words considered here, not all respondents gave answers which were etymologically related in this way. An example of another alternative is that a question designed to elicit *champ* 'field' could, in Normandy, equally well elicit *pièce* or *clos*, not etymologically related to Lat. *campum*. Answers

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like this, where there is no possibility of a palatal(ized) reflex (as there is no way to palatalise /p/ or /kl/), were not included in the N's for the word in question. So, to use the word *champ* as an example of how to interpret this table: as there were a total of 114 survey-points in *ALEN*, we can see that the respondents in 11 survey-points (= 114-103) produced a word like *pièce* or *clos*, which are not etymologically related to Lat. *campum*; the other 103 answered with something like [kã] or [ʃã], giving an answer which was clearly etymologically related to *campum*.

The only question where all respondents *did* produce an etymologically-related answer was the question designed to elicit Standard French *chat* 'cat' – for this word, all respondents either said [ka] or [ʃa].

Thus far, then, we can see that the findings of dialectology and those of historical research in Normandy coincide in a promising way, since the primarily-velar Norman reflexes of Latin words beginning with /ka-/ are found in areas where Vikings settled, and would have spoken languages which had primarily-velar reflexes of Common Scandinavian /ka-/. The combination of place-names and data from *ALEN* therefore provides, from another quarter, independent evidence about exactly who invaded which parts of Normandy.

6. Combining two kinds of data

6.1 The combination of *ALEN* data and place-names

The *Atlas Linguistique et Ethnographique Normand* data and the toponymic data are compared here by superimposing isoglosses drawn from *ALEN* data (Figures 5-8) on the map of Viking place-names (Figure 4). Descriptive statistics are used to demonstrate the likelihood of a relationship between the locations of the Viking place-names and the precise phonetics of the reflex of Latin /ka-/ found in those locations. Of course, isoglosses (especially at this level of phonetic differentiation) are not fixed in the locations where they happen to have been drawn; that is, we know that the isogloss needs to divide point A from point B, but whether it lies closer to point A or to point B on any particular map is often not a result of dialectological research so much as a hazard of cartography. (The exceptions are where some geographical feature – a road, river or mountain range – can be shown to be responsible for the divergence of forms, in which case the isogloss can be said to coincide with that feature.) In this article, the exact placement of the isoglosses between any two points is often determined simply by the line-smoothing algorithm in the mapping program used (MapInfo). This means that, as geographical markers, the locations of the isoglosses used here are by definition less precise than the locations of the settlements they are being compared with; but we will see that a high degree of statistical precision can still be achieved.

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The likelihood of a relationship between the locations of the Viking place-names and the precise phonetics of the reflex of Latin /ka-/ found there is best demonstrated by the *ALEN* data for *charrue* ‘plough’ and *charrette* ‘cart’, because these data show the greatest number of different reflexes attested. From previous studies, both linguistic and not, we already know fairly precisely where in Normandy the Vikings settled, so, in themselves, the following statistics do not necessarily make that argument any stronger; but what they do do is demonstrate a dialectological method which has not so far been used in historical linguistics, and which will – we hope – be useful in other similar studies, where we may indeed need more solid proof of a relationship between historical settlers and more recently attested linguistic forms.

6.2 The statistics

The Pearson product-moment correlation coefficient (r) and its associated one-tailed probability are used to compare the list of areas of the isoglosses drawn on the map for each word with the list of numbers of Viking place-names to be found within those isoglosses. Subsequently, a relatively novel measure, the measure of consistency of isoglosses introduced in the *Atlas of North American English* (Labov, Ash & Boberg 2006, 41ff), is used as a simple demonstration of the distribution of Viking place-names in Normandy. For the purposes of this study, we need to define two types of consistency – linguistic and toponymic – but only toponymic consistency will ultimately be of interest,

- Labov, Ash and Boberg’s original definition of ‘consistency’ was ‘total hits within the isogloss divided by total hits’ (within and outside the isogloss); it is usually used to measure how many of the occurrences of a certain linguistic variant occur within the isogloss that has been drawn for that variant, and this is what we will refer to here as ‘linguistic consistency of an isogloss’. For all the etyma in this study, the linguistic consistency of all isoglosses is at or close to 1; that is, the isoglosses contain all or nearly all of the points where the relevant variant was produced. The linguistic consistency of isoglosses here (as opposed to the toponymic consistency measured by the percentage of the 781 Viking place-names which falls within each isogloss) will therefore not be referred to any further in this article.
- We will also define ‘toponymic consistency’, where a ‘hit’ will be a Viking place-name, so that the consistency of Viking place-names for an isogloss will be the number of Viking place-names found within that isogloss divided by the total number of Viking place-names used in the study (781). The principal isoglosses of interest for this measurement will be the ones which represent

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primarily-velar reflexes of Latin /ka-/ (similar to the Vikings' Middle Scandinavian reflexes of Common Scandinavian /kæ-/: see Table 3 above).

Though the consistency statistic is less precise than the test for Pearson's product-moment coefficient, it can be calculated for all four of the words in this article's sample; Pearson's test cannot be carried out for *chat* and *champ* because each shows only two variants in *ALEN* ([ʃa] and [ka] for *chat* and [ʃã] and [kã] for *champ*). Labov, Ash & Boberg (2006, 48) also introduce the measure of homogeneity of an isogloss, defined as 'total hits within the isogloss divided by total speakers within the isogloss'. Homogeneity is then 'a measure of how much variation exists within the region defined by the isogloss'. If we were again to redefine 'hit' as a Viking place-name and 'speaker' as any place-name (because, in the original terminology, 'hits' are 'speakers' who use a certain linguistic variant), then, in order to measure the homogeneity of Normandy's place-names, we would have to have a full inventory of all its place names of any origin. Needless to say, this would result in a considerable expansion of this article's inventory of Viking place-names. The homogeneity of an isogloss would then be the number of Viking place-names within the isogloss divided by the total number of place-names within it. Such a project would be very desirable but also very lengthy, and we leave it for the future.

7. Results

7.1 Charrue

(*cf* Figures 7 and 9.) A Pearson's test of the number of Viking place-names in each isogloss against the isoglosses' areas in square miles produces $r = 0.363$, one-tailed $p = 0.24$. If we cut the 'fronted palatalized /k/, fronted /k/ + palatal glide, fronted /k/ + voiceless postalveolar fricative' – [kʲ kʲ̥ kʲ̥ʰ] – isogloss so that it does not encroach on the Calvados department but only covers part of the Manche department, where most of its Viking place-names lie, the statistics very slightly improve: $r = 0.366$, one-tailed $p = 0.238$. The figures for this restricted area are shown in parentheses in Table 4. If these probabilities had been equal to or below 0.05, we could have said that a relationship between the number of Viking place-names within an isogloss and its area was significantly likely. As it is, all we can say is that we cannot rule out the possibility that the distribution of the Viking place names is related to the distribution of the linguistic variants mapped. The correlation is positive: that is, as the area of an isogloss increases, so does the number of Viking place-names it contains, but a strong positive correlation is ruled out by the small number of Viking place-names

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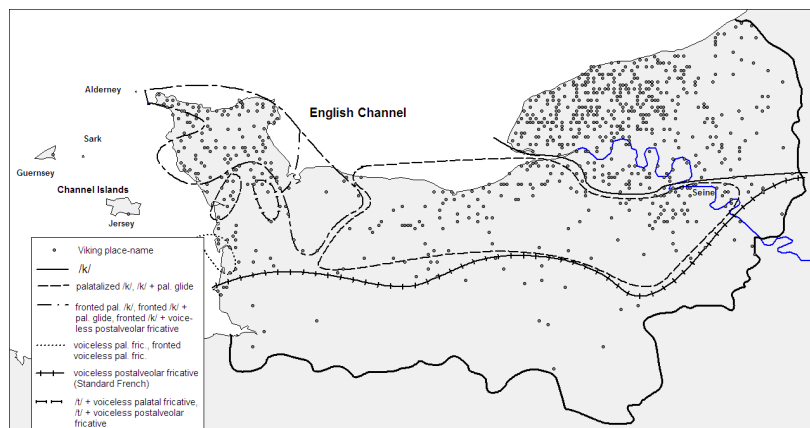


Figure 9. ALLEN reflexes and Viking place-names for *charrue*

contained within the largest isogloss (voiceless postalveolar fricative – [ʃ]). Apart from this exception, visual inspection of Table 4 shows that the area of isoglosses does tend to increase with the number of Viking place-names they contain, so a weak positive correlation is an encouraging result for this study. Using current methods, it is impossible to exclude the [ʃ] isogloss and test the significance of the correlation for the others (expecting it to be higher), because the test for significance of a correlation coefficient requires the rank orders tested against one another to have at least $N=6$ (Lowry 2000-2007); excluding the [ʃ] isogloss would reduce the rank orders tested to $N=5$.

A positive indication of a correlation between the location of Viking place-names and primarily-velar reflexes of Latin /ka-/ is given by the consistency statistics, which are of course simply the percentage of total Viking place-names found within each isogloss. As these statistics demonstrate, 85.8% of the Viking place names of Normandy are contained within isoglosses representing a primarily-velar reflex of /ka-/ in *charrue*; these isoglosses cover 52.7% of the area of Normandy. If we again restrict the [kʲ k̟ k̠] isogloss to the part of it covering the Manche department, as above, we see that 84.6% of the Viking place-names of Normandy are still contained within a primarily-velar isogloss, and the isoglosses

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| | N | % of total Viking place names | Area /mi ² | % of area of N'dy |
|--|-------|-------------------------------|-----------------------|-------------------|
| Viking place-names South of [ʃ] isogloss | 28 | 4% | 4248 | 36.8% |
| Viking place-names North of [k] isogloss | 429 | 55% | 2721 | 23.6% |
| Viking place-names in [kʲ kʷ k̥] isogloss | 96 | 12% | 896 | 7.8% |
| Viking place-names in [kʲ kʷ] isogloss | (87) | (11%) | (529) | (5%) |
| Viking place-names in [tʃ tʃʰ] isogloss | 145 | 19% | 2465 | 21.3% |
| Viking place-names in [tʃ tʃʰ] isogloss | 6 | 1% | 75 | 0.6% |
| Viking place-names in [ç ç<] isogloss | 6 | 1% | 50 | 0.4% |
| N | 701 | | | |
| ----- | | | | |
| Total Viking place-names in [k kʲ kʷ k̥ k̥ʲ] isoglosses (primarily-velar variants) | 670 | 85.8% | 6082 | 52.7% |
| (with [kʲ kʷ k̥ʲ] isogloss restricted to Manche) | (661) | (84.6%) | 5715 | (49.5%) |

Table 4. Distribution of *ALÉN* reflexes and Viking place-names for *charrue*⁶

concerned now cover only 49.5% of Normandy. The greatest concentration of Viking place-names within a single isogloss is that 54.9% of them are North of the [k] isogloss, in an area covering only 23.6% of Normandy.

⁶ The total N (701) does not equal the total number of Viking place-names on the map (781) because the remaining 80 places did not fall within an isogloss. For the same reason, the total area of the isoglosses does not equal the total area of Normandy (11,547mi²).

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An example of how the statistical tests treat the data in Table 4 is as follows. The first statistical test used compares rank orders – that is, it compares the order of the numbers in different columns of Table 4: the numbers of Viking place-names contained by each isogloss (429, 145, 96, 28, 6, 6), compared with the order of the areas contained by each isogloss in square miles (4248, 2721, 2465, 896, 75, 50), and so on. If these two rank orders do not put the isoglosses in the same order (for example, if the isogloss containing the most Viking place-names is the one for [k], but the one containing the greatest area is the one for [ʃ]), this will indicate that the density of Viking place-names is not uniform across Normandy (which we knew), but the test statistic will give us a precise statistical indication of the extent to which there is a concentration of names in some areas and a relative sparseness of names in other areas.

7.2 *Charrette*

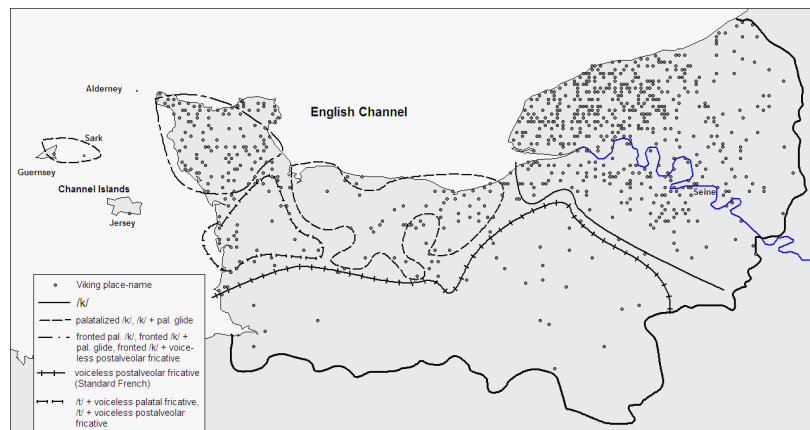


Figure 10. ALEN reflexes and Viking place-names for *charrette*

(*cf* Figures 8 and 10.) A Pearson's test of the number of Viking place-names in each isogloss against the isoglosses' areas in square miles produces $r = 0.547$. This correlation is considerably higher than that for *charrue* (which was $r = 0.363$), suggesting that there is a strong positive correlation between the distribution of the Viking place-names and the distribution of the linguistic variants mapped. For this test it is impossible with current methods to test for statistical significance because

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| | N | % of total Viking place names | Area/mi ² | % of area of N'dy |
|---|-----|-------------------------------------|----------------------|----------------------|
| Viking place-names | | | | |
| South of [ʃ] isogloss | 24 | 3.1% | 4268 | 37% |
| Viking place- names North of [k] isogloss | 526 | 67.3% | 4226 | 36.6% |
| Viking place- names in [kʲ kʲʲ] isogloss | 94 | 12% | 594 | 5.1% |
| Viking place- names in [kʲ kʲʲ] isogloss | 45 | 5.8% | 1018 | 8.8% |
| Viking place names in [tʃ tʃʲ] isogloss | 28 | 3.6% | 454 | 3.9% |
| N | 717 | | | |

Table 5. Distribution of *ALEN* reflexes and Viking place-names for *charrette*

only five isoglosses could be drawn for *charrette* – the significance test would have needed at least six isoglosses to be drawn. However, the higher *r* value for *charrette* than for *charrue* shows on its own that the positive correlation between the area of isoglosses and the number of Viking place-names they contain is stronger; again, the correlation is prevented from being very strong by the relatively small number of Viking place-names contained within the largest isogloss (voiceless postalveolar fricative – [ʃ]).

The consistency statistics for *charrette*, also contained in Table 5 (as the percentage of total Viking place-names within each isogloss), give another convincing demonstration that there is a correlation between the location of Viking place-names and the location of isoglosses for primarily-velar reflexes of Latin /ka-/. These statistics show that 85.1% of the Viking place-names are contained within an isogloss representing a primarily-velar reflex in *charrette*; these isoglosses cover only 50.6% of Normandy. This concentration of Viking place-names within the isoglosses covering reflexes also found in Middle Scandinavian is very similar to the

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concentration for *charrue*, though there is no statistical test to show exactly how similar. The greatest concentration of Viking place-names within a single isogloss is that 67.3% of them are North of the [k] isogloss, in an area covering only 36.6% of Normandy. This concentration is, of course, in the same area as the greatest concentration of Viking place-names for *charrue*. The [k] isoglosses for both words contain the present-day department of Seine-Maritime, and in particular contain the Pays de Caux (popularly thought of as having a strong local dialect, at least up to the time when the informants for *ALEN* were interviewed: cf Bulot 2006:34ff, Schortz 1998:25ff). The [k] isogloss for *charrette* also contains the Northern half of the Eure department.

The crucial point in this comparison of percentages is, then, that the combination of high percentages of Viking place-names with low percentages of the area of Normandy in which they are found shows that the Viking place-names are concentrated in certain areas of Normandy – and, where it is possible to calculate it, the *r* statistic shows us the exact nature of the correlation between areas and percentages of Viking place-names.

7.3 *Champ and chat*

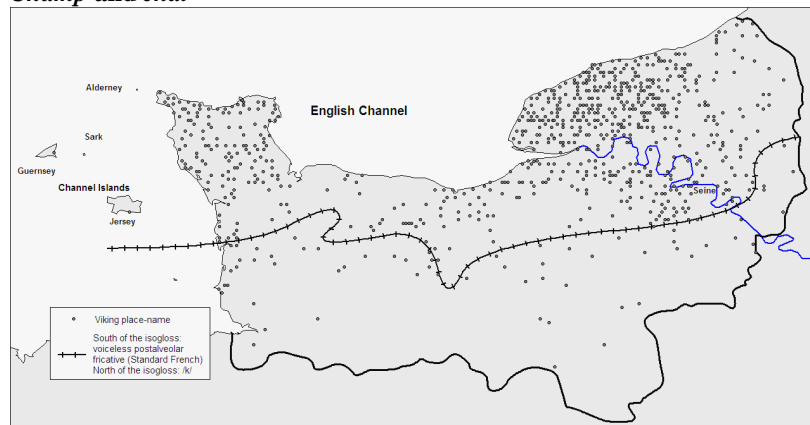


Figure 11. *ALEN* reflexes and Viking place-names for *champ*

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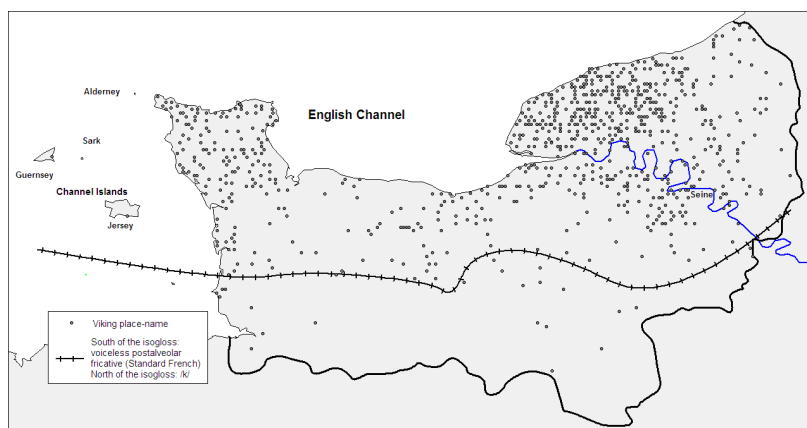


Figure 12. *ALEN* reflexes and Viking place-names for *chat*

As is mentioned above, *champ* and *chat* each have only two variants for the first phoneme in *ALEN*: [k], found in the North of Normandy, and [ʃ] found in the South. The isogloss separating the two forms also separates the area of Viking colonisation from the area of no colonisation very well. The consistency of Viking place-names North of the isogloss for *champ* is 0.92 – so 92% of the Viking place-names are in the area where *champ* is pronounced with a plain velar consonant – and the consistency of Viking place-names North of the isogloss for *chat* is 0.97. These words are not the most convincing demonstration of a Scandinavian-type reflex in the area where the Vikings settled, since each word has only two reflexes, but they do not go against the principle established by *charrue* and *charrette* that the Scandinavian-type reflexes are to be found in the areas where Vikings settled.

8. Conclusion: data from *ALEN*, place-names and the maintenance of isoglosses

Lepelley (1974, xxix) and Lechanteur (1952, 71) call attention to the correspondence between the settlement patterns of Vikings across the whole of Normandy, on the one hand, and the linguistic patterns in the parts of Normandy where they are known to have settled most heavily, on the other. For the reflexes of Latin /ka-/, this article has demonstrated that correspondence; it has particularly related the Normandy reflexes of Latin /ka-/ with the Middle Scandinavian reflexes of Common Scandinavian /k-/ that are found in what is now Denmark. Since we know from other research that the Vikings who settled in those areas were Anglo-Danes, at least in part, we may be permitted to connect the Danish origin of the people with the

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linguistic coincidence between the language of Denmark and the language of Normandy.

The case should not be overstated. We cannot, of course, deny that in many instances a combination of physical barriers of some description (probably rivers) and former boundaries of another type (political, ecclesiastical or administrative) is likely to be responsible for the position of isoglosses as drawn from *ALEN* data; and these political, ecclesiastical or administrative boundaries are likely to be less than 300 years old. The most prominent example is the coincidence of the natural boundary of the Thar, a river in South-Western Normandy, and the ecclesiastical boundary of the border between the Diocese of Coutances and the Diocese of Avranches; this ecclesiastical boundary only disappeared when the dioceses were merged in 1802 (Goyau 1908), even though it may first have been established by the Franks, and of course the river did not disappear. Another candidate for a boundary along which the isogloss could have been formed is the road from Granville to Villedieu-les-Poêles: the towns may well have been founded when Normandy was still under Viking rule, but the road is still there.

Nevertheless, some limits which were never formalised and do not coincide with any other limit appear to have survived in the form of isoglosses for up to 1100 years. This can be seen in the case of /k/ > [kʲ k̟ k̠] (the ‘fronted palatalized /k/, fronted /k/ + palatal glide, fronted /k/ + voiceless postalveolar fricative’ isoglosses in Figures 7 and 8): they coincide well with areas which were relatively heavily settled by Scandinavians, particularly in the Cotentin peninsula (North-West). Those areas may never have been formally demarcated, since they were simply parts of larger areas which were granted to Viking rulers in the tenth century. Other parts of the same granted areas are likely to have been mainly Romance-speaking. This can be seen by comparing the dates of grants of Norman territory to Vikings with the extent of Scandinavian settlement of Normandy (as shown by the density of Viking place-names, in this article, and by other historical research). Although most of Normandy was under Viking control by the mid-tenth century, and all of it by the mid-eleventh century, far from all of the province was actually populated by Scandinavians. Nevertheless, the areas where Viking settlement was relatively dense, as shown by toponymic and historical research, are clearly reflected in the isoglosses drawn from *ALEN* data some 1100 years later. This is shown particularly clearly by Figures 7 and 8 in this article, and the associated statistical tests (§§5-6). It is to be hoped that the statistical methods shown here, first used in the *Atlas of North American English*, can be further used in historical-dialectological work in future, as this study shows they have much to offer in that sphere as well as in modern dialectology.

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Acknowledgements

Versions of this paper have been presented at the Twelfth International Conference on Methods in Dialectology (Université de Moncton, NB, Canada, August 2005) and at a meeting of participants in the Projet “Phonologie du Français Contemporain” (Université de Toulouse II – Le Mirail, France, March 2007). I am grateful to both audiences for their comments, and to Jacques Durand for the invitation to present the work in Toulouse. My thanks also go to Mari Jones, Stéphane Lainé, Peter Trudgill and three anonymous reviewers for comments on the work.

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This is a pre-publication version of an article which has been accepted for publication and will appear in *Acta Linguistica Hafniensia* before the end of 2012.

Please quote only from the final published version.

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