The Nasal Vowels of Wallonia

Daniel Ezra Johnson

This study is dedicated to
the memory of four linguists:
Yakov Malkiel (1914-1998) and
William G. Moulton (1914-2000)
who had long and successful careers
Willem Andries de Ruijg (1907-1945)
and Johann Joseph Marichal (1880-1915)
whose promising careers were ended by war

INTRODUCTION

The nasal vowels of the Romance dialects of Wallonia (southern Belgium) make a good topic for geographic investigation for two reasons. In the first place, if one tried to map another vocalic subsystem, such as the long or short vowels that most of these dialects have, one would have to study a small area, or else differences in phonemic incidence would become overwhelming. While the phonemic inventory and pattern of two dialects might be similar, or even identical, many word classes would be short in one area, long in another; and others, vice versa. It would be quite difficult to create diagrams analogous to the one Moulton (1968:580) draws 'to account for the development of every MHG phoneme and for the source of every modern phoneme' of several Swiss German dialects. With the nasal vowels, there is a more limited set of possibilities. While other word classes have evolved in many ways, yielding a host of different possibilities, a nasal vowel in any dialect always derives from an etymological VN (vowel plus nasal consonant).

Secondly, interesting variation among nasal vowels has already been reported by several investigators in different parts of Wallonia. In previous studies—each of a single locale—researchers have described systems with zero, two, three, four, and five nasal vowels (and one has reported a system of six nearby). Each recent decade has seen one or two detailed phonological descriptions published, but no one to our knowledge has attempted to use the *Atlas Linguistique de la Wallonie (ALW)* to carry out a study of more breadth, if of less depth. When Lechanteur (1973:162) called for the development of a 'geographic phonology,' he suggested that the best regions for sampling and field study could easily be determined by studying the *ALW*—of which he was then the director—implying that the atlas data by itself was not sufficient. The current director agrees, stating flatly, 'L'*ALW* ... ne permet pas d'établir les systèmes phonologiques des parlers belgoromans.' [The *ALW* ... does not allow one to establish the phonological systems of Belgo-Romance speech.] (Boutier, p.c.)

We hope to show that for the examinations of a reasonably constrained subsystem, atlas data can yield valuable results, despite the absence of the minimal pairs which constitute proof in classical phonological descriptions. In some parts of the territory, the *ALW* gives a very clear picture of the nasal vowel system; in other areas, it only raises questions for future study, exactly as Lechanteur predicted.

THE EVOLUTION OF THE FRENCH NASAL VOWELS (Figures 1-3)

It helps to see the nasal vowels of Wallonia in the context of the nasal vowels of French, whose history has been discussed in the literature. Scholars agree on many aspects of their development. It is clear, for example, that all vowels developed nasalized allophones before nasal consonants. However, these did not become phonemes in their own right until final nasal consonants were lost, a process completed no earlier than the

16th century. For most of their evolution, then, the nasal vowels underwent the same changes as their non-nasal counterparts.

There were seven vowels in Vulgar Latin (i, e, ɛ, a, ɔ, o, u), and they developed differently in open and closed syllables. Vowels in open syllables (VCV) lengthened, most of them diphthongized, and some of these later changed back into monophthongs (though not necessarily the same ones they had derived from). Vowels in closed syllables (VCC) were more stable, and before nasal consonants there was a neutralization of the pairs ɛ/e and ɔ/o. Because there was no diphthongization of high vowels, their development was the same in open and closed syllables. Therefore, ignoring words where the presence of yod [j] caused other changes, there were ten major word classes which evolved into nasal vowels: **iN**, **eNV**, **ɛNV**, **aNV**, **ɔNV**, **oNV**, **uN**, **e/ɛNC**, **aNC**, **o/ɔNC**.

While accepting these as the maximal set of relevant word classes, scholars have long disputed the details of their evolution. One point of doubt is when the allophonic nasalization began. The most traditional view (Figure 1) holds that it happened during the Old French period (10th-13th century), and that low vowels and front diphthongs nasalized well before back diphthongs, and high vowels nasalized latest of all. This ordering was supported by one interpretation of the textual evidence, and was also seen as the manifestation of a universal tendency. High nasals were judged to be unnatural and difficult to articulate; that the high vowels lowered upon nasalization was only natural. This view, sometimes known as the 'lowering hypothesis', represents the received opinion of French historical phonetics (Bourciez 1921, Dauzat 1964, Bonnard 1975).

Though others had opposed the lowering hypothesis from its inception, Rochet (1976) attacked it with a combination of methods. He used cross-linguistic evidence to show that there was nothing unnatural about high nasal vowels. Rochet also reanalyzed the textual evidence from Old French (which is based on poetic assonance) and concluded that all vowels had probably nasalized at the same time.

Note that the Old French period is the stage that was frozen in spelling. Except for the low back vowels, and with some individual exceptions, the orthography can be matched up one-to-one with the word classes: **iN** is spelled *in;* **eNV**, *ein;* **ɛNV**, *ien;* **aNV**, *ain;* **ɔNV**, **oNV**, *on;* **uN**, *un;* **e/ɛNC**, *en;* **aNC**, *an;* **o/ɔNC**, *on*. This is despite the following later changes in pronunciation:

Change 1) **eNV** and **aNV** monophthongized and both became [ɛ̃];

Change 2) **ɛNV** shifted from [íɛ̃] to [iɛ́̃] to [jɛ̃]; it was then reanalyzed as [j]+[ɛ̃], the latter being the same as the reflex of **eNV** and **aNV**.

Change 3) **iN** lowered to [ɛ̃] and also fell in with **eNV/aNV**;

Change 4) **e/ɛNC** lowered to [ã] and fell in with **aNC**.

Scholars agree on the relative chronology of 1, 2, and 3 occurring in that order, but where to place 4 is disputed. As far as the absolute chronology is concerned, there is also widespread disagreement. On the traditional 'lowering hypothesis' view (Figure 1), the vowels 'fell' into place by the 14th century, and the subsequent changes—loss of final nasal consonants resulting in phonemicization of nasal vowels; denasalization of nasal vowels before surviving nasal consonants; backing of /ã/ to /õ/—while important, did not affect the incidence of nasal vowels. (A more recent change not mentioned by any of these sources, where /ɛ̃/ replaces /œ̃/ via lexical diffusion, does alter the incidence.)

However, there is plenty of conflicting and difficult evidence from French orthoepists, grammarians, and literary works to suggest that these changes occurred at different times in the speech of different social classes in Paris, and that their final implementation was delayed at least until the dates indicated on Figure 2.

Change 1: '[**eNV**] and [**aNV**] were in the process of merging in the thirteenth century. In the sixteenth century ... the merger was complete.' (Rochet 1976:101).

Change 2: It appears that the lower social classes completed the stress shift and reanalysis of the diphthong descended from **ɛNV** soon enough that it joined **e/ɛNC** in Change 4, as attested by spellings like *bians* instead of *bien* for BENE (107). By 1700, though the pronunciation [jɛ̃] of the upper classes prevailed (Bourciez 1921:68).

Change 3: '[L]owered variants of *iN* may have existed as early as the end of the 13th century ... in the 16th century there is growing evidence that *i* in *iN* is no longer a high vowel ... by the end of the 17th century or the beginning of the 18th, the merger [of **iN** with **aNV/eNV**] was complete.' (104)

Change 4 is the most contentious of all. At first glance, its status seems to have vacillated strangely. To simplify greatly, in the hagiographic poems of Early Old French (850-1100), the two word classes do not form assonances with one another. Then, in the Late Old French *chansons de geste* (1100-1300), they do. Examining the earliest rhymed poetry, from 1200-1500, one finds that the word classes are kept separate; they do not rhyme. Finally, overt reports of the word classes being pronounced the same come from the 16th century, and by the 17th century the process seems complete (Rochet 1976:94-6). What to make of this? Some have argued that the Late Old French evidence represents speech, and that the newer rhyming poets preserved a tradition of distinction which they did not have in their speech. Another view is that the confusion did begin that early and did end that late, with different social classes maintaining it for different lengths of time, with the help of contact with dialects that kept the words separate? A third possibility is that no one pronounced them exactly alike in the Old French period; the *jongleurs* (who composed the *chansons de geste*) had less rigid rules than the rhyming poets, and they could have used **aNC** and **e/ɛNC** in assonance simply because they were close, not because they were the same.

A fourth variant of the history of Change 4 is that a qualitative distinction was lost rather early, but a quantitative distinction was maintained (Martinet 1965:119). In the varieties of Modern French that still preserve a distinction between [a] and [ɑ], the product of denasalization (before retained nasal consonant) of **aNC** is often [ɑ], while that of **e/ɛNC** is always [a]. An example is *femme* [fam] (< FEM(I)NA) 'woman' vs. *flamme* [flɑm] (< FLAMMA) 'flame'. Martinet's interpretation is that at the time of denasalization (16th century), these were distinguished as [fam] vs. [flãːm] (the quantitative difference later becoming a qualitative one).

Rochet (1976:97-101) gives seven counterexamples where **aNC** yields [a]; while most of these are problematic—*cabane* 'cabin' is a borrowing from Provençal, *dame* (< DOM(I)NA) 'lady' was not originally in the **aNC** word class, *paysanne* 'peasant (f.)' and *romane* 'Romance, Romanesque (f.)' are derived forms subject to analogical effects—two are definitely valid: *lame* (< LAM(I)NA) 'blade' and *canne* (< CANNA) 'cane'. However, he does not explain the origin of [ɑ] in the words from **aNC** that do show it, such as *flamme*. The certainty of lexical diffusion between [a] and [ɑ] in words without nasal consonants obscures the matter further.

French during this period was a standard language in the making, essentially based on the dialect of Paris but subject to many outside influences. The lower classes of Paris *(le Peuple)* generally led in sound change, as we have seen. The speech of the bourgeoisie *(la Ville)* and the law courts *(le Palais)* represented two prestige norms; a third was that of the royal court *(la Cour)* (Lodge 1993:169-170). These norms did not always coincide; for example, in the 16th century the only the royal court favored *ouïsme*, whereby [o] was raised to [u] in words like *chose* (< CAUSA) 'thing') (Bourciez 1921:§82). To capture such a complex sociolinguistic situation, the charts of Figures 1 and 2 are clearly drastic oversimplifications of reality.

Besides analysis the conflicting and difficult evidence dealt with above, Rochet (also advances clean and elegant-looking structural explanations for most of the changes. (These are brought to the forefront in Ruhlen (1979), the review article that greatly clarifies some parts of Rochet's book.) Adapting the structuralist arguments of Martinet and Haudricourt & Juilland, he claims that the fronting of [u] to [y], which occurred during the Gallo-Romance period, created an imbalance in the nasal vowels of Old French. Leaving aside the nasal diphthongs (that is, looking at the closed syllable word classes **aNC, e/ɛNC, o/ɔNC**, plus **iN** and **uN** where open syllables never diphthongized), there was the following system (Ruhlen 1979:324-34):

ĩ ỹ ←
ẽ õ
ã

The asymmetry was resolved by both lowering and raising, *eliminating the mid vowels* by lowering [e] to [a] (Change 4) and raising [o] to [ũ]). This yielded a symmetrical system by 1300:

ĩ ỹ ũ
ã

However, the system was to be disturbed again by the simplification of diphthongs (Changes 1 and 2): the new [ɛ̃] caused a new asymmetry in the 16th century:

ĩ ỹ ũ
ɛ̃
ã

This time, what happened to resolve the asymmetry was that *all the high vowels lowered,* yielding the system of Modern French:

ɛ̃ œ̃ ɔ̃
ã

We can already predict that the study of the nasal vowels of Wallonia will have some bearing on this account of French. The trigger for this above sequence of changes is the fronting of [u] to [y]. In one of our previous assignments, we examined reflexes of Vulgar Latin [u] and noted that it never fronted in the eastern part of Wallonia. Presumably, then, no structural imbalance in the nasal vowels would have developed there; if **e/ɛNC** and **aNC** merged anyway, this would detract from the above structural account. If the isogloss for Change 4 matched that of [u]>[y], that would strongly support the account. In fact, as we shall see, Change 4 occurred, at best, in one small part of Wallonia, while [u]>[y] happened in most of the territory, so we can only conclude that the fronting of [u] did not necessarily cause the lowering of [e] to [ã].

But, while structural reasoning such as the above can be appealing, we believe that it is inappropriate to argue as Rochet and Ruhlen do, for the following reason.

The nasalized vowels of Old and Middle French were allophones of the oral vowels, until the loss of final nasal consonants caused their phonemicization. Rochet acknowledges this:

> Since *-N* did not disappear until the sixteenth century ... vocalic nasality was not a distinctive feature in the twelfth century. (89n)
>
> [B]y the end of the sixteenth century, with the ef facement of *-N*, the nasalized vowels of O[ld] F[rench] became nasal vowel phonemes, sufficient by themselves to distinguish between words. (94)

Nevertheless, he proceeds to isolate and study what he dubs the '*VN* subsystem' exactly as if it were a phonological entity. He takes the fact that nasal and oral vowels are in complementary distribution—usually an indicator of phonological non-significance—and somehow uses this to argue for their separate treatment:

> [U]ntil the effacement of *-N* in the sixteenth century, *VN* [nasalized vowels] and *VC* [non-nasalized vowels] never occur in the same environment and therefore are never in opposition. Only within the *VN* (or the *VC)* subsystem do vowels stand in opposition to each other; therefore, a study of the structural pressures such as phonological space and equipollence, is only meaningful within one or the other subsystem. (88).

The argument recalls an interior space as drawn by M. C. Escher; its logic is impeccable, but it leads to absurdity. We do not believe that Martinet's theory of phonological space should be construed to allow any contextually defined set of allophones to operate as a system, although we admit that this area of Martinet's thinking is not entirely clear to us:

> By now, it should be a well established fact that one and the same phoneme when appearing in different contexts may be submitted to divergent treatments, and this should need no further emphasizing. In the frame of the present exposition, it is completely immaterial whether a change affects a phoneme in all contexts or only in phonemically well-defined ones, whether what is eventually merged or kept distinct is two phonemes or two combinatory variants of different phonemes. We know that combinatory factors of sound change play a considerable role, but if we want to be able to identify functional and structural factors, we have to concentrate upon them and keep the former out of our field of vision as far as this is practicable. In order to simplify the exposition, it is therefore advisable not to stress at every turn the existence of allophonic deviations, and to establish the following convention: unless otherwise stated, what will be said of phonemes applies equally to those allophones whose phonic evolution happens to be deviating. (Martinet 1952:3)

Martinet seems to acknowledge here that when allophones of phonemes diverge greatly in their participation in a change, this complicates the description of that change in structural terms. Still, he suggests—with some ambiguity—that for discussing mergers it is irrelevant whether one is dealing with phonemes (e.g. *cot/caught* in English, where /ɑ/ and /ɔ/ merge in all instances) or allophones (e.g. *pin/pen,* where *pit/pet* remain distinct).

While we agree that the result may be the same—two word classes combine as one, and cannot cleanly separate thereafter (Garde's Principle)—we do not believe that a merger of allophones can have the same kind of structural cause as a merger of phonemes. The following argument is our attempt to demonstrate this.

Anyone who accepts the theories of Martinet would agree that a vocalic subsystem exists in phonological space, and is subject to structural pressures and changes related to holes in the pattern, margins of security between phonemes, the principle of maximum differentiation, etc. (see Moulton 1962). As an example, take the six-member subsystem of English checked vowels:

ɪ	ʊ
ɛ	ʌ
æ	ɑ

Suppose we take the set of all allophones of these vowels before /b/, and call it VB (following Rochet). By definition, the members of VB stand in opposition only to each other in distinguishing words of the language; only members of VB occur before /b/, and

no other vowel occurs before /b/. Are we therefore justified in assuming that VB forms a phonologically real subsystem? Is there, therefore, a hole in the pattern, because VB consists only of:

ɪ	
ɛ	ʌ
æ	ɑ

There exist words *jib, Jeb, jab, job, rub,* but no word with the sequence /ʊb/ (unless the unstressed initial syllables of *tuberculosis* provide a counterexample). Could we reasonably expect, for example, /ɪb/ to lower and 'merge' with /ɛb/, in order to restore symmetry to this 'system'? Although this is an empirical question, it seems highly unlikely.

To take the argument further, we could specify a more restricted 'subsystem': the short vowels after /dʒ/ and before /b/:

ɪ	
ɛ	
æ	ɑ

Now would we expect fronting of the word *job* to establish symmetry, or backing of *jib* and *Jeb,* whose frontness serves no distinctive function? Again, it is an empirical question, but we do not believe sound change works this way. Of course, if it did, each word would truly have its own history.

The Old and Middle French vowel allophones before nasal consonants might seem a more sensible set than the above, because they shared the phonetic feature of nasality. However, there is only a quantitative difference between the two cases: Modern American English vowels before /b/ would also show some phonetic commonality if analyzed acoustically, although it would be a much smaller effect. Yet if a sound change began to affect the environment before /b/, the effect might some day become more and more pronounced. Thus there needs to be a criterion for when a set of vowels merits being treated as a Martinet-style subsystem; and we believe that phonemicization should be that criterion. So in this study, we will refrain from postulating structural pressures within non-phonemic 'subsystems'.

To return briefly to Rochet and Ruhlen's chronology, it does seem likely that the raising of [o] to [ũ]—if it occurred—had a structural motivation in the fronting of /u/. This is justified because it was the vowel /o/ as a whole, and not just its nasal allophone, raising to /u/, filling the gap. On the other hand, the change of [e] to [a] was not part of any general lowering of the phoneme /e/. Based on the above argument, the isolated lowering of the nasal allophone of /e/ cannot be explained in terms of phonological space.

Moving on from the structural speculations of Rochet and Ruhlen and the theoretical questions they provoke, there exists a third and very different opinion on the evolution of

the nasal vowels of French. As shown in Figure 3, this view radically reconstructs the evolution of most of the word classes. Like Rochet, whose work he empathizes with, Matte rejects the monolithic 'lowering hypothesis' view of the traditional historians, and does so with considerable flair and a complete lack of modesty:

> Il est peu de théories de fondement moins solide, mais qui néanmoins aient persisté plus longtemps que celle des voyelles nasales, telle qu'on la trouve dans la plupart des manuels de phonétique historique. Malgré les données scientifiques avec lesquelles elle est en flagrant désaccord, on continue à la répeter avec obstination ... Si l'on néglige de prendre en considération les données de la recherche instrumentale, de la comparaison des langues modernes et de l'analyse des tendances historiques depuis le gallo-roman jusqu'au français moderne, cette vue de l'histoire des voyelles nasales semble nette et logique, voire satisfaisante. Mais il n'est en rien. Aucune des hypothèses qu'on vient de lire n'est soutenable. Les prémisses de la théorie traditionelle sont fausses et témoignent d'une vue trop étroite des données historiques; de plus, elles passent sous silence tout ce que nous savons du mécanisme de la nasalisation. Le résultat est un cercle vicieux où la fantaisie le dispute à la science et à l'histoire. Bien des philologues et des linguistes ont soupçonné l'erreur, mais personne jusqu'ici n'a su rétablir complètement les fait historiques. C'est ce que nous proposons de faire dans le présent article. [There are few theories with such weak foundations that have survived as long as that of the nasal vowels [of French], such as it is found in most manuals of historical phonetics. Despite the scientific and historical data with which the theory is in flagrant disagreement, it continues to be repeated incessantly ... Unless, of course, one cares to consider the results of instrumental analysis, cross-linguistic comparison, and research into the historical developments from Gallo-Romance through into Modern French, this view of the history of the nasal vowels seems clear and logical, even satisfying. But it is nothing of the sort. None of the hypotheses above can be supported. The premises of the traditional theory are false and bear witness to too narrow a view of the historical data; in addition, they overlook everything we know about the mechanisms of nasalization. The result is a vicious circle where fantasy competes with science and history. Many philologists and linguists have detected the error, but no one until now has been able to fully reconstruct the historical facts. That is what we propose to do in this article.] (Matte 1984:15-16)

Using his theory of 'phonetic modes', Matte attemps to connect the developments of the nasal vowels with the general articulatory tendencies he believes were operating at each period in the history of French. He pushes back the development of allophonic nasalization from the Old French period to the Gallo-Romance period, specifically to the 7th and 8th centuries. This requires a reinterpretation of the textual evidence. Matte believes that what has traditionally been taken as evidence for nasalization—the lack of assonance between vowels before nasals and those before other consonants—does not reflect vocalic nasality at all. This nasality was subphonemic and the poets were blissfully unaware of it. The assonances began to be impeded in the Old French period as the nasalized allophones *raised* to a point where they were noticeably different from the oral allophones of the same vowel. Far from believing the lowering hypothesis, Matte believes that vowels have a universal tendency to raise as they are nasalized. It must be said that this opinion finds some support from current research on American English.

Matte even mentions as a supporting example how the word *manage* can reach [mɛ̃nədž] in 'anglo-americain' (22).

(To continue with the American English analogy, a token of *man* pronounced [mæ̃n] would probably not be judged 'harsh' or 'nasal', even with a fully nasal vowel. As the vowel raises, though, it becomes much more salient. Looking at Matte's proposed evolution of the **aNV** word class, one is reminded of a Southern American *short a* more than anything else; the vowel develops an upglide, not an inglide.)

In Matte's view, almost every effect derives from one and the same cause: the reigning articulatory mode. Unfortunately, we were quite unfamiliar with this theory of sound change, and were unable to consult Matte's book on the subject, which makes it difficult to argue with the details of his claims. Clearly, though, if one denies the reality of articulatory modes, the whole thing falls apart.

Matte argues that different changes naturally occur under the sway of different modes; while raising of vowels as they nasalize is normal under one mode, the lowering and denasalization that occurred later are natural consequences of the new mode which had taken over by that time. Some of the characteristics of the two modes are the following:

mode décroissante (falling mode)	*mode croissant* (rising mode)
relaxed articulation	tense articulation
peaked in 7th century	took over in 13th century
gave way in 13th century	peaked in 17th century
falling diphthongs [VV] form	rising diphthongs [VV] form
closed syllables favored	open syllables favored
nasalization	denasalization
nasal vowels raise	nasal vowels lower

Matte's theory also attempts to address why French developed nasal vowels at all. Previous theories had suggested Celtic substrate influence, or alternatively 'man's physiological weakness, explainable in [George Straka's] opinion by the terrible conditions of existence created by the Crusades (Rochet 1976:20). Matte says it happened because the relaxed, falling mode was stronger in northern Gaul than in any other part of Romania; the many phonological reductions of the Latin word as it developed into French, as compared with Spanish or Italian, are thus a consequence of the same relaxed articulation as nasalization is. However, Matte argues that the stronger mode itself could have been due, at least in part, to Celtic influence, as the Latin sounds were 'modelés et mâchés par les bouches gauloises' [imitated and masticated by Gaulish mouths] (Matte 1984:18n).

Regarding the vagaries and eventual coalescence of **aNC** and **e/ɛNC** (Change 4), Matte's theory offers an explanation that has nothing to do with social class differences or two norms of poetic rigor. Rather than thinking of **e/ɛNC** lowering, as everyone else

had assumed, he believes that **aNC** raised in the Old French period, came quite close to **e/ɛNC**, close enough to form assonances in the *chansons de geste*. Then the vowel of **e/ɛNC** began to fall away once the articulatory mode began to shift. A strange detail of Matte's chart is that the final result is pushed very far forward, as **aNC** stays a step ahead of **e/ɛNC** before eventually they eventually merge as [ɑ̃] in the 18th or even 19th century. We did not find any evidence in Matte's article or elsewhere that these word classes were kept distinct for quite so long.

Regarding the high vowels, the traditional view was that they nasalized quite a bit later than the rest (and that these unnatural species lowered as they became nasal, or just afterward). Textual evidence seemed to bolster this view, because the high vowels before nasals do not show any evidence of different pronunciation in Old French.

Rochet demonstrates, along with Ruhlen, that high nasal vowels are actually not universally disfavored, but in fact quite common cross-linguistically. Rochet concludes that high nasal vowels developed at the same time as all the others, as a single synchronic rule. He must therefore reinterpret the textual evidence, but his attempts to do so doe not present a coherent picture. Every vowel seems to require a different account:

> The separation [lack of assonance] of *aC* and *aN* probably reflects the presence of nasality in the latter and its absence in the former. (71)
>
> It is reasonable to assume that ... if *eN* did not assonance with *eC*, it is because the timbre [i.e. height] of the nasalized vowel *e* was beginning to diverge [i.e. lower] from that of the vowel *e* followed by a non-nasal consonant. (55)
>
> The occurrence of *iN* and *uN* in laisses [strophes] in *iC* and *uC*, and particularly the cases of free mixing, seem to indicate that the basic timbre of the vowel was not altered by the added nasality. (77)

Looked at from Matte's point of view, the situation is more comprehensible. He agrees that all vowels nasalized at the same time, but claims that in no case did this allophonic nasality itself affect any Old French vowel enough for anyone to notice. Only by promoting raising (not lowering) did nasality cause a noticeable change. This might seem like hair-splitting, a distinction without a difference: if nasalization always causes raising, how can we hope to discern the respective effects of the two on perception? The answer is found in the case of the high vowels. They nasalized like all the others, but they clearly could not raise because they were already maximally high vowels. So they remained different in nasality and only in nasality, which was below the level of consciousness, and so they still formed assonances freely.

As is clear from the above discussion, Matte's theory of the evolution of French nasal vowels, while revolutionary, is also very appealing. A key question is whether his supposedly universal articulatory modes are compatible with what we know about the evolution of many different languages. Another area of concern regards Change 1, where **eNV** and **aNV** fell together. Matte dates this to roughly the 9th century, but if the distinction was really lost so early, around the time of the very first surviving texts in the

vernacular, how did the spelling system manage to consistently preserve the difference as *ein* vs. *ain*? Indeed, Martinet (1965:118) makes the same point regarding two other scholars' dating of Change 4 as early as the 11th century.

In this study, we will examine the nasal vowels of Wallonia from a phonological point of view, looking at the different subsystems—for the modern period, this term is perhaps justified—that are found there. In addition, we will compare the incidence of phonemes among the dialects and between them and French. This will correspond to the historical-phonetic approach, reconstructing the evolution of the ten word classes over time.

We take the four principal changes identified above, and ask whether they are sufficient to account for the diversity we find. For these 'French' changes and any new ones we identify, we will describe in what part of our territory they occurred, and if possible in what order. This examination will cast light on the above accounts of French, perhaps enabling us to better judge between the views of Figures 1-3. However, the principal objective is to describe, and where possible, explain, the developments in Wallonia.

In general, the relationship of French to the dialects of Wallonia is a matter of some complexity. Today, they are considered—and function as—separate languages; for example, a dialect speaker who also speaks French (as virtually all do) is 'bilingual', and in discussing certain words, the *ALW* will describe a particular form as 'emprunté au français' [borrowed from French]. A distinction is drawn between such borrowings and the 'autochthonous' developments of the dialects. At an earlier time, however, the dialect of Paris and those of Belgium were much more similar—indeed, at a sufficiently remote point they were perhaps identical—and linguistic changes presumably could have diffused from one area to the other without deserving the implications of the term 'borrowing'. To the extent that this occurred, even the 'autochthonous' developments of the dialects of Wallonia are related to those of French. And if Matte's view of linguistic evolution is correct, then a shared articulatory mode could cause the same change to occur in both areas without it being either borrowing or diffusion.

THE WORDS (Figure 4)

Though it is perhaps impossible to draw a clear line between 'autochthonous' and 'borrowed' forms, we still considered this factor in choosing which words to examine from the *ALW*. With one exception, we rejected words where the editors noted extensive borrowing from French. We selected 27 words, which are listed in Figure 4. Each *ALW* item is listed along with its etymology, its French form, and, where it was known, the sentence from the atlas questionnaire used to elicit the word. The etymologies are intentionally anachronistic, in that the stressed vowels (those before the nasal consonant) are given in their Classical Latin form, so as to be more familiar, while the endings of the words show the loss of final consonants characteristic of Vulgar Latin. As shown at the

top of Figures 1-3, between the time of Classical and Vulgar Latin, distinctive vowel length was lost, and there was a merger of the pairs [ĭ]/[ē] and [ŭ]/[ō].

Among the 27 words chosen are examples intended to represent all ten major word classes. However, some of the words are more idiosyncratic and require discussion.

1) The word class **ɔNV** is unusual in that its phonetically regular reflex did not survive in French. Front and back vowels of the same aperture usually evolved symmetrically, and so we would have expected to see **ɔNV** evolve into [wɔ̃] or [wɛ̃], just as **ɛNV** became [jɛ̃]. But corresponding to *bien* (< BENE) 'well', Modern French has *bon* (< BONU) 'good', not **buon* or **buen*. Rochet explains what occurred:

> V[ulgar] L[atin] [ɔ] in free stressed position diphthongized to *uo, ue* ... The non-diphthongized and the diphthongal forms co-existed for a long time ... Whereas the front diphthong *ie* became generalized ... in the back, the non-diphthongized form was already more frequent in the 12th century, and finally *ueN* disappeared completely. (Rochet 1976:62)

This means that in French the word class **ɔNV** fell in with **o/ɔNC**. Unless this occurred everywhere in Wallonia as well, we would expect **ɔNV** to show a different reflex than **o/ɔNC** in some dialects. Unfortunately, the reflex of BONU was not collected everywhere. (Since only 8 of 20 projected volumes of the *ALW* have been published, maps for some very common words have not yet appeared. In this case, the questionnaire was asking for the dialect term for *souverain* 'sovereign' in describing a remedy. Many people who did not have a specialized term for this simply gave 'good' as their response.) The other **ɔNV** word we chose, HOMO 'one (generic pronoun)', is proclitic and its lack of stress could have impeded diphthongization anyway.

2) The word CANE 'dog' developed like only a handful of other words. Though it began in the **aNV** word class, the palatalization of the preceding consonant caused a change in the vowel, and in French it joined the **ɛNV** word class (*chien*). Again, it is possible that the dialects of Wallonia would show a different development, especially since the palatalization of velars did not occur in some parts of Wallonia, or only occurred much later, after vowels became nasalized.

3) In most of Wallonia, the dialect equivalent of French *ne ... pas* 'not' in negative statements derives from a two-word Latin phrase. While some have challenged the etymology NE GENTE 'no people', proposing instead a derivation from NEC ENTE 'no being', in either case the negative phrase evolved as one phonological word, causing the intervocalic velar consonant to weaken and become yod [j], creating a diphthong. When written, it is generally spelled *nient*, suggesting that, like CANE, it fell in with **ɛNV**.

4) The word RENE was the only example we could find of **eNV** (excluding words where the nasal consonant was followed by A). It was not collected at every point, because the questionnaire was asking for 'lumbago' (lower back pain)—known in French as *tour de reins*—and some people responded with a term that did not include the word for 'kidneys'. This means that one of the major word classes was missing from some points.

In French, **eNV** fell in with **aNV** (Change 1), and we would want to know whether (and where) the same occured in Wallonia.

THE POINTS (Figure 5)

For each word, we noted the vowel quality at every point where it was recorded. This task was made immeasurably easier by the *ALW*'s method of presenting its data, in full, in tables, as well as interpreting and displaying it in maps. While the *ALW* base map contains 305 points, complete interviews were also obtained at 37 other points, and partial interviews at several hundred more (*ALW* I:15).

Once we had entered all the data, we eliminated any point where there clearly was insufficient data to evaluate the nasal vowel subsystem; that is, where several of the major word classes were missing. We were left with the 359 points shown on Figure 5 (most of which, of course, are the *ALW* base points; in retrospect, it would have been easier, and not much less revealing, had we coded only those points).

We obtained the latitude and longitude of each point from the website of the Astronomical Society of Liège (http://www.astro.ulg.ac.be/~sal/coord.htm), and entered this data into MapInfo VERSION NUMBER, a GIS (Geographic Information Systems) software package. All the maps in this study were created using MapInfo.

Outside of Wallonia, the cities of Aachen (Germany), Brussels (the capital of Belgium), Charleville-Mézières (France), Compiègnes (France), Lille (France), Luxembourg, and Maastricht (Netherlands) were added for the purpose of orientation. From Compiègnes, in the southwest corner of our map, it is sixty miles (~100 km) to Paris.

Within Wallonia, Mons is the capital of the province of Hainaut; Namur is the capital of a province of the same name, as is Liège. The southeasternmost province of Wallonia, called Luxembourg (not to be confused with the country of the same name), has Arlon as its capital. In Arlon, as in Brussels, French is spoken, but not Romance dialect.

The other labeled points are the *chefs-lieux* (capitals) of the administrative districts, or *arrondissements* (although technically there is no *arrondissement* of Malmédy; but rather a canton). Most of these *chefs-lieux* are also data points; however, Charleroi, Thuin, Philippeville, Dinant, Bastogne, Neufchateau, and Virton are not. The communes (towns and villages) of Wallonia are identified by two letters standing for the *arrondissement*, followed by a number: the *chef-lieu* is always assigned the number 1, and the other points are labeled going east-to-west, then north-to-south within the *arrondissement*. Namur is thus Na 1, Liège is L 1, and so forth. The *arrondissements* are always listed in the following order: To(urnai), A(th), Mo(ns), S(oignies), Ch(arleroi), Th(uin), Ni(velles), Na(mur), Ph(ilippeville), D(inant), W(aremme), H(uy), L(iège), Ve(rviers), M(almé)dy, Ma(rche), B(astogne), Ne(ufchâteau), Vi(rton).

Since the time the *ALW* was first published, Belgian federalism has expanded considerably, and there have been changes to the administrative organization of the country. For example, Wallonia now exists as a legal entity *(la Région wallonne)*, with Namur as its political capital, while Nivelles is the capital of a new province of 'Walloon Brabant', created by dividing the old province of Brabant along the language frontier (our base map does not reflect this 1995 change).

Our territory is the northeasternmost area of Gallo-Romance dialect speech, of the *langue d'oïl*. To the north, in the part of Belgium called Flanders, Dutch dialects are spoken. To the east, in Luxembourg and Germany—as well as in two adjacent areas of Wallonia—German dialects are spoken.

In Wallonia itself, the use of the Romance dialects studied here decreased significantly during the twentieth century. 'Today, although there are no large-scale sociolinguistic surveys ... the number of regular active speakers can be estimated at 35-45% of a total population of 3,200,000' (Li Ranteule). Older people are more likely than younger people to be active speakers, and there are more active speakers in the rural southern parts of Wallonia than in the northern industrial belt.

THE SYMBOLS (Figure 6)

Figure 6 shows the correspondences between a) the phonetic alphabet used in the *ALW* (and by most Walloon dialectologists), b) a modified version of the International Phonetic Alphabet (IPA), and c) the working code we used for storing the data in the MapInfo database. All three alphabets are shown arranged around a diagram in the shape of a nine-pointed star, designed to indicate the approximate position of vowels in phonological space. This type of diagram derives from the work of Moulton (1960, 1962), although we have aimed for a more direct iconic relationship between position on the diagram and position in phonological space.

Imagining the vowels laid out around the circumference of a single circle requires that we ignore front rounded vowels (as well as central vowels, and back unrounded vowels too, were there any). In general, there is a robust series of front rounded vowels in the phonological systems of these dialects, and to omit them from our iconic symbols would not be justified for oral vowels. But for a combination of reasons, front rounded nasal vowels are of very low incidence, if not completely absent. They will therefore be set apart and treated separately in this study. If we speak, later, of two-, three-, and four-nasal-vowel subsystems, it must be understood that these numbers do not include the potential existence of a front rounded nasal phoneme.

The phonetic alphabet of the *ALW* was translated into our code as follows:

a) The nucleus of the stressed vowel was assigned a number (from **0** to **9**) corresponding to its position on the nine-pointed diagram; front rounded vowels were given a letter (**A** through **D**).

b) The nasality of the vowel, if any, was indicated by ~ for fully nasal and ^ for half-nasal (the shape of ^ was intended to suggest half of ~).

c) Any nasal consonant or glide following the vowel was indicated: **m** for a labial [m], **n** for an alveolar [n], **y** for a palatal segment [j] or [ɲ], **g** for a velar [ŋ]. All other consonants, because they seemed less related to nasality, were ignored.

d) Following glides toward the back were noted by **o**, those toward the front by **e**.

e) Glides preceding the vowel were recorded: **>** for a front onglide [j], **<** for a back [w].

f) Vowel length was indicated following the procedure of the *ALW*. In that framework, mid-close vowels are considered naturally long, as are nasal vowels. Only these two categories, therefore, can potentially bear *, the diacritic of shortness. All other vowels are considered naturally short, and thus can potentially bear the diacritics of length, ' (in *ALW*, a hacek) for medium length and " (in *ALW*, a macron) for full length.

As star diagrams with more than nine points are difficult to read, the positions for pure mid vowels (**3**,**9**) and mid-open vowels (**4**,**8**) were conflated; these vowel apertures were usually not distinguished in the source data anyway, nor are they in the IPA. The highest vowel types (**1** [i], **!** [ɪ]; **u** [u], **U** [ʊ]) were also combined. The complete set of data, as originally coded, can be consulted in the Appendix.

PREVIOUS STUDIES (Figures 7 & 8)

As mentioned above, the nasal vowels of several points in Wallonia have been described by previous researchers, as part of their comprehensive accounts of the speech of particular locales. Since most of these were purely synchronic studies, their authors did not always directly consider phonemic incidence. But because they all give examples to illustrate each phoneme—words whose etymologies are known—we can observe the reflexes of some of our major word classes. Figure 7 is a synopsis of the previous studies from this historical-phonetic point of view. Figure 8, on the other hand, is a map displaying the pattern of nasal vowels found, ignoring their incidence and history. Wherever the underlying study was phonologically rigorous, the symbol can be trusted as giving the phonological subsystem of nasal vowels at that point.

The first point we shall consider (following, as always, the west-to-east-to-south order of *arrondissements*) is the city of **Charleroi**, which lies on the Sambre River in eastern Hainaut (Bal 1966). Although we lack data on several word classes, most importantly **aNV**, we can see that **eNV** and **e/ɛNC** both emerge as /ɛ̃/. That is to say, Change 4, the lowering of **e/ɛNC**, did not occur. The word class **uN** shows variability: while *brun*

'brown' has /œ̃/ only, the words *chacun* 'each person', *un* 'one (numeral)', and *lundi* 'Monday' are more frequently heard with /ɛ̃/, though /œ̃/ also occurs.

The development of **aNC** and **o/ɔNC** reveals socially correlated variation: one section of the city, the Ville-Haute, has a contrast between /ɑ̃/, from **aNC**, and /ɔ̃/, from **o/ɔNC** (and probably other word classes), while another neighborhood, the Faubourg, tends to have /ɔ̃/ for both. Bal elaborates: 'la distinction ... se faisant à l'exemple du français est considérée comme d'un niveau plus élevé, le syncrétisme ... comme grossier' [the distinction, being made after the example of French, is considered as of a higher level, the merger as vulgar] (224).

Bal considers this variation—as well as other features, unrelated to nasal vowels—to reflect what he calls the 'internal duality' of the dialect. Although it later became a major industrial city, Charleroi's 17th century origin makes it very young in relation to most of the other urban centers of Wallonia. Bal considers it transitional, and 'certainly not a linguistic center' (226). This echoes the succinct statement of Grignard (1908:386): 'C'est un carrefour et non un centre. [It is a crossroads, not a center.]'

At least as striking as these variable mergers is the treatment of **iN** and **ɛNV**, where Changes 2 and 3 apparently did not occur exactly as they did in French. These two word classes both yield /e/, a nasal vowel phoneme higher than and clearly distinct from /ɛ̃/, as quite a few minimal pairs demonstrate (e.g. [vẽ] < VINU vs. [vɛ̃] < VENTU). There are only a few minimal pairs for the oppostion /e/~/eː/, however, and Bal notes, 'Quand il ne remplit aucune fonction distinctive, le phonème [/e/] peut se réaliser en des variantes incomplètement nasalisées, ce qui n'est jamais le cas de [/ɛ̃/]' [When it [its nasality?] fills no distinctive function, the phoneme /e/ can have incompletely nasalized variants, which is never the case for /ɛ̃/] (225). This is an interesting functional statement which we will return to later; Bal suggests that /e/ and /eː/ are distinct phonemes, distinguished only by nasality, yet specifically when there is no ambiguity, the /e/ can be realized with less than full nasality, perhaps even as [eː].

To summarize Bal's findings for Charleroi, the Ville-Haute has ɑ̃ ≠ ɛ̃, while the Faubourg has ɑ̃ = ɛ̃.

In Grignard's work on what he named the 'West Walloon' dialect area, there is both confirmation of the above phenomena and some description of their geographical extent. Grignard finds **aNC** > [ɔ̃] in the part of Hainaut directly north of Charleroi, but actually not in the city itself (Map I and p. 401); perhaps his informant was from the Ville-Haute. Grignard finds a nasal vowel higher than [ɛ̃] in a large area—including Charleroi—as the reflex of **ɛNV** (Map IV and p. 405-6); as the reflex of **iN**, he finds such a vowel in a smaller area, for which no map is given (419).

The next point, **Spontin**, a village in the Bocq valley to the northeast of Dinant, was examined in an unpublished dissertation, but the phonological system is summarized in

an article on morphology by the same author (Van Kerchove 1975). It includes the three nasal vowel phonemes /ɛ̃/, /a/, /ɔ̃/, plus the front rounded /œ̃/. We symbolize this system—the same as that of French in inventory if not in incidence—as ⊤.

Northeast of Waremme, in the fertile low plateau known as *Hesbaye liégeoise*, we come to the town of **Oreye**, the subject of a detailed investigation (Warnant 1956). The primary thrust of Warnant's work could be called quantitative phonotactics; he aims to describe what he calls the 'phonic constitution of the word' (35). Fortunately, reasonably complete phonetic and phonological descriptions are also given. From them, we can see that Change 3 occurred, but Change 4 did not: **iN, aNV** and **e/ɛNC** all become /ɛ̃/.

Like the Faubourg of Charleroi, Oreye has experienced a merger in the low-back region. However, here it is /ɑ̃/ which has prevailed, and /ɔ̃/ which has been lost. Although Warnant sees 'slight differences' in the radiograms of the words *lampe* (< LAMPA) 'lamp' and *pompe* (< Dutch POMPE) 'pump', and entertains the notion that these articulatory differences represent 'a trace of an earlier state where the nasals of *a* and *ò* were distinct' (107), it seems more likely that they actually represent the effect of the preceding consonant. Warnant also explicitly states that the sounds are now the same, both in Oreye and in surrounding villages. In an earlier, encylopedic work on agriculture in *Hesbaye liégeoise*, Warnant constructs an isogloss for this feature, on a map which will be discussed further below. Information from historical documents, presumably confusion in spellings, indicates that the merger must date to the end of the 17th century, or earlier (107). The system of Oreye is now ⌒.

According to Warnant, the front rounded nasal vowel /œ̃/ 'only exists in two words borrowed from French' (125); these are [dʒœ̃:] (< *juin* < IUNIU) 'June' (122) and [kɔmœ̃:] (< *communs* < COMMUNI) 'outhouse, WC' (145). As *juin* is pronounced [ʒɥɛ̃] in standard French, the claim might seem debatable for the first of these words, but in fact a variant [ʒœ̃] was apparently once viable in the standard (Bourciez 1921:109); this will be discussed below. From other examples, such as [ɑ̃:k] (< UNU) 'one (numeral)', we can see that the 'autochthonous' development of the word class is **uN** > /ɑ̃/.

Between Liège and Verviers, in the pastureland of the *Pays de Herve*, the point **Labouxhe** (Lechanteur 1973) presents a strikingly different picture from the others surveyed so far. Labouxhe is a hamlet in the commune of Mélen, but we will use the more specific placename for two reasons. First, Lechanteur notes that the speech of his informant—his mother, incidentally—'differs ... from that of the center of Mélen,' having more in common with the area around Verviers (164). Second, this impression is confirmed by the *ALW* interview obtained at Mélen [L 71], which is indeed quite different from what Lechanteur describes, while the interview conducted at Charneux [Ve 6], just to the northeast, is practically identical to his description.

Phonologically speaking, Labouxhe has no nasal vowels at all. Phonetically, the high and mid vowels are always completely oral, while the low vowels /a:/ and /æ:/ are pronounced with a variable degree of nasality (and when nasal, /æ:/ is closer to [ɛ̃]). As this variation is not limited to the nasal word classes, but also affects words with no etymological nasal consonant, Lechanteur sensibly concludes that the feature of nasality fulfills no distinctive function and is hence phonologically irrelevant.

Lechanteur often describes features of the dialect of Labouxhe with reference to that of **Liège**, the largest city in our territory, situated on the Meuse River. The dialect of Liège is by far the best-known in all of Wallonia, and its strongly nasalized vowels form the pattern ⊤. Lechanteur notes something of great relevance to our study when he claims that because of their orientation towards Liège, *ALW* investigators in the *Pays de Herve* were reluctant to record fully oral vowels in the nasal word classes:

> Le phoneme */a:/* se réalise selon les témoins ou selon les moments sous diverses formes: *ã*, *a*^{n} ou bien *ã* ... L'enquêteur est souvent tenté, faute d'un critère stable, de noter *a*^{n}—c'est souvent le cas dans l'A.LW.—ce son flottant qu'il sait correspondre à un *ã* liégois, mais qui lui paraît imparfait. [The phoneme /a:/ is realized, according to the informant or according to the moment, by diverse forms: [a], [a^{n}] or just [a:]. The investigator is often tempted, for lack of a stable criterion, to note as a^{n} [that is, a half-nasal vowel]—and this is often the case in the *ALW*—this wavering sound that he knows to correspond to [a] in Liège, but which seems imperfect to him.] (189)

But this procedure of 'splitting the difference' would only be legitimate as long as it were applied equally to those instances of /a:/—also wavering in nasality—that have no etymological nasal consonant and thus do not correspond to a nasal vowel in Liège. Otherwise, their phonemic equivalence would be obscured. We will discuss this issue further below, but it is worth mentioning that it is not only the fieldworker who may be misled by more-or-less conscious comparisons to the better-known dialect of Liège. As analysts, we must be sure not to treat the dialect of Labouxhe as a denasalized version of that of Liège, because there is no reason to believe that the one derives from the other in any meaningful sense. At times, Lechanteur seems to do this, as he advances functional explanations such as the following:

> Pour le *ã* lg., la nasalité et la durée sont redondantes; notre patois peut donc éliminer une de ces deux marques sans qu'il en resulte la moindre confusion. [For the /a/ of Liège, nasality and length are redundant; our patois can therefore eliminate one of these two features without any resulting confusion.] (190)

Lechanteur may only be making a synchronic comparison between the two dialects here, rather than any historical speculation. But a complete understanding of the differences in nasality must include an account of its origin.

If the dialect of Labouxhe is the product of denasalization, if it once had nasal vowels only to lose them later, its pattern at the time of denasalization could not have been that of present-day Liège. If it had, the other nasal vowels would have denasalized as follows:

[ɛ̃] to [ɛ:], [ɔ̃] to [ɔ:], and [œ̃] to [œ:]. And while all three of these long oral vowels exist in the dialect of Labouxhe, they are not the usual reflexes of the nasal word classes.

Indeed, Lechanteur notes that the Liège phoneme /ɛ̃/ has no single correspondent in Labouxhe, but rather corresponds to both /e:/ and /æ:/ (189). Using our word class categories, we see that in Liège **iN**, **eNV**, **ɛNV**, **aNV** and **e/ɛNC** all yield /ɛ̃/, while in Labouxhe **iN** and **ɛNV** yield /e:/ while **eNV**, **aNV**, and **e/ɛNC** yield /æ:/.

Both dialects underwent Change 1 (the falling together of **aNV** and **eNV**); neither dialect underwent Change 4 (the lowering of **e/ɛNC**). They differ with respect to Change 2 (the treatment of **ɛNV**) and Change 3 (the treatment of **iN**): Liège, like French, lowered both these word classes as far as /ɛ̃/; in Labouxhe, like in Charleroi, they remain distinctly higher. In Charleroi, they form their own high nasal phoneme /ẽ/, while in Labouxhe they combine with the long oral vowel /e:/, which also has other sources.

In Labouxhe, it is the other three word classes that form their own new phoneme, /æ:/, joined by a few non-nasal words or word classes (e.g. [tæ:r] < TERRA 'earth', [fæ:j] < FILIA 'girl'). Again, Lechanteur describes this development in functional terms; again, it is unclear how (or if) these remarks can be interpreted historically:

> Pour une partie des mots que le [liégeois] distingue par une opposition orale/nasale (*è:/ẽ*), notre parler a substitué, par la création d'un degré supplémentaire d'aperture dans les antérieures non-arrondies (ɛ), une autre opposition, entre orales, très efficace. [For some of the words that in Liège are distinguished by an oral/nasal opposition [ɛ:]/[ɛ̃], our dialect has substituted, by the creation of a supplementary degree of aperture in the front unrounded [series] [æ:], another opposition, among oral vowels, [that is] very effective.] (190).

Although the evidence is less clear, there may be another, somewhat parallel development in the back vowels. While **ɔNV** and **o/ɔNC** (and usually **uN**) yield /o:/, **oNV** seems to give /ɔ/, admittedly based on the single example [nɔ] < NOME 'name'. If corroborated, this would be another difference of incidence in the non-nasal vowels of Labouxhe, where Liège has the same nasal vowel /ɔ̃/ for all these classes.

Lechanteur indicates that /œ̃/ in Liège corresponds to /ø:/ in Labouxhe, but gives no examples of this. He does state that in both dialects, the vowel is very rare (190).

Because of the above differences, we can conclude that before denasalization, the dialect of Labouxhe must have had a different pattern of nasal vowels than Liège does today, including one or two more distinctions between word classes. As an alternative, one might reasonably ask whether we are looking at the product of denasalization at all. Rather than postulate a complex nasal system at an earlier date, we might wonder if nasal vowels ever developed in Labouxhe at all. Again, we will return to this issue below.

To reach our next previously studied point, we move south to the high forested plateau of *Ardenne*, where the town of **Tenneville** lies on the main road between Marche and Bastogne. The speech of Tenneville was the subject of a book-length investigation that combined the historical-phonetic and phonological approaches, not only tracing the

evolution of word classes but also establishing the phonemic oppositions in the present-day dialect (Francard 1980).

Francard describes a system of nasal vowels very similar to what we saw above for Liège. The word classes **iN**, **eNV**, **ɛNV**, **aNV**, and **e/ɛNC** all yield the phoneme /ɛ̃/. That is to say, Changes 1, 2, 3 have occurred, while Change 4 has not. The phoneme /ɔ̃/ is found as the reflex of **ɔNV**, **oNV**, and **o/ɔNC**, and also as the usual reflex of **uN**. Again, the phoneme /œ̃/ 'only appears rarely ... and almost exclusively in borrowed words' (287). Francard is somewhat ambiguous about the phonetics of the low nasal vowel that is the reflex of **aNC**. It is described as 'vélaire [back]' at one point (286), but in a chart of the nasal vowels it appears in the middle (288). It is also described as similar in position to the phoneme /a:/, which is placed in the front unrounded series although it 'tends to approach the back vowels' phonetically (285). Probably it is a low central vowel, for which there is no IPA symbol; we will use /a/. The overall system of Tenneville is thus symbolized ⊤.

Further to the south in the *Ardenne,* just outside Neufchâteau, lies the town of **Longlier**. A phonological investigation conducted there (Pierret 1984) revealed the existence of both long and short nasal vowels. In the previous studies, all the nasal vowels were described as long, and so their length was not deemed significant (Bal 1966:223). In Longlier, however, Pierret finds such pairs as [ʒã*] 'people' vs. [ʒã] 'we have', [ba*] 'ban, banns' vs. [ba] 'bank [variant]'. However, none of these pairs is perfectly minimal, as the longer vowel often spans a morpheme boundary (as in [ʒã]) or may be the product of a synchronic deletion (as in [ba] < [bak]).

For this reason, perhaps, Pierret is equivocal as to whether or not these short nasal vowels are distinct phonemes. In one place he writes, 'The phoneme /a/ is realized either as a long or a short vowel' (181), implying that the distinction is not phonemic. However, a* is listed separately in the table of vowels (182), and Pierret suggests that the distinction is indeed significant when he writes,

> On ne paraît pas avoir décrit, dans d'autres régions de Wallonie, des parlers utilisant l'opposition de durée pour les nasales. [It does not seem that anyone has described, in other regions of Wallonia, dialects that use the opposition of length for nasal vowels.]

Pierret goes on to explain that the short nasal vowels are undergoing change. Only the oldest speakers in Longlier still use [ɛ̃*], while some speakers have lost [a*] as well. Even without this complication, we can see from Figure 7 that [a*] does not appear consistently, from the historical-phonetic point of view. To represent the maximal system found in the community, we use the symbol ⊤ for the long vowels and ┐ for the short vowels, although it should be noted that [a*] is further back than [a], phonetically. Pierret also reports that more robust systems of short nasal vowels can be found nearby. Neuvillers, less than ten miles (16 km) to the northwest, allegedly has three short nasal and three long nasal vowels (⊤ for both subsystems).

We know of two phonological studies that we were unable to consult: the work of Degraef on the speech of Naast (near Soignies), and that of Widar on the speech of Wanne (in *Ardenne liégeoise* southwest of Malmédy). These are cited by Francard (1980:249); there may also be more recent studies that have not come to our attention (other than Pierret 1984).

There are also a number of earlier, historical-phonetic studies of certain dialects of Wallonia that predate the phonological approach employed in the above works. As Moulton reminds us, careful historical-phonetic studies 'should be welcomed with gratitude and humility' (1965:579) because they can be 'recast' in phonological terms.

One such piece of work (Niederländer 1900) describes the dialect of the city of **Namur**, located at the confluence of the Sambre and Meuse Rivers, between Charleroi and Liège (but closer to Charleroi). The nasal vowel reflexes as given in this study correspond to a system ⊤ that is practically identical to the one found in Liège (and in Spontin and Tenneville). But Niederländer finds a more Charleroi-like system 'a few kilometers' to the north, around Vedrin and **Gembloux**, where a high nasal vowel [i] occurs in the word classes **iN** (25) and **ɛNV** (16); we represent such a system by ⊹. Based on his analysis of early texts, Niederländer concludes that this high front nasal vowel was once present in Namur itself, citing documents from the 13th century; while this comes as little surprise for **iN** (which must have originally had [i]), the examples for **ɛNV** are significant (16). However, we should bear in mind that at that date, the nasal vowels, no matter their number, would have still been allophonic variants rather than distinct phonemes.

Another historical-phonetic study, of particularly impressive depth, treats the dialect of **Gueuzaine-Weismes**, in the canton of Malmédy (Marichal 1911). This area was part of the German Empire until the Treaty of Versailles, which helps to explain how Marichal, a native speaker of the dialect, came to describe it in the traditional style of a German dialect monograph. Marichal's study notes 'einen ausgesprochenes Unterschied [a pronounced distinction]' between /e/ and /ɛ̃/ (11); we believe that his native-speaker credentials make it rather safe to interpret this as a phonemic distinction. The higher vowel, /e/, is the reflex of **iN** and **ɛNV**, just as in Charleroi. It is also the reflex of 'Palatal+*a*+*n*', the small class that includes CANE.

In Gueuzaine-Weismes, the word class **aNC** yields /ɔ̃/, while the back-vowel word classes all yield /o/. Unlike Oreye and the Faubourg of Charleroi, no low-back merger occurs here. One could imagine a recent chain shift having occurred, starting from a system with /a/ and /ɔ̃/ respectively, or else that /o/ never lowered from that height, which could have been the cause—or the effect—of the backing of /a/ to /ɔ̃/. In any case, the following symmetrical system was eventually established: ⋋.

In general, Marichal's work is encouraging with respect to the methodology employed in this study. Most of the words we chose are included in his own lists of examples for

the various word classes. Another useful aspect of Marichal's study is that he gives intermediate stages of some of the developments, in addition to the starting points, in Latin, and ending points, in the contemporary dialect.

iN > [i] > [e]	(35)	**ɛNV** > [ien] > [in] > [i] > [e]	(24)
aNV > [ain] > [ɛ̃]	(31)		
ɔNV > [ʊ́ɔn] > [ʊ́ɛn] > [un] > [u] > [o]	(38)		
aNC > [a] > [ɔ̃]	(15)		

Marichal compares his dialect to that of a nearby town, in this case **Malmédy**, less than five miles (8 km) to the west. From the comparison, we learn that Malmédy's nasal vowel subsystem lacks the two salient features of Gueuzaine-Weismes: it has only one front nasal vowel, and the low nasal vowel is not backed. As described by Marichal, Malmédy's pattern of incidence is the same as that of Liège (like Namur, Spontin, and Tenneville). One difference is that in both Malmédy and Gueuzaine-Weismes, a 'guttural occlusion' or 'echo'—clearly [ŋ]—can occur in pre-pausal and pre-vocalic position (11).

A very early historical-phonetic study (Marchot 1892) shows **Saint-Hubert**, in central Luxembourg, also to have the same basic pattern as Liège. At the edge of Walloon Brabant, near the linguistic frontier, the dialect of **Neerheylissem** (de Ruiyg 1949) seems to have a similar pattern, with the exception of the word class **aNC**, which varies, as in Charleroi, between [ɑ̃] and [ɔ̃]. Here the variation appears to be lexical rather than social.

Looking at Figure 8, the overall picture of nasal vowel patterns revealed by previous studies, we observe several things. Except for Charleroi, the western province of Hainaut is uncharted territory. The pattern ⊤ seems well-represented in the heart of Wallonia, including the cities of Namur and Liège. Other points have two distinct front nasal vowels, and the existence of this distinction in widely separated places (Charleroi and Gueuzaine-Weismes) is suggestive; one might wonder whether the intervening territory once had it as well. In the northwest of the province of Liège there is a point (Oreye) with only two phonemic nasal vowels, presumably following a merger, and in the northeast of the province there is a point (Labouxhe) with variable nasality, but without phonemic nasal vowels. In the south of the province of Luxembourg, we even see a point (Longlier) with significant (perhaps even phonemic) length distinctions among the nasal vowels.

Looking back at Figure 7, we can observe the following with respect to the evolution of word classes. Where we have data for **eNV**, it seems always to have fallen together with **aNV** (Change 1). The word class **ɛNV** has raised, but it does not seem to have given a diphthongal reflex anywhere (Change 2). The word class **iN** (along with **ɛNV**) lowers in most places to fall together with **aNV/eNV**, but at some points it (again, along with the raised **ɛNV**) remains distinct (Change 3). The word class **e/ɛNC** never seems to lower so as to fall together with **aNC** (Change 4). And the development of **uN** shows several possibilities, of which the front rounded nasal is usually considered a French borrowing.

THE CHEFS-LIEUX (Figures 9 & 10)

For the sake of clarity, before looking at the full set of *ALW* data points, we will survey the 19 *chefs-lieux*. These points are the largest towns in their respective districts, and they have generally played the role of urban centers for many centuries (Charleroi, as mentioned above, is an exception). Unfortunately, not all the *chefs-lieux* were data points; for those that were not, one of the nearest complete data points was substituted. However, as we have seen several times above, a small geographic distance can translate into no small dialect difference, so we can only very tentatively allow Jumet to stand in for Charleroi, Thuillies for Thuin, Roly for Philippeville, Bouvignes for Dinant, Longchamps for Bastogne, Longlier for Neufchâteau, and Saint-Mard for Virton, as we do here.

For each of the 19 points, Figure 9 gives information for ten words which represent the ten major word classes that potentially yield nasal vowels. The stressed vowel nucleus is given, along with any glides that accompany it. We include a following [n] or [ŋ], with the disclaimer that these segments only appear in pre-vocalic or pre-pausal position (*ALW* I: 79n, 151). Therefore, the fact that they appear in one word and not another cannot necessarily be attributed to a different evolution of the word classes.

In some cases, the *ALW*—and therefore, Figure 9—lists more than one variant for a given word at a particular point; this may be connected with their practice of using more than one informant per locality, but it may also reflect variation within a single informant's speech.

Figure 10 is a map showing the nasal vowel patterns found for the 19 *chefs-lieux* (understood to mean the 12 *chefs-lieux* proper and the 7 nearby points). Here, the data is not limited to the ten key words, but includes all 27 words coded. Only nasal and half-nasal vowels 'earn' a place in the symbol for each point; fully oral vowels are ignored. When a point has a particular nasal vowel quality in two or more words, it is given a line pointing in the appropriate direction on the nine-pointed diagram. But if the vowel occurs in only one word out of the 27, it is given a shorter line to indicate that its potential existence rests upon a single observation.

The map is thus an attempt to suggest the maximum possible phonological subsystem of nasal vowels for each point, as best as this can be done based on the raw phonetic data of the *ALW* (for 27 words). The symbols of Figure 10 do not take phonemic incidence into account at all. Figure 9, on the other hand, considers only ten words, but for these words it shows differences of incidence among the nasal vowels, as well as which word classes may have non-nasal reflexes at a particular point.

Figure 10 can be thought of as a geographically extended version of Figure 8. The patterns are less reliable from the phonological point of view, since the *ALW* did not carry out the type of minimal-pair analysis required to 'prove' that the phonetic difference between any two vowels is significant. Nevertheless, it is reassuring that the same nasal

vowel patterns appear on both maps, and their geographical extent begins to become more clear.

A pattern of three nasals (not counting any front rounded vowels) was described previously for Namur, Spontin, Saint-Hubert, and Tenneville, and by inference for Liège and Malmédy. According to the *ALW*, this pattern, ⊤, is found in **Ath**, **Mons**, **Namur**, **Bouvignes** (near Dinant), **Liège**, **Malmédy**, **Marche**, **Longchamps** (near Bastogne), and **Saint-Mard** (near Virton).

A pattern with two distinct, non-low, front nasal vowels—found previously in Charleroi and Gueuzaine-Weismes, and reported north of Namur—is found in **Jumet** (near Charleroi), **Thuillies** (near Thuin), **Nivelles**, and **Roly** (near Philippeville). In Nivelles there is a fully high front nasal vowel, so the pattern is symbolized ⊹; in the other three points the symbol is ⊤.

A pattern with no distinction between /a/ and /ɔ̃/—observed previously in Oreye and the Faubourg of Charleroi (and to some extent in Neerheylissem)—is found in **Waremme** and **Huy**. In Oreye, the merged vowel was given as /ɑ̃/, but in Waremme and Huy it is /ɔ̃/ that prevails, giving the symbol ‾.

At least before examining phonemic incidence in detail, **Longlier** (near Neufchâteau) shows the same pattern in the *ALW* interview as in Pierret's study; there are three long nasal vowels (⊤) and two short ones (⊓).

Tournai, in the extreme west of the territory, appears to have a single short nasal vowel alongside three long ones, but even the long nasals here are not exactly typical (see below). **Soignies**, also in Hainaut, shows the three-nasal pattern ⊤, except for one word: [fæ̃j] as the reflex of FAME. Although the *ALW* suggests that such forms 'may only be variants' of forms like [fãj] (*ALW* I:151), which are found nearby, our maps will preserve the phonetic distinctions as they were recorded; our symbol is therefore ⊤. It must be noted that the form [pãj], recorded at Soignies for the word PANE 'bread', does tend to support the view that there is no phonemic distinction /æ̃/~/a/. **Verviers** shows up as having a front and a low nasal vowel, but lacking such a vowel in the back: ⊓.

Returning to the data of Figure 9 (the counterpart to Figure 7), we can see the situation in Tournai and Verviers a bit more clearly. In Tournai, a nasal diphthong [ɛ́ɔ̃]—the accent indicates that the first segment is the nucleus—occurs in *PISC+ONE and UMBRA, and the evidence of other words (MANSIONE and RUM(I)CE) supports the assertion that the diphthong is the general reflex of the **oNV** and **o/ɔNC** word classes. The monopthongal [ɔ̃] < HOMO might suggest that the **ɔNV** word class remains distinct, but this is not the case, as the diphthong occurs in BONU (see Appendix). The monophthong in HOMO is more likely due to the proclitic nature of the word, rather than any phonemic distinction.

The phonemic status of Tournai's short nasal vowel [ɛ̃*] could also be seriously doubted, given the additional evidence of the words in the Appendix. For one thing, it

does not appear consistently; in the **e/ɛNC** word class, we have [ɛ̃*] in VENTU, but [ɛ̃] in DENTE. Even more 'suspicious' is that the short vowel always appears before retained nasal consonants (in PŒNA, VENA, SEPTIMANA), which suggests it is an allophonic variant.

In Verviers, we see that not a single fully nasal vowel was recorded; the reflexes are either half-nasals, non-nasals, or both. The phonological status of this variable nasality is very hard to pin down, especially using only *ALW* data. It is possible that the type of variation recorded for VINU—between the half-nasal [ɛ^{n}] and the higher, fully oral [e:]—is really characteristic of several of the other word classes investigated here. The observed difference between half-nasal [ɛ^{n}] in BENE and fully oral [ɛ] in FAME may reflect nothing phonological; perhaps the difference would be reversed if the respondent were to say the two words again.

In his study of Labouxhe, Lechanteur showed that phonetically nasal vowels are not necessarily distinct phonemes, and the same could be true in Verviers. Without minimal-pair tests, the best evidence for the loss of distinctive nasality would be what Lechanteur reported for Labouxhe: nasal vowels appearing in words with no etymological nasal consonant. This type of evidence, which would require an unusually objective fieldworker—or a machine—to accurately record, is lacking here, and so we cannot conclusively state that Verviers lacks phonemic nasal vowels.

According to Lechanteur (quoted above), *ALW* investigators in this eastern area of variability may have been tempted to note a half-nasal vowel in words they knew to correspond to a nasal vowel in Liège. We can imagine then that, inversely, they may have been equally tempted not to record a half-nasal vowel in words which have no nasal consonant etymologically. Although variants were often noted, not every variable form at every point could possibly have been recorded as such. Bearing this in mind, we admit that the methodology of our study becomes rather untrustworthy in Verviers and other points where there are many half-nasals (and non-nasals) in the nasal word classes.

In Malmédy, variability between nasal and non-nasal forms is noted more regularly. The underlying system, however, seems quite similar to that Verviers. At both points, the reflexes of HOMO, LUNIS DIE, and UMBRA appear distinct in two ways: they never show nasality, and they never show a [ŋ] offglide. In both of these respects they are different from *PISC+ONE, and we might wonder if a word class distinction has survived between **ɔNV**, **uN**, **o/ɔNC** on the one hand and **oNV** on the other (as seemed above to be the case in Labouxhe, where [o:] was recorded in words from the other three classes, while the reflex of NOME had [ɔ]). But the three words HOMO, LUNIS DIE, and UMBRA are distinct in other ways: HOMO is never stressed, and LUNIS DIE does not have full stress on the initial, potentially nasal syllable. UMBRA retains a final consonant, so its potentially nasal vowel is in a closed syllable. These differences are sufficient to explain the absence of any offglide, but they do not account for why the vowels are not nasal. Note that VENTU,

which was elicited in a word-final but pre-consonantal context, shows no [ŋ]-glides but does show nasality.

An early study of the eastern part of the province of Liège (Doutrepont and Haust 1892) reveals additional complexity. Doutrepont and Haust investigated a large area that includes Herve, Verviers, and Malmédy, but they describe the dialect of Verviers in particular detail. Introducing their findings on nasal vowels, they write:

> Il n'y a pas en V., non plus qu'en H., de véritables nasales, seulement à H. et à L. on peut formuler un règle génerale assez simple, tandis que le système V. de ces sons est très compliqué. [In Verviers, as in Herve, there are no real nasal vowels, only in Herve and in Liège one can formulate a general rule that is quite simple, while the system of these sounds in Verviers is very complicated.] (26)

In Liège, there are three common nasal vowels, and these are pronounced with full nasalization, 'even with a bit too much affectation' (26). In Herve, there seem to be no nasal vowels at all (28, 29). In Verviers, the treatment of words depends on their word class membership as well as their phonological/prosodic context.

Looking at word class membership, we see that Doutrepont and Haust observe variation, and that some of their results differ from the *ALW*. A possible explanation is that two systems are in competition in Verviers. First, there is a system that probably lacks phonemic nasal vowels, one similar to what Lechanteur described in Labouxhe, where the word classes **iN** and **ɛNV** (and CANE) yield a higher vowel [e:] (28), while **aNV** and **e/ɛNC** yield a low front [æ:] (although **e/ɛNC** gives [ɛ:] before a consonant) (27). The word class **aNC** gives [a:], and the back vowel word classes give [o:] (26).

Just as in Labouxhe, we see that in Verviers only the two low vowels [æ:] and [a:] permit variable or half-nasalization, in what we suggest was the earlier system. Indeed, it may be that the descriptive term 'demi-nasal' [half-nasal] was originally used by Walloon dialectologists to indicate variability, rather than a fixed but intermediate degree of phonetic nasality. Doutrepont and Haust are clear that there is still no nasal back vowel in Verviers—'Le V. ne connaît absolument pas le son *õ* ouvert' [The dialect of Verviers knows absolutely no open [ɔ̃] sound] (26)—and the *ALW* concurs. But in the class of words with [ɛ:], Doutrepont and Haust note change in progress:

> Aujourdhui cependant, la prononciation de *ẽ* semi-nasal tend à s'introduire à V. par influence du français et du liégeois. [Today however, the pronunciation of a semi-nasal [ɛ^{n}] tends to be introduced in Verviers under the influence of French and Liège dialect.] (27)

The *ALW* shows the same thing happening with [e:] (see VINU), and it appears that once nasality affected these word classes, the distinctions between [e:], [ɛ:], and [æ:] were lost. However, the exact state of the phonological system is not clear either before or after the change, because we have no evidence on whether non-etymologically-nasal words were ever nasalized (if so, it would suggest the phonological irrelevance of nasality).

When we consider the phonological/prosodic context, the picture becomes even more complicated. Doutrepont and Haust note that in the area around Verviers, the vowels of our word classes, which are non-nasal or half-nasal before consonants, exhibit a 'guttural resonance' [ŋ] when a vowel or pause follows (28). Marichal observes the same phenomenon in Gueuzaine-Weismes, but there the system of nasal vowels is otherwise robust, and so whatever the context, there is some nasality in the form, whether it be vocalic or consonantal. But in Verviers the form with a velar nasal alternates with a form lacking any nasal segment at all. Translated into IPA notation, the clearest examples of pre-consonantal, pre-vocalic, and pre-pausal forms are the following:

Verviers (Doutrepont and Haust 1892: 28)		Gueuzaine-Weismes (Marichal 1911: 11)
[dʒu m sɔve: be: d lu]	'I remember him **well**'	[lœ mɛ̃ sɔl ta:f] the **hand** on the table'
[vɔz i:ri: bɛŋ avu lu]	'you would go **well** with him'	[lœ mɛŋ ɔl taç] 'the **hand** in the bag'
[o: tʃɛŋ]	'**a dog**'	[lœ mɛ] or (less often) [lœ mɛ̃ŋ] 'the **hand**'

And in Herve, where by all accounts there is no vowel nasality at all, Doutrepont and Haust report a sort of linking [n] being used 'to avoid hiatus'; they contrast pre-pausal [vo:z ale: be:] 'Are you doing well?' with pre-vocalic [bɛn avu] 'well with' (28).

Looked at by itself, the alternation in Gueuzaine-Weismes does not seem particularly problematic. But that found in Verviers and Herve is more so. The theoretical orientation of this study is essentially structuralist, and surface-oriented. We aim to discover the nasal vowel subsystem (if any) at each point and discuss the patterns we find. We might say that Herve has no nasal vowels, while in Gueuzaine-Weismes, or in French for that matter, there is a robust system of them. This would at first glance seem to be a major difference between the phonological systems in the different places. But now we see that Herve agrees with the other varieties in the following respect: a nasal consonant—[n] in Herve and in French, [ŋ] in Verviers—appears when a vowel follows a nasal-class word.

Alternations like the above, are very susceptible to the analyses of classical generative phonology. In the original generative account of French phonology, there are no nasal vowels in underlying representations (Schane 1968: 45-50). That is, French has no nasal vowel phonemes (although a generativist might even reject that term). The final nasal consonants that were pronounced centuries ago are still present in the underlying forms. Much is made of masculine/feminine and other morphological pairs, and a series of rules (which resemble historical changes) is introduced to convert underlying forms (which resemble Old French) into surface, phonetic forms. These rules of vowel nasalization and nasal consonant deletion operate synchronically. Whether these rules refer directly to the nature of the adjacent segments, or interact with word or phrasal stress, might be argued.

In such a framework, nasal-class words would have underlying representations with VN sequences, both in dialects with surface nasal vowels (such as Gueuzaine-Weismes)

and in those without (such as Herve). The rule of nasal consonant deletion could be similar in both dialects; only the rule of vowel nasalization would have to be different.

For three reasons, we will not attempt to use such an abstract phonology. First, still within the framework of rule-based generative phonology, an extensive and meticulous reanalysis of the French data (Tranel 1981: 3-156) convincingly defends the more concrete (and traditional) analysis that French has nasal vowel phonemes. Secondly, rule-based generative phonology itself has recently been attacked as a whole, most notably by the advocates of optimality theory. In the third place, we believe that the surface linguistic diversity in our territory must be described first and foremost, and are unsure whether it is worth it to try to construct additional levels of representation as well as rules or constraints to relate them. Aside from a rather short review article (Keyser 1963), we are unaware of any literature that could serve as a more coherent model for the analysis of this type of geolinguistic variation than those written by Moulton within the framework of structuralist phonology.

A systematic study of the behavior of nasal-class words in different prosodic environments in the dialects of Wallonia could be worthwhile and potentially of theoretical interest, giving more insight on a phenomenon, called *liaison* in French, that has been treated extensively in the phonological literature. But in this study, where our primary source of data is the *ALW*, we have had to rely on a single example of each word, and so we cannot attempt this type of analysis.

To return to Figure 9, we see that in Waremme the word classes **iN** and **ɛNV** have non-nasal reflexes, with a palatal nasal offglide [ɲ] following the vowel. Like the velar nasal [ŋ] found further east and discussed above, it appears in the (stressed) pre-pausal position; consulting Figure 4, we see that VINU and BENE were both elicited at the end of the phrase. We have no evidence about the prevocalic case, where *liaison* might be expected. A note tells us that before consonants, in unstressed position, plain oral vowels appear without any offglide: 'l'on peut dire que *bé*, *bī* sont réguliers à l'atone dans la zone hesbignonne de *bèñ*' [one can say that [be:], [bi:] are the regular unstressed forms in the zone of [bɛɲ] in Hesbaye] (*ALW* I: 79).

Again, a generativist might suggest that a nasal consonant is present underlyingly, that it emerges unchanged in the pre-pausal case, and that it is deleted by a general rule in the pre-consonantal position. But it is interesting that this alternation only occurs in two word classes, and that in **eNV** (RENE) and **aNV** (FAME) a nasal vowel [ɛ̃] appears, even though these words were also elicited in phrase-final (pre-pausal, stressed) position. In a generative framework, no single rule or constraint regarding vowel nasalization would be likely to suffice. We prefer to analyze the situation more concretely and say that in Waremme, most of our word classes have evolved to yield reflexes with (phonemic) nasal vowels, while **iN** and **ɛNV** have evolved so as to retain their VN sequences.

In Longlier, although the pattern of nasal vowels seemed to be the same as in Pierret's study, we see from comparing Figure 7 and Figure 9 that there are some discrepancies in the detail of which vowels appear in which word classes, especially as regards the unusual short nasal vowels. Pierret reports [ɛ̃*] as a variant in the **iN** word class, but the *ALW* does not; the *ALW* finds [ɛ̃*] in VENTU, a member of the **e/ɛNC** class, for which Pierret had found a different vowel quality entirely, whether short [a*] or long [a].

In Saint-Mard, several word classes illustrate differences in phonemic incidence between this dialect, in the extreme south, and most others. The **e/ɛNC** word class shows an oral vowel [a], for the origin of which there are two suggestions in the literature: it could be descended from a short nasal vowel [ɛ̃*] (*ALW* I:127), or it could be a denasalization of [a] (*PALW* I: 8). If the second explanation is true, there would have to be some reason why the word class did not merge with **aNC**; perhaps a length distinction kept them separate before the denasalization of the short vowel. The lowering of [ɛ̃] to [ã] (what we called Change 4 above) is a feature of French whose chronology is somewhat disputed, and it may have included a length distinction at some point (Haudricourt 1947; Martinet 1965).

Another peculiarity at Saint-Mard is the reflex for the word class **aNV**. While the low reflexes at Ath, Soignies, and Nivelles are conservative with respect to the reflex [ɛ̃] found in French and most of the dialects of Wallonia, the [i˙ᵉ] found at Saint-Mard represents a more advanced evolution, indeed a re-diphthongization.

In the east-central part of Wallonia, several points show a reflex [wɛ̃] for the word class **aNV**, but it is important to note that this onglide is not inherent to the word class, to the development of the VN sequence itself, but is related to the initial consonant of the word chosen, FAME. It is the labial consonant [f] which has caused this [w] glide to develop (*ALW* I: 151), in a more or less assimilatory fashion. Another possible choice to exemplify the word class, PANE, shows the same phenomenon, because of its labial consonant [p]. In part, this reflects a limitation in working from atlas data, where only certain particular words are elicited. But it is not as though every possible combination of sounds was an actual Latin word; in general, it is not always possible to find a word that will show a given phonetic development without such complicating, obscuring factors.

Figure 10 shows that four points—Nivelles, Jumet, Thuillies, and Roly (going from north to south)—have two distinct front nasal vowels, one of which is always [ɛ̃] and one of which is a higher vowel ([ĩ] in Nivelles, [e] in the other points). From the purely phonological point of view, these are identical dialects in terms of nasal vowel pattern. But when we examine the word-class detail of Figure 9, we see differences.

In Nivelles, the *ALW* finds the higher front nasal vowel in two word classes, **iN** and **ɛNV**, just like previous studies had shown for Charleroi and Gembloux nearby, and for Gueuzaine-Weismes in a different part of the territory.

In Jumet and Roly, the higher vowel appears in **ɛNV** but not in **iN** (to be precise, it appears in BENE but not in VINU; as will be seen below, the developments generally, but not completely, follow word-class lines). This is somewhat surprising, for it would seem as though **iN** was the more likely candidate to end up with high front nasal vowel, having started out with a high front vowel. Evidently, in these places, the diphthongization of the low-mid vowel in **ɛNV** caused it to end up higher than **iN**.

The diagrams of Figure 10 are derived from all 27 words coded, not just from the ten exemplary word-class words of Figure 9. So in Thuillies, while Figure 10 shows two front nasals in the pattern, Figure 9 does not show any evidence of the higher front nasal vowel at all. By consulting the Appendix, we see that in Thuillies, [ẽ] was noted in CANE (which is part of a small word class) and as a variant in NE GENTE (whose evolution was unique). These words apparently underwent diphthongizations that left them higher than both **iN** and **ɛNV**, at least at this one point.

There is also another way of thinking about these patterns, however. Rather than think of each point's evolution completely independently, we could consider that the lower front nasal vowel [ɛ̃] has replaced the higher vowels in some of these words, as was indeed suggested by Niederländer to have happened in Namur. But in that case, the etymological (word-class) origin of a given word would presumably not play very much of a role in whether or not it was replaced. And if such borrowing and/or diffusion was taking place, the model could have been not only other local dialects, but French itself, at least at a later period, making the situation very complex and difficult to reconstruct.

We also note on Figure 9 that at Soignies, a form with a high front oral vowel is found as the reflex of BENE (**ɛNV**). Since the vowel is not nasal, this higher vowel does not show up on Figure 10. Phonologically, in terms of the pattern of nasal vowels, the dialect of Soignies is equivalent to the common pattern of Liège. But in terms of incidence, **ɛNV** has not lowered and merged with other word classes. And at Mons, where Figure 9 shows the vowel in BENE is the same height as that of VINU, FAME, etc., the vowel is oral and thus the word class is still distinct from the others, which have nasal vowels. This is not represented at all on Figure 10, where the symbol for Mons is identical to that of Namur, Liège, etc. where **ɛNV** has merged with other word classes.

The inspection of the 19 *chefs-lieux* has generally confirmed the findings of the previous studies, and localized more clearly the different patterns of nasal vowels. The area of two distinct front nasal vowels, and the area of merger between [a] and [ɔ̃], call out for further geographical specification, as does the suggestion of length distinctions in two areas. There are also several other phenomena which require us to turn to, and map, the full set of data points. However, we must bear in mind the limitations of our mapping method. Two points with the same symbol have the same pattern of nasal vowels, but their incidence may be different, which signifies a different historical-phonetic evolution.

FIGURE 11: THE BIG PICTURE

As will be the case for most of the remaining figures in this study, Figure 11 presents a wealth of detail that is not all easy to analyze. It is essentially raw data presented in a consistent, almost mechanical way, without much editing or interpretation. We will examine certain phenomena, but others will remain unaddressed. The symbols ~~here~~ here summarize the different nasal vowel qualities found in the 27 words coded; as above, a shorter line means only one word exhibited a given vowel quality, while a longer line represents two or more words. In general, the Appendix should be consulted to accurately interpret—and understand the historical-phonetic origin of—the symbol at any given point. In many cases, the data found there is not sufficient to make a strong case for the phonological reality of a given subsystem.

For example, there are some points, mostly in Luxembourg, that show two back nasal vowel qualities, [ɔ̃] and [õ]. Sometimes (e.g. Ma 4, 20, 36, 39) the higher vowel appears consistently before a nasal consonant, while the lower vowel appears elsewhere. In that case, we are obviously dealing with allophones of the same phoneme. However, it is not always so clear, and it would be worth investigating further whether or not any points in Wallonia have a phonemic distinction among the back nasal vowels—whether inherited (and associated with word class) or newly developed (and independent of word class). Where there are two front nasal vowels, a split in the back would make for a more symmetrical system (⊁). At Na 130, with its high back nasal vowel [ũ], it seems possible that this has occurred, especially as the distinction in the back involves two degrees of height. Other possible one-degree distinctions suggested in these symbols, such as between [i] and [e], [æ̃] and [a], [a] and [ɑ̃], must be considered very tentative.

We have drawn a line marking the eastern boundary of the area with potentially more than one front nasal vowel. There is no way to draw a western limit for this phenomenon, because depending on the word chosen it may extend to the western limit of our territory, as will be seen more clearly below (Figures 16A-I). The front nasal vowel distinction is robust throughout Walloon Brabant, northwest Namur province, and eastern Hainaut. In an area south and west from Nivelles, the distinction is phonetically greater as well, with a fully high nasal vowel (thus ⊀ rather than ⊁).

We have also indicated three areas, lying mainly in the western part of Liège province, where there is no distinction between a low and a back nasal vowel. (The merger has also occurred in a few other single points.) In these places, the **aN**Ɣ word class, which in Wallonia is usually the only source of the low nasal vowel, has fallen together with the various back vowel word classes, which usually yield a back nasal vowel. The perennial question of why this occurred where it did will be addressed under Figure 15.

Five areas are shown where extensive denasalization has occurred—to put it more directly, fewer nasal vowels surface there than elsewhere. Any group of points with

nasality in less than two-thirds of the words (according to a scoring system where half-nasal vowels count with half the weight of fully-nasal vowels) were set off by these lines: there is an area west of Mons, one east of Waremme, one west of Liège, and one in the southeastern part of Luxembourg (comprising most of the *arrondissement* of Virton). In addition, of course, there is the northeastern area of Liège province, including Verviers and Malmédy, where vowel nasalization was already known to be less than robust. Two data points (L 61 and Ve 6) have no symbol at all because they have a nasal vowel score of zero, lacking any trace of nasality according to the records of the *ALW*.

As mentioned above, the phenomenon of denasalization is a complex one, and would merit a more detailed investigation—probably impossible from *ALW* data alone—which would inquire consistently and deeply about the situation at each point, in different phonological/prosodic contexts as well as in words representing the different word classes. The additional fact, which we are surely not the first to note, that two of the main areas of denasalization are adjacent to Germanic-speaking territory—where there are no nasal vowels—raises a interesting historical question, containing issues of language contact and language shift which cannot be addressed in this study.

FIGURE 12: SHORT NASAL VOWELS

The existence of short nasal vowels, and their possible status as separate phonemes, was reported in a previous study of Longlier (Pierret 1984). Figure 12 shows that in Longlier and an area to the east—covering parts of the *arrondissements* of Bastogne, Neufchateau, and Virton—short nasal vowels appear, both front and low. Pierret had suggested that in some communes near Longlier, a full (⊤) pattern of short nasal vowels could be found, but the *ALW* did not record any such pattern. In a small area around Tournai, in the west of Hainaut, a single short front nasal vowel is present. The figure also shows isolated points where short nasal vowels were recorded, usually just one per point, and thus probably phonologically irrelevant.

As with the areas of denasalization, the areas showing evidence of short nasal vowels might merit a further investigation, focused specifically on that phenomenon. The short vowels appear to be correlated with word class, with [ɛ̃*] usually appearing as the reflex of **e/ɛNC** and [ã*] or [ɑ̃] as the reflex of **oNV**. In the area near Tournai, [ɛ̃*] shows up in several other words (BENE, CANE, CINQUE), again keeping those word classes distinct from the common [ɛ̃], in this case by shortness, rather than height or denasalization.

Most, if not all, of the dialects of Wallonia have a solid opposition of long and short oral vowels, so from a strictly phonological point of view it makes sense that the opposition—or feature—of length could be employed among the nasal vowels as well. That short nasal vowels developed so rarely may be due to difficulties in their perception or production, or else it may simply be a result of the vagaries of phonetic evolution.

FIGURE 13: DENASALIZATION BEFORE A NASAL CONSONANT

Up until this point, we have dealt almost exclusively with words in which the nasal vowel—or the potentially nasal vowel—comes at the end of the word in the modern dialects. That is, the final element in the word is the reflex of the VN sequence of Vulgar Latin; any other following consonants, as well as the final vowel, have been lost. Taking forms from the dialect of Liège, an example of the type with no following consonant, historically, is [bɛ̃] from BENE (**ɛNV**); an example with a following consonant is [vɛ̃] from VENTU (**e/ɛNC**). In both, the nasal vowel is now word-final.

When the final vowel in Vulgar Latin was [a], however, the evolution was different. In the Gallo-Romance period, final [a] was only reduced to schwa ([ə]), while all other final vowels were lost. This final schwa, though later lost as well, protected the preceding consonant against deletion. In a case like GAMBA (**aNCa**), with a consonant cluster, the [b] was protected, and the VN sequence developed into, and remained, a nasal vowel: in French, we have [ʒɑ̃b]; in Liège, [dʒãp] (the devoicing of final consonants is common in the dialects of Wallonia). When there was no cluster, but only a single nasal consonant, its retention in final position eventually caused denasalization of the vowel in French and in a few parts of Wallonia, while in most of Wallonia (including Liège) this denasalization did not occur. So SEPTIMANA (**aNa**) yields [samɛ̃n] in Liège; in French, denasalization occurred, and the vowel is now oral: [s(ə)mɛn].

Figure 13 shows where the denasalization has occurred for two words: SEPTIMANA and VENA. In the northeast of Liège province and the south of Luxembourg, there is general denasalization, not just before nasal consonants, so those areas should not be considered to illustrate this more specific phenomenon. It is rather the area in southeastern Hainaut and the *arrondissement* of Philippeville that concerns us. But by comparing the distribution of forms for the two words, we see that they are rather different. Many points have an oral vowel in SEPTIMANA while retaining a nasal vowel in VENA. Therefore, we cannot simply say that the dialects are acquiring a rule of vowel denasalization before nasal consonants, because such a rule would apply to all words. It is equally inaccurate to suggest that the denasalized forms are simply being borrowed, from French for example, because local developments are often preserved alongside the innovative oral vowels: [sɛmwɛn] for SEPTIMANA, [wɛn] for VENA.

It is surely significant, though, that this same area seems to be the most likely to borrow French words. Although some borrowings (as identified by the *ALW*) have spread into larger areas of Wallonia, their geographic patterning suggests that they spread across the border into the *arrondissement* of Thuin, and many are still localized in that area. Some examples of this, from *ALW* I, are *dimanche* 'Sunday', *feuille* 'leaf', *guêpe* 'wasp', *herse* 'harrow', and *tête* 'head'. From a geographic or demographic point of view, however, it is difficult to see why this area of the border would be the most permeable to borrowings.

FIGURE 14: FRONT ROUNDED NASAL VOWELS

Front rounded nasal vowels did not figure in the nine-pointed-star symbols used above, nor did they figure in the discussion. The principal reason is that they are quite rare, and marginal, in the dialects of Wallonia. In French, **uN** developed regularly to [yn] > [yn] > [ø] > [œ̃]. In most of the eastern part of Wallonia, even where [u] eventually fronted to [y], at the time of nasalization it was still a back vowel, and the nasal vowel eventually fell in with other word classes as [ɔ̃] (Remacle 1948: 65-7). Figure 14 shows where front rounded nasal vowels appear as the reflex of LUNIS DIE (a member of the **uN** class). As always, the issue is raised of whether the spatial pattern represents borrowing, diffusion, or 'autochthonous' local development. Although not shown on the map, the pattern of UNU is quite similar, tending to support the view that in these parts of Wallonia—namely, the south of Luxembourg, most of Hainaut and adjacent parts of Brabant and Namur province—the normal development of **uN** was to [œ̃], like in French.

In the eastern area of Wallonia, where the normal reflex of **uN** is [ɔ̃], front rounded nasal vowels do sometimes occur. In virtually every previous study, a few examples are given of borrowings from French where the front rounded nasal vowel is preserved. In other words, the sound [œ̃] is used without assimilation to the native phonology of the dialect, where that nasal vowel does not regularly appear. One explanation is phonological: given the existence of a front rounded series among the oral vowels, a front rounded nasal vowel represented a gap waiting to be filled. Another possibility is that [œ̃] did exist as a native phoneme—and could thus act as a kind of precedent—in a single word: IUNIU.

As shown in Figure 14, many points have front rounded nasal vowels in IUNIU. In the Liège area, the form is [dʒœ̃] while further south and west it is [ʒœ̃]. Previous authors have disagreed regarding this form. One view is that, like the handful of other words with [œ̃], it is a French borrowing (Warnant 1956: 125, 145n). The other is that it is not an ordinary member of the **uN** word class, but that due to its initial palatal glide it developed differently, fronting where other **uN** words did not and developing uniquely (Marichal 1911: 44). Although it is surely rather unusual for a phoneme to develop in one word only, we believe that this is the correct account for two reasons.

First, in all other cases of borrowing, a relatively modern French form was the model, but here it is not the standard French [ʒɥɛ̃] but an older form [ʒœ̃]; and there is the further issue that near Liège it is [dʒœ̃], a form that may have once existed in French, but not at a time where extensive knowledge of French, and therefore potential for borrowing, would have existed in the Liège area.

The second reason why we believe that a front rounded nasal vowel in IUNIU developed as a regular sound change is the spatial pattern of where the vowel occurs. Not only is it present in northeastern areas where very few, if any, of the other French borrowings have

penetrated; it is not even present in those areas where French borrowings are most common. There, the form [ʒɥɛ̃], matching modern French, is found. One could imagine successive waves of borrowing, but this seems unnecessary. The simpler explanation is that the forms with front rounded nasals developed locally as a result of the palatal onglide. When the *ALW* (III, 203) describes this item as 'fortement francisé' ['strongly Frenchified'], it probably only means that the form [ʒɥɛ̃] is the result of borrowing.

FIGURE 15: THE LOW BACK

This study has treated nasal vowels as a separate phonological subsystem, and not dealt with the development or geographic divergences in the oral vowel subsystems. There are two situations in which this narrow focus could be problematic, causing us to miss, or misunderstand, what is happening. One is the case of change across subsystems: for example, in the Francoprovençal dialect of Hauteville (Savoie), Martinet identifies a chain shift involving five elements. From the point of view of the nasal vowels alone, /ɛ̃/ denasalizes while /e/ lowers to /ɛ̃/ and takes its place. Only by looking at the oral vowels as well does one realize that the backing of /a/ to /ɔ/ is the initial trigger, causing the lowering of /ɛ/ to /a/, leaving a hole at the position of /ɛ̃/, which /ɛ̃/ fills by denasalizing (Martinet 1952: 6). This shows that it is sometimes necessary to deal with the oral vowels in order to understand the dynamics of the nasal vowels, something that was not even attempted in this study.

The change in Hauteville occurred well after the development and phonologization of nasal vowels. When looking at developments that happened longer ago, it may be necessary to consider oral vowels to fully understand the nasals, for a different reason. Rather than there being change across subsystems, since nasal and oral vowels were allophones of phonemes in the same subsystem, changes in one might be similar or identical to changes in the other.

Figure 15 shows the nasal vowel patterns just as in Figure 11, but circling the points where a nasal vowel distinction has been lost, and there are only two nasal vowels (not counting any front rounded nasals, as usual). The merged nasal vowel is phonetically [ɔ̃] in all points except one. The exception is Oreye (W 13), where the merged vowel is [ɑ̃]. The fact that Warnant (1956) reports the same vowel quality [ɑ̃] should not be seen as confirming this anomalous *ALW* observation, because Warnant himself was the atlas fieldworker for that point, his hometown (*ALW* I: 41). On the other hand, there is no real reason to doubt the accuracy of the observation.

In most cases, though, it seems as though the nasal [ã] has backed and rounded, merging with [ɔ̃]. Since one also observes, in the same general area, various degrees of backing and rounding affecting the oral vowel [a], which reaches [o] in the area around Verviers), it is natural to enquire about the relation between the two backing changes.

In Figure 15, the territory is shaded to represent the vowel quality in CARRU, which is pronounced [ʃar], [ʃɑr], [ʃɔr], or [ʃor] (from lighter to darker shading). Outside the center of the figure, this backing change does not seem to be relevant. The vowel is universally [o] towards Namur, to the west of the focus area, and universally [a] towards Malmédy, to the southeast of the focus area.

In the focus area, against the background of CARRU, we can then observe the nasal vowel pattern, specifically the quality of the low nasal vowel, and whether it is merged or not with the back nasal vowel. Without using statistics to confirm the point, there does seem to be a relationship between the two:

[a] in CARRU	10 points	9 of which show backing	3 of these are merged
[ɑ] in CARRU	50 "	32 "	20 "
[ɔ] in CARRU	14 "	3 "	1 "
[o] in CARRU	7 "	0 "	0 "

Looking at the map itself, the relationship is more clear. But it is not as we initially suspected. The two changes were not one and the same—they may have been independent historically, or even correlated negatively in some way—but their effects overlapped and interacted. Where CARRU is not backed at all, remaining [a], there is backing of the nasal vowel. Where CARRU is maximally backed and rounded, becoming [o], there is no backing of the nasal vowel (Remacle 1992: 101 draws an interesting conclusion from this observation). But where each change was slight, it created the potential for merger among the nasal vowels. How (and why) this happened is not clear.

FIGURES 16A-I: THE FRONT NASAL VOWEL DISTINCTION

The final topic to be examined here is perhaps the richest of all. Perhaps this is only because of our French-centered perspective: the absence of a distinction found in French, such as the merger treated above, is something that could have been predicted in advance, while the presence of a distinction not found in French seems exciting and exotic. Aside from that appeal, the front nasal vowel distinction—between a more common [ɛ̃] and a higher [ẽ] or [i]—was previously described in studies of several points, and adding the data of the *ALW* only deepened and broadened the interest of the issue.

The higher nasal vowel is most likely to be the reflex of the **ɛNV** word class, with the **iN** word class showing it in a smaller area. This much was known from the work of Grignard (1908), who drew one simplified map of the phenomenon. Our figures 16A-16I show the situation in more detail, presenting individual words separately. The marginal word class **C'aNV** seems to yield the higher nasal vowel in a larger territory than the above word classes, and the unique NE GENTE shows its own spatial pattern (note that since some parts of Wallonia use a different morpheme for negation, NE GENTE was not elicited everywhere).

Still, the similarity found in the comparison of certain items (for example, Figure 16C, of CINQUE and Figure 16I, of VINU, both in the **iN** word class) reassures us that the word class model is a valid way to approach the phenomenon. That is, when the raw data is presented at the level of fine detail that the *ALW* provides, no two words will appear exactly alike, but the differences found between two words of the same word class will always be of lesser magnitude than those found when two words from different word classes are compared.

Because of the fine detail recorded by the *ALW*, and presented in our figures with full focus on the relevant vowel (as opposed to the maps in the *ALW* itself, which are often designed to illustrate consonantal changes), there is more interesting information presented in Figures 16A-16I than we have space, or enough understanding, to discuss. From a phonological point of view, we might first ask whether the higher nasal vowel constitutes a distinct phoneme in the far west of Hainaut, where it only appears in CANE (and presumably other words of that small class). In Walloon Brabant, eastern Hainaut, and western Namur province, its status as a separate phoneme seems undeniable.

The higher nasal vowel in these cases is (or at least was) subject to denasalization, which may be variable, or even depend on functional considerations as suggested by Bal for Charleroi, but is also geographically patterned within the larger territory of the front nasal distinction. Once high front oral vowels are seen as part of the same phenomenon, it becomes worthwhile to look at the **e/ɛNC** word class as well, which never shows high front nasal vowels anywhere but does show high front oral vowels in the area surrounding Ath. Depending on the point, the word class either falls in with **ɛNV** or remains distinct, because **ɛNV**, surely by no coincidence, tends to emerge as a front rounded nasal vowel in exactly that area.

Although it would always be an improvement to have more examples of each word class, we can say that the phenomenon of front nasal vowel distinctions is one which the *ALW* does illustrate rather well, although there are always questions of variation which atlas data cannot answer. For example, Bal suggested that in Charleroi the higher nasal vowel can be partially denasalized ('when it fills no distinctive function'); we might ask, inversely, whether the high front oral vowels found mianly in central Hainaut (and south of Philippeville) can sometimes be nasalized, and if so, how best to formalize the difference between those dialects.

It is almost conventional to suggest that once an interesting phenomenon has been identified from atlas data, it could be studied further in the field. Indeed, Lechanteur's dream of a 'geographic phonology' of Wallonia was to be achieved by using the *ALW* as a mere jumping-off point. But despite the popularity of the recent movement fostering pride in and promoting the use of the dialects (http://www.wallonie.com/wallang/wal-txt.html has several sound recordings of the Lord's Prayer; in the phrase meaning 'and

lead us **not** into temptation' one can hear the reflex of NE GENTE, which is [ɛ̃] in one dialect and a notably high, if incompletely nasalized, [e] in another), despite the continued vitality of the dialects in more rural areas of Wallonia, the passing of the twentieth century has not left these dialects intact enough, especially in the more urban and industrial areas, to restudy them as if one were studying the same thing as the *ALW*.

Fortunately enough, however, certain particularities of the local dialects have been carried over into the French that is now more commonly spoken. The front nasal vowel distinction is utilized in the regional French of Charleroi, 'mais seulement dans quelques mots sentis nettement comme des emprunts wallons' ['but only in a few words that are clearly felt to be Walloon borrowings']. The examples given are [nɛ̃ʲ] (< NE GENTE) and [bɛʲ] (< BENE), with some diphthongization. But even these forms 'sont souvent francisées davantage' ['are more often Frenchified'] into [nɛ̃], [bɛ̃] (De Reuse 1987: 107). The informant who produced these forms had a passive knowledge of the local dialect. As the process of language shift continues, it remains to be seen whether the higher front nasal vowel will be integrated into the phonology of that variety of regional French, or whether it will be lost.

A study of the regional French of Herve shows that vowel denasalization (as compared to standard French; we might also say non-nasalization) has persisted from the local dialect. But whereas in the local dialect, the nasal word classes had fallen in with some of the oral vowels already present from other sources, in the regional French the 'denasalized' vowels are said to remain distinct from any other oral vowels, even though this requires a system with five degrees of vowel aperture in both front and back. Length distinctions, possibly significant, are also brought over into this variety of regional French, in a manner that is not fully explained in a study that is more acoustic-phonetic than phonological (Detry 1985).

It has also been reported that the merger between [ã] and [õ], in the area of Waremme and Huy, is another nasal vowel phenomenon that has been transferred to the regional French now spoken there (Blampain et al. 1987: 169). Many questions are raised, both formal and sociolinguistic, by these indications that although speakers are shifting from a local dialect to a standard language, they are preserving many phonological characteristics of those original dialects, intentionally or not. Even though much linguistic diversity is lost every time a local dialect goes into extinction, the diversity of the living French language—if such an entity is considered to exist, a notion which might be challenged by generative linguists—is increased by some small fraction in return.

This is certainly not to say that we did all one could in this study to describe and analyze the nasal vowels of Wallonia using the *Atlas Linguistique de la Wallonie*. But we hope that many of our findings will be of interest, and also that our data (as presented in our Figures as well as our Appendix) will be of use to future investigators.

WORKS CONSULTED

Thanks to Nyesia Turner who assisted in the preparation of this section.

ALW = *Atlas linguistique de la Wallonie.*
Tome I: Aspects phonétiques. Louis Remacle, ed. Liège: Vaillant-Carmanne, 1953.
Tome II: Aspects morphologiques. Louis Remacle, ed. Liège: Vaillant-Carmanne, 1969.
Tome III: Les phénomènes atmosphériques et les divisions du temps. Elisée Legros, ed. Liège: Vaillant-Carmanne, 1955.
Tome IV: La maison et le ménage (1re partie). Jean Lechanteur, ed. Liège: Vaillant-Carmanne, 1976.
Tome V: La maison et le ménage (2e partie). Jean Lechanteur, ed. Liège: Vaillant-Carmanne, 1991.
Tome VIII: Les plantes, les animaux, et la terre (3e partie). Marie-Guy Boutier, ed. Liège: Vaillant-Carmanne, 1994.
Tome IX: La ferme, la culture, et l'élevage (1re partie). Eliseé Legros and Marie-Thérèse Counet, eds. Liège: Vaillant-Carmanne, 1987.
Tome XV: Le corps humain et les maladies (2e partie). Marie-Guy Boutier, ed. Liège: Vaillant-Carmanne, 1997.

Astronomical Society of Liège (Sociéte Astronomique de Liège). "Latitude & longitude de 2735 localités belges." http://www.astro.ulg.ac.be/~sal/coord.htm.

Bal, Willy. 1966. "Le parler wallon de Charleroi. Eléments d'une déscription phonologique." In *Caroloregium valde concelebratur 1666-1966.* Charleroi: Administration communale, 221-226.

Blampain, Daniel, et al. 1997. *Le français en Belgique: une langue, une communauté.* Liège: Duculot.

Bonnard, Henri. 1975. *Synopsis de phonétique historique.* Paris: SEDES.

Dauzat, Albert et al. 1964. *Nouveau dictionnaire étymologique et historique.* Paris: Larousse.

de Reuse, Willem J. 1987. "La phonologie du français de la région de Charleroi (Belgique) et ses rapports avec le wallon." *Linguistique* 23, 99-115.

De Ruijg, Willem Andries. 1949. *Phonétique et morphologie du patois de Neerheylissem.* Amsterdam: Duwaer.

Detry, Chantal. 1985. "Les voyelles dénasalisées du français de Herve." *Cahiers de l'Institut de Linguistique de Louvain* 11.1-2, 107-124.

Doutrepont, Georges and Jean Haust. 1892. "Les parlers du Nord et du Sud-Est de la province de Liège." In *Mélanges wallons.* Liège: Vaillant-Carmanne.

Francard, Michel. 1980. *Le parler de Tenneville: Introduction à l'étude linguistique des parlers wallo-lorrains.* (Bibliothèque des Cahiers de l'Institut de Linguistique de Louvain, 19.) Louvain-la-Neuve: Cabay.

Grignard, Adelin. 1908. "Phonétique et morphologie des dialectes de l'Ouest-wallon." *Bulletin de la Société Liégeoise de Littérature Wallonne* 50, 375-521.

Haudricourt, André and Alphonse Juilland. 1970. *Essai pour une histoire structurale du phonétisme français*. 2nd ed. The Hague: Mouton.

Keyser, Samuel J. 1963. Review of H. Kurath and R.I. McDavid, Jr., *The Pronunciation of English in the Atlantic States*. *Language* 30, 303-316.

Lechanteur, Jean. 1973. "Déscription phonologique d'un patois hervien." *Bulletin de la Commission Royale de Toponymie et Dialectologie* 47, 161-191.

Li Ranteule. "The Walloon language page." http://www.wallonie.com/wallang/

Lodge, R. Anthony. 1993. *French: from dialect to standard*. London: Routledge.

Marchot, Paul. 1892.s *Phonologie détaillée d'un patois wallon*. Paris: Émile Bouillon.

Marichal, Johann Joseph. 1911. *Die Mundart von Gueuzaine-Weismes*. Inaugural-Dissertation, University of Bonn. Bonn: Carl Georgi.

Martinet, André. 1952. "Function, structure, and sound change." *Word* 8, 1-32.

Martinet, André. 1965. "Les voyelles nasales du français." *Linguistique* 2, 117-122.

Matte, Édouard Joseph. 1984. "Réexamen de la doctrine traditionnelle sur les voyelles nasales du français." *Romance Philology* 38, 15-31.

Moulton, William G. 1960. "The short vowel systems of Northern Switzerland." *Word* 16: 155-182.

Moulton, William G. 1962. "Dialect geography and the concept of phonological space." *Word* 18: 23-32.

Moulton, William G. 1968. "The mapping of phonemic systems." In *Verhandlungen des zweiten internationalen Dialektologenkongresses, II*, Ludwig Erich Schmidt, ed. (Zeitschrift für Mundartforschung, Beihefte, neue Folge, 4.) Wiesbaden: Steiner, 574-591.

Niederländer, J. 1899. "Die Mundart von Namur." *Zeitschrift für romanische Philologie* 24, 1-32, 251-309.

PALW = *Petit atlas linguistique de la Wallonie*.
Tome I: 20 cartes et commentaires. Liège: Institut de dialectologie wallonne, 1990.
Tome II: 20 cartes et commentaires. Liège: Institut de dialectologie wallonne, 1992.

Pierret, Jean-Marie. 1984. "Déscription phonologique du parler de Longlier [Ne 47]." *Cahiers de l'Institut de Linguistique de Louvain* 9.1-2, 169-184.

Remacle, Louis. 1948. *Le problème de l'ancien wallon*. (Bibliothèque de la Faculté de Philosophie et Lettres de l'Université de Liège, 109.) Liège: Faculté de Philosophie et Lettres.

Remacle, Louis. 1992. *La différenciation dialectale en Belgique romane avant 1600*. (Bibliothèque de la Faculté de Philosophie et Lettres de l'Université de Liège, 256.) Genève: Droz.

Rochet, Bernard L. 1976. *The Formation and Evolution of the French Nasal Vowels.* (Zeitschrift für romanische Philologie, Beihefte, 153.) Tübingen: Niemeyer.

Ruhlen, Merritt. 1979. "On the Origin and Evolution of French Nasal Vowels." Review article of Rochet 1976. *Romance Philology* 32, 321-335.

Schane, Sanford. 1968. *French phonology and morphology.* Cambridge, MA: MIT Press.

Tranel, Bertrand. 1980. *Concreteness in generative phonology: evidence from French.* Berkeley: University of California Press.

Van Kerchove, Luc. 1975. "Essaie de déscription de la morphologie verbale du parler de Spontin." *Bulletin de la Commission Royale de Toponymie et Dialectologie* 49, 269-326.

Warnant, Léon. 1956. *La constitution phonique du mot wallon: Étude fondée sur le parler d'Orèye (Hesbaye liégeoise).* (Bibliothèque de la Faculté de Philosophie et Lettres de l'Université de Liège, 135.) Paris: Les Belles Lettres.

There are three other books which came to our attention too late to be properly consulted and integrated into our study. These are:

Posner, Rebecca. 1997. *Linguistic Change in French.* Oxford University Press.

Sampson, Rodney. 1999. *Nasal Vowel Evolution in Romance.* Oxford University Press.

Wüest, Jakob. 1979. *La dialectalisation de la Gallo-Romania.* Bern: A. Francke.

Classical Latin	i:	i e:	e	a a:	o	o: u	u:			
Vulgar Latin	i	e	ɛ	a	ɔ	o	u			
	iN	eNV	ɛNV	aNV	ɔNV	oNV	uN	e/ɛNC	aNC	o/ɔNC
4th										
5th										
6th			ie	ae	uo					
7th		ei				ou				
				aɛ						
8th							y			
9th				ai						
10th		eĩ	iɛ̃	aĩ					ã	
								ɛ̃		
11th					ue	õũ		ã		
					uɛ̃	õõ				
12th		ɛ̃ĩ	jɛ̃	ɛ̃ĩ	wɛ̃†	õ				õ
	ĩ									
13th	ɛ̃	ɛ̃		ɛ̃		ɔ̃				ɔ̃
							ỹ			
14th							œ̃			
15th										
16th										
17th								[ã]	[ã]	
18th										
19th										
20th century										

[ ] not given in source, added by DEJ [†] extinct line of development

FIGURE 1: 'Traditional' Chronology of the Evolution of the French Nasal Vowels
(after Dauzat 1964, Bonnard 1975)

Classical Latin	i:	i e:	e	a a:	o	o: u	u:			
Vulgar Latin	i	e	ɛ	a	ɔ	o	u			
	iN	eNV	ɛNV	aNV	ɔNV	oNV	uN	e/ɛNC	aNC	o/ɔNC
4th										
5th										
6th										
7th										
8th										
9th	ĩ	ẽ̀i	ĭẽ	ã̀i	úõ	õ	ỹ	ẽ	ã	ɔ̃
10th										
11th										
12th					uɛ̃́†					
13th		ẽi	iẽ́	ɛ̃i		ũ?		ã		ũ?
14th										
15th										
16th		ɛ̃	jɛ̃	ɛ̃						
	ẽ					õ	œ			õ
17th										
	ɛ̃							ã̀	ã̀	
18th										
19th										
20th century										

[ ] not given in source, added by DEJ [†] extinct line of development

FIGURE 2: 'Revised' Chronology of the Evolution of the French Nasal Vowels
(after Rochet 1976, Ruhlen 1979)

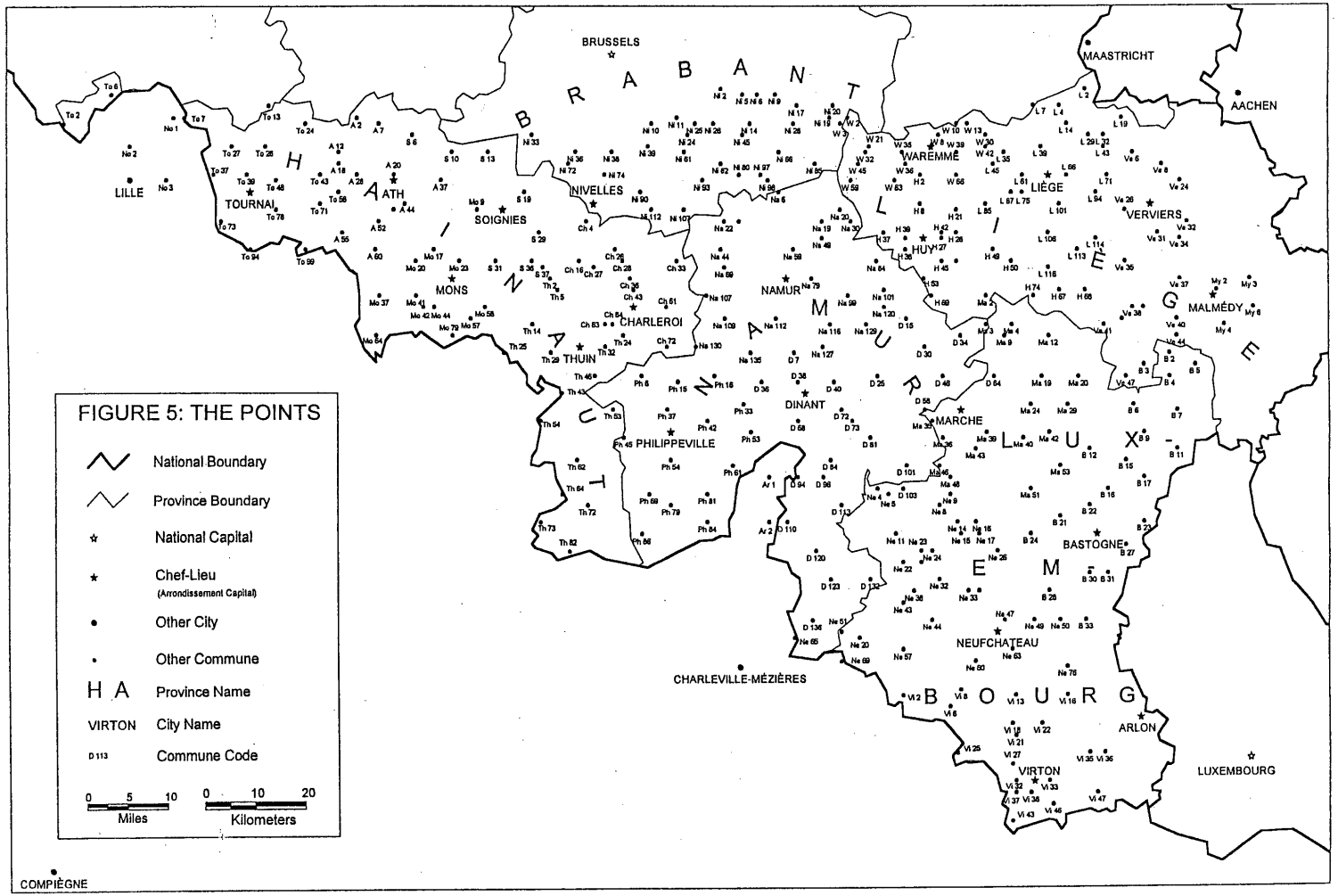
Classical Latin	i:	i e:	e	a a:	o	o: u	u:			
Vulgar Latin	i	e	ɛ	a	ɔ	o	u			
	iN	eNV	ɛNV	aNV	ɔNV	oNV	uN	e/ɛNC	aNC	o/ɔNC
4th			iɛ		uɔ		y			
5th										
6th		ei		æɛ		ou				
									æ̃	
7th								ẽ		õ
	î	ẽî	[îɛ]	æ̃î	[ũɔ]†	õũ	ỹ			ũ
8th									ɛ̃	
9th		ɛ̃î		ɛ̃î						
10th										
11th										
12th										
13th									æ̃	
14th		ɛ̃ɛ̃		ɛ̃ɛ̃				ɛ̃		
15th	ẽî								ã	
		ɛ̃ɛ̃		ɛ̃ɛ̃		õõ				õ
16th	ẽẽ						ø̃	æ̃		
		ɛ̃	[jɛ̃]	ɛ̃					ɑ̃	
17th	ɛ̃					ɔ̃		ã		ɔ̃
							œ̃			
18th								ɑ̃		
19th										
20th century										

[ ] not given in source, added by DEJ [†] extinct line of development

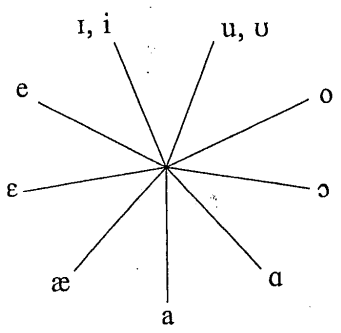
FIGURE 3: 'Revolutionary' Chronology of the Evolution of the French Nasal Vowels (after Matte 1984)

Class	Latin	French	English	Tome	Notice	Question
aNC	ANNU	an	year	III	105	... au bout d'un an
aNj	BALNEU	bain	bath	XV	140	prendre un bain
ɛNV	BĔNE	bien	well	I	3	pesez-moi bien ...
ɔNV	BŎNU	bon	good	XV	161	du thé, c'est souverain pour le sang
C'aNV	CANE	chien	dog	I	18	appelez votre chien
iN	CĪNQUE	cinq	five	I	19	je sortirai vers cinq heures
e/ɛNC	DĔNTE	dent	tooth	I	27	j'ai une dent cariée...
aNV	FAME	faim	hunger	I	39	mange, puisque tu as faim
aNC	GAMBA	jambe	leg	I	52	j'ai mal à la jambe
ɔNV	HŎMO	on	one	II	46	on va l'enterrer; on la chauffera; etc.
uNj	IŪNIU	juin	June	III	113	(les noms des douze mois)
iNj	LĪNEU	linge	laundry	V	64	laver le linge sale
uN	LŪNIS DIE	lundi	Monday	III	122	(les noms des sept jours)
oNV	MANSIŌNE	maison	house	I	56	une maison bien tenue
[unique]	NE GĒNTE	[nient]	not	II	75	... pour ne pas nous plaindre
oNV	*PISC+ŌNE	poisson	fish	I	76	poisson
eNA	PŒNA [PĒNA]	peine	pain	I	69	qui voit ses veines voit ses peines
eNV	RĒNE	rein	kidney	XV	108	j'ai un tour de reins
o/ɔNC	RŬM(I)CE	ronce	thorn	I	84	une touffe (de ronces, de fougère)
aNA	SEPTIMANA	semaine	week	I	90	il partit au bout d'une semaine
iNj	SĪMIU	singe	monkey	VIII	22	singe
e/ɛNC	SĬNGULARE	sanglier	boar	VIII	26	sanglier
o/ɔNC	ŬMBRA	ombre	shade	III	96	se mettre à l'ombre, à l'abri du soleil
uN	ŪNU	un	one	II	8	j'en ai un, une, deux..
eNA	VĒNA	veine	vein	I	97	qui voit ses veines voit ses peines
e/ɛNC	VĔNTU	vent	wind	III	67	le vent fait plier les arbres
iN	VĪNU	vin	wine	IV	189	un baril plein de vin

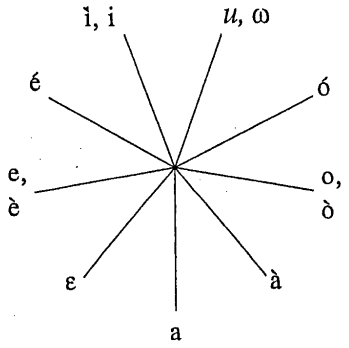
FIGURE 4: The Words


BRUSSELS
MAASTRICHT
AACHEN
BRABANT
HAINAUT
LIÈGE
LUXEMBOURG
LILLE
TOURNAI
ATH
SOIGNIES
NIVELLES
WAREMME
VERVIERS
HUY
MONS
CHARLEROI
NAMUR
MALMÉDY
THUIN
DINANT
MARCHE
PHILIPPEVILLE
BASTOGNE
NEUFCHATEAU
CHARLEVILLE-MÉZIÈRES
ARLON
VIRTON
COMPIÈGNE
FIGURE 5: THE POINTS
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other City
Other Commune
H A Province Name
VIRTON City Name
D 113 Commune Code
0 5 10 Miles
0 10 20 Kilometers

IPA Notation



ALW Notation



Coding Notation

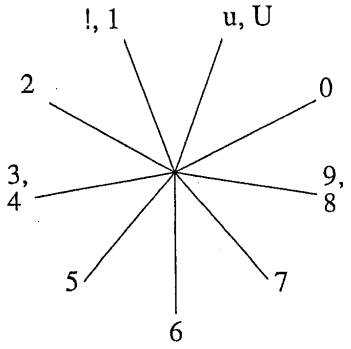
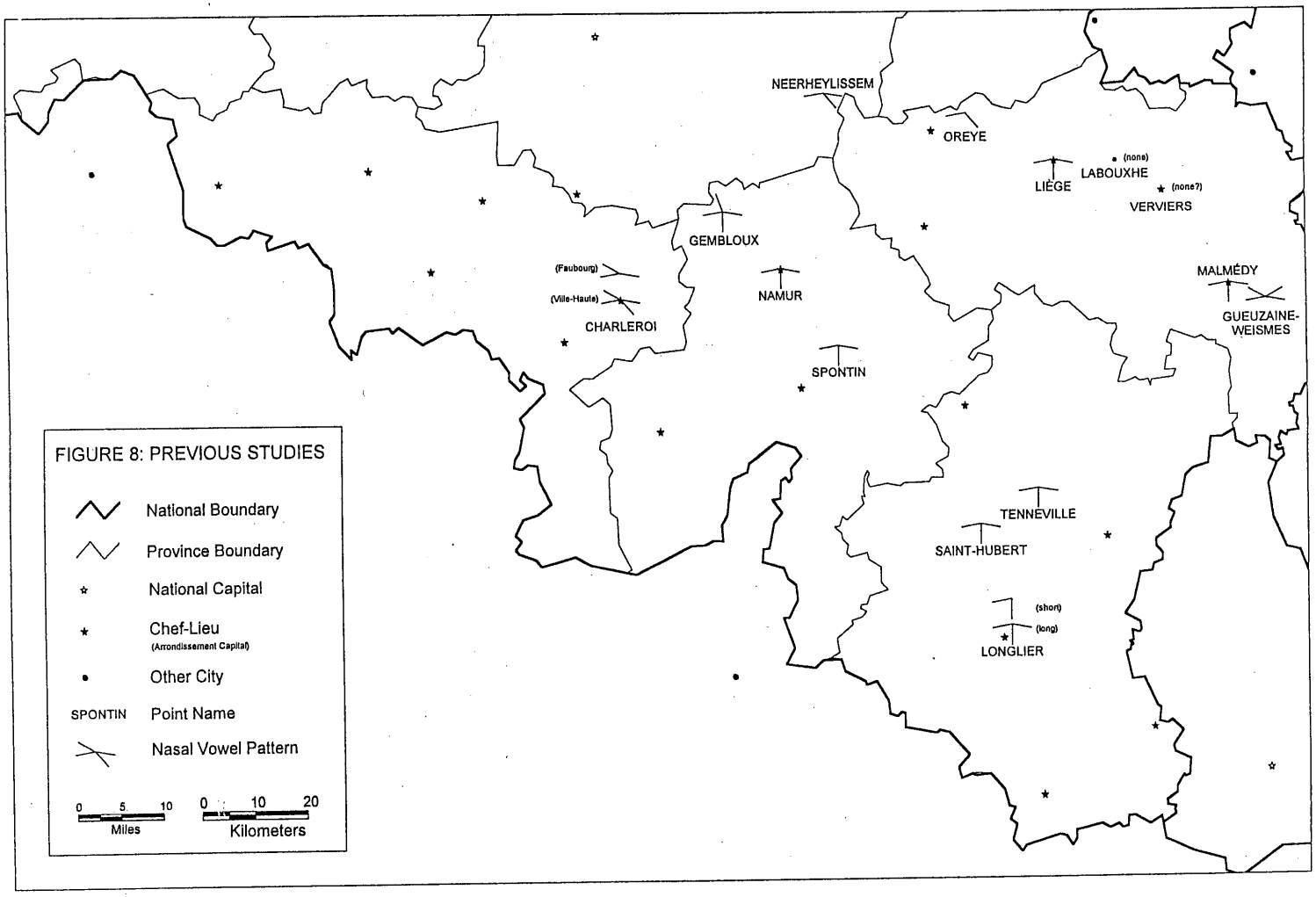


FIGURE 6: THE SYMBOLS

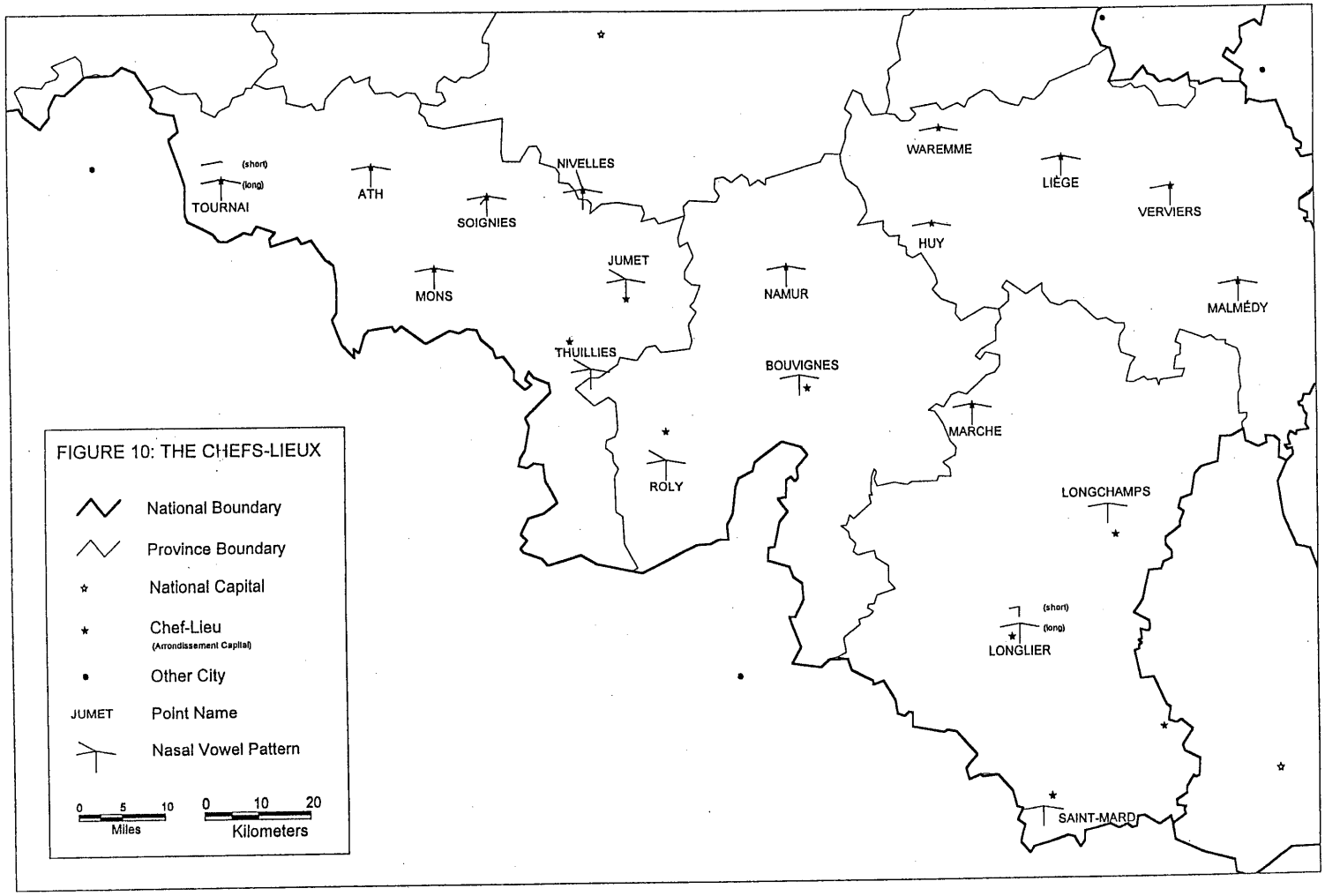
	iN	eNV	ɛNV	aNV	ɔNV	oNV	uN	e/ɛNC	aNC	o/ɔNC
Phonological Studies:										
Charleroi [Ch 1]	ẽ	ɛ̃	ẽ				ɛ̃/œ̃	ɛ̃	ɑ̃/ɔ̃	ɔ̃
Bal 1966										
The Ville-Haute has a contrast between ɑ̃ and ɔ̃, while the Faubourg tends to merge the two as ɔ̃.										
Spontin [D 12]							œ̃	ɛ̃	ã	ɔ̃
Van Kerchove 1975										
While primarily morphological, this study includes a diagram showing a four-nasal system.										
Oreye [W 13]	ɛ̃			ɛ̃		ɑ̃	ɑ̃/œ̃	ɛ̃	ɑ̃	ɑ̃
Warnant 1956										
Labouxhe [L 71]	e:	æ:	e:	æ:	o:	ɔ	o:/ø:	æ:	a:	o:
Lechanteur 1973										
The low vowels [æ:] and [a:] are variably nasalized. There are no phonemic nasal vowels.										
Tenneville [Ma 51]	ɛ̃	ɛ̃	ɛ̃	ɛ̃	ɔ̃	ɔ̃	ɔ̃/œ̃	ɛ̃	ã	ɔ̃
Francard 1980										
Longlier [Ne 47]	ɛ̃/ɛ̃*			ɛ̃	ɔ̃	ã*	?/œ̃	ã/ã*	ã/ã*	ɔ̃/ã*
Pierret 1984										
Only a few very old speakers have short ɛ̃* in their system, while some younger speakers have lost short ɑ̃*. The phoneme œ̃ is described as rare, but no other reflexes of uN are given.										
Historical-Phonetic Studies:										
Gueuzaine-Weismes	ẽ	ɛ̃	ẽ	ɛ̃	õ	õ	õ	ɛ̃	ɔ̃	õ
Marichal 1911										
Verviers [Ve 1]	e:		e:	æ:^{n}	o:	o:	o:	æ:^{n}	a:^{n}	o:
Haust & Doutrepont 1892										
Neerheylissem[Ni 20]	ɛ̃	ɛ̃	ɛ̃	ɛ̃	ɔ̃	ɔ̃	ɔ̃	ɛ̃	ɑ̃/ɔ̃	ɔ̃
De Ruijg 1949										
Namur [Na 1]	ɛ̃	ɛ̃	ɛ̃	ɛ̃	ɔ̃	ɔ̃	ɔ̃/œ̃	ɛ̃	ã	ɔ̃
Niederländer 1900										
Malmédy [My 1]	”	”	”	”	”	”	”	”	”	”
Marichal 1911										
Saint-Hubert [Ne 16]	”	”	”	”	”	”	”	”	”	”
Marchot 1892										
These three dialects all show the same pattern, which is also that of Liège (Lechanteur 1973).										

FIGURE 7: Tableau of Reflexes of VN in the Dialects Previously Studied in Wallonia


NEERHEYLISSEM
OREYE
LIÈGE
LABOUXHE
(none)
(none?)
VERVIERS
GEMBLOUX
(Faubourg)
(Ville-Haute)
CHARLEROI
NAMUR
MALMÉDY
GUEUZAINE-
WEISMES
SPONTIN
TENNEVILLE
SAINT-HUBERT
(short)
(long)
LONGLIER
FIGURE 8: PREVIOUS STUDIES
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other City
SPONTIN
Point Name
Nasal Vowel Pattern
0 5 10
Miles
0 10 20
Kilometers

	iN VĪNU	eNV RĒNE	ɛNV BĔNE	aNV FAME	ɔNV HŎMO	oNV *PISC+ŌNE	uN LŪNIS DIE	e/ɛNC VĔNTU	aNC ANNU	o/ɔNC ŬMBRA
Tournai	ɛ̃	ɛ̃	ɛ̃	ɛ̃	ɔ̃	éɔ̃	ɛ̃*	ɛ̃*	ã	éɔ̃
[To 1] Ath	ɛ̃	ɛ̃	jœ	ɛ̃/ãɲ	ɔ̃	ɔ̃	œ̃	e:	ã	ɔ̃
[A 1] Mons	ɛ̃		ɛ	ɛ̃	ɔ̃	ɔ̃	œ̃	ɛ̃	ã	ɔ̃
[Mo 1] Soignies	ɛ̃	ɛ̃	i·	æ̃j	ɔ̃	ɔ̃	œ̃	ɛ̃	ã	ɔ̃
[S 1] Jumet	ɛ̃		e^n	wɛ̃	ɔ̃	ɔ̃	ɛ̃	ɛ̃	ã	ɔ̃
[Ch 43] Thuillies	ɛ̃	ɛ̃	ɛ̃ŋ	ɛ̃	ɔ̃	ɔ̃	œ̃	ɛ̃	ã	ɔ̃
[Th 46] Nivelles	i^n/ĩŋ	ɛ̃	ĩ	ãɲ	ɔ̃	ɔ̃	œ̃	ɛ̃	ã	ɔ̃
[Ni 1] Namur	ɛ̃	ɛ̃	ɛ̃	wɛ̃	ɔ̃	ɔ̃	ɔ̃	ɛ̃	ã	ɔ̃
[Na 1] Roly	ɛ̃	ɛ̃	e^n	wɛ̃	ɔ̃	ɔ̃	œ̃	ɛ̃	ã	ɔ̃
[Ph 54] Bouvignes	ɛ̃	ɛ̃	ɛ̃	wɛ̃	ɔ̃	ɔ̃	ɔ̃	ɛ̃	ã	ɔ̃
[D 38] Waremme	ɛɲ	ɛ̃	ɛɲ	ɛ̃	ɔ̃	ɔ̃	ɔ̃	ɛ̃	ɔ̃	ɔ̃
[W 1] Huy	ɛ̃	ɛ̃	ɛ̃	wɛ̃	ɔ̃	ɔ̃	ɔ̃	ɛ̃	ɔ̃	ɔ̃
[H 1] Liège	ɛ̃	ɛ̃	ɛ̃	ɛ̃	ɔ̃	ɔ̃	ɔ̃	ɛ̃	ã	ɔ̃
[L 1] Verviers	$ɛ^n$ŋ/e:		$ɛ^n$ŋ	ɛŋ	o:	ɔŋ	o:	$ɛ^n$	a^nŋ	o:
[Ve 1] Malmédy	$ɛ^n$ŋ	ɛ̃ŋ	$ɛ^n$ŋ/ɛ:	$ɛ^n$ŋ	ɔ:	$ɔ^n$ŋ	ɔ:	$ɛ^n$/ɛ:	a^nŋ/a:	ɔ:
[My 1] Marche	ɛ̃	ɛ̃	ɛ̃	wɛ̃	ɔ̃	ɔ̃	ɔ̃	ɛ̃	ã	ɔ̃
[Ma 1] Longchamps	ɛ̃	ɛ̃	ɛ̃	wɛ̃	ɔ̃	ɔ̃	ɔ̃		ã	ɔ̃
[B 22] Longlier	ɛ̃	ɛ̃	jɛ	ɛ̃	ã	ã*	œ̃	ɛ̃*	ã	ɔ̃
[Ne 47] Saint-Mard	ɛ̃		ɛ̃	$i·^e$	ɔ̃	ɔ̃	ɛ̃	a	ã	ɔ̃
[Vi 38]										

FIGURE 9: Tableau of Reflexes of VN in the Dialects of the *Chefs-Lieux* of Wallonia (or points nearby), according to the *Atlas Linguistique de la Wallonie*


(short)
(long)
TOURNAI
ATH
NIVELLES
SOIGNIES
MONS
JUMET
THUILLIES
ROLY
NAMUR
BOUVIGNES
WAREMME
LIÈGE
VERVIERS
HUY
MALMÉDY
MARCHE
LONGCHAMPS
(short)
(long)
LONGLIER
SAINT-MARD
FIGURE 10: THE CHEFS-LIEUX
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other City
JUMET
Point Name
Nasal Vowel Pattern
0 5 10
Miles
0 10 20
Kilometers

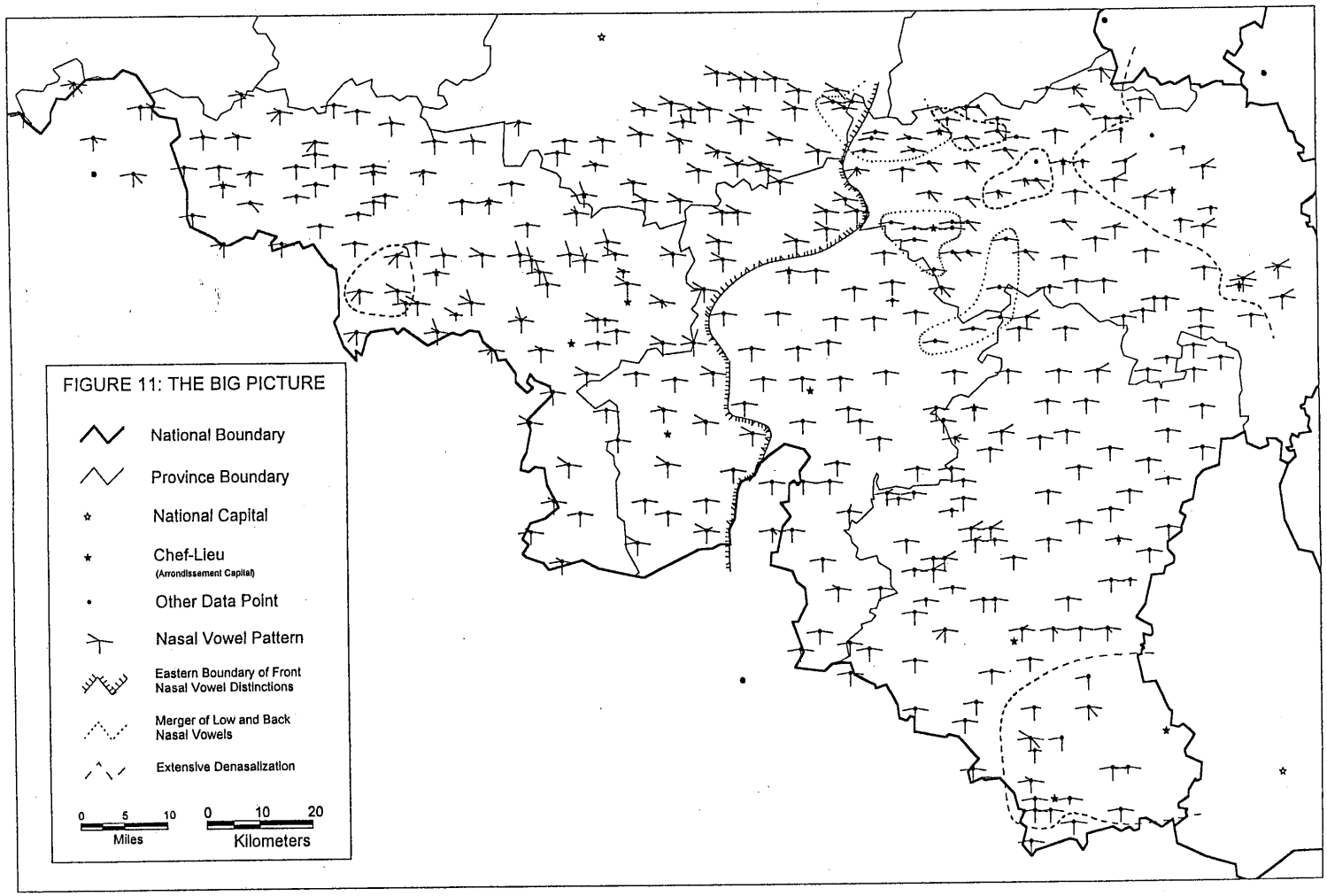


FIGURE 11: THE BIG PICTURE
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other Data Point
Nasal Vowel Pattern
Eastern Boundary of Front Nasal Vowel Distinctions
Merger of Low and Back Nasal Vowels
Extensive Denasalization
0 5 10
Miles
0 10 20
Kilometers

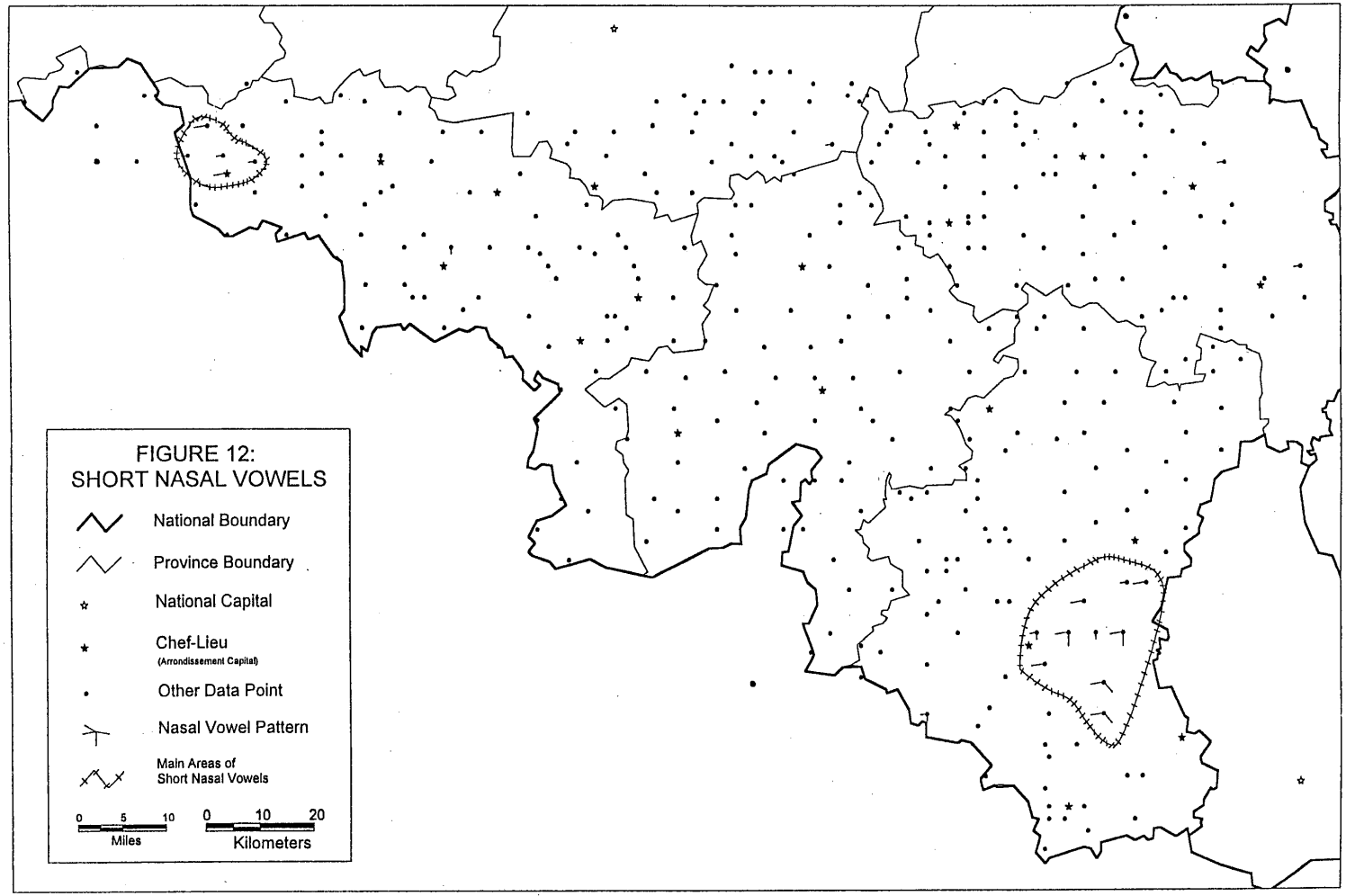


FIGURE 12:
SHORT NASAL VOWELS
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other Data Point
Nasal Vowel Pattern
Main Areas of
Short Nasal Vowels
0 5 10
Miles
0 10 20
Kilometers

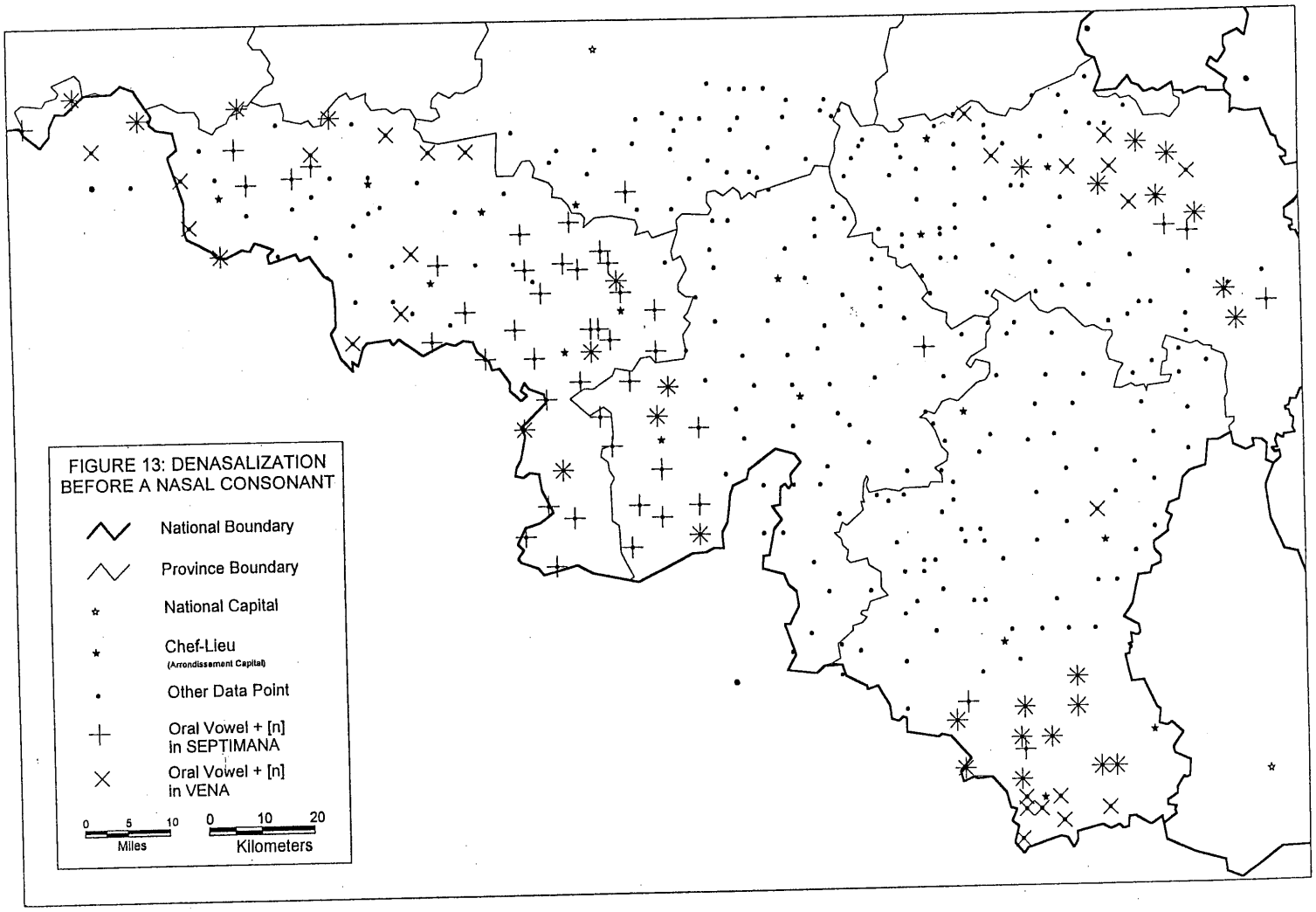


FIGURE 13: DENASALIZATION
BEFORE A NASAL CONSONANT
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other Data Point
Oral Vowel + [n]
in SEPTIMANA
Oral Vowel + [n]
in VENA
0 5 10
Miles
0 10 20
Kilometers

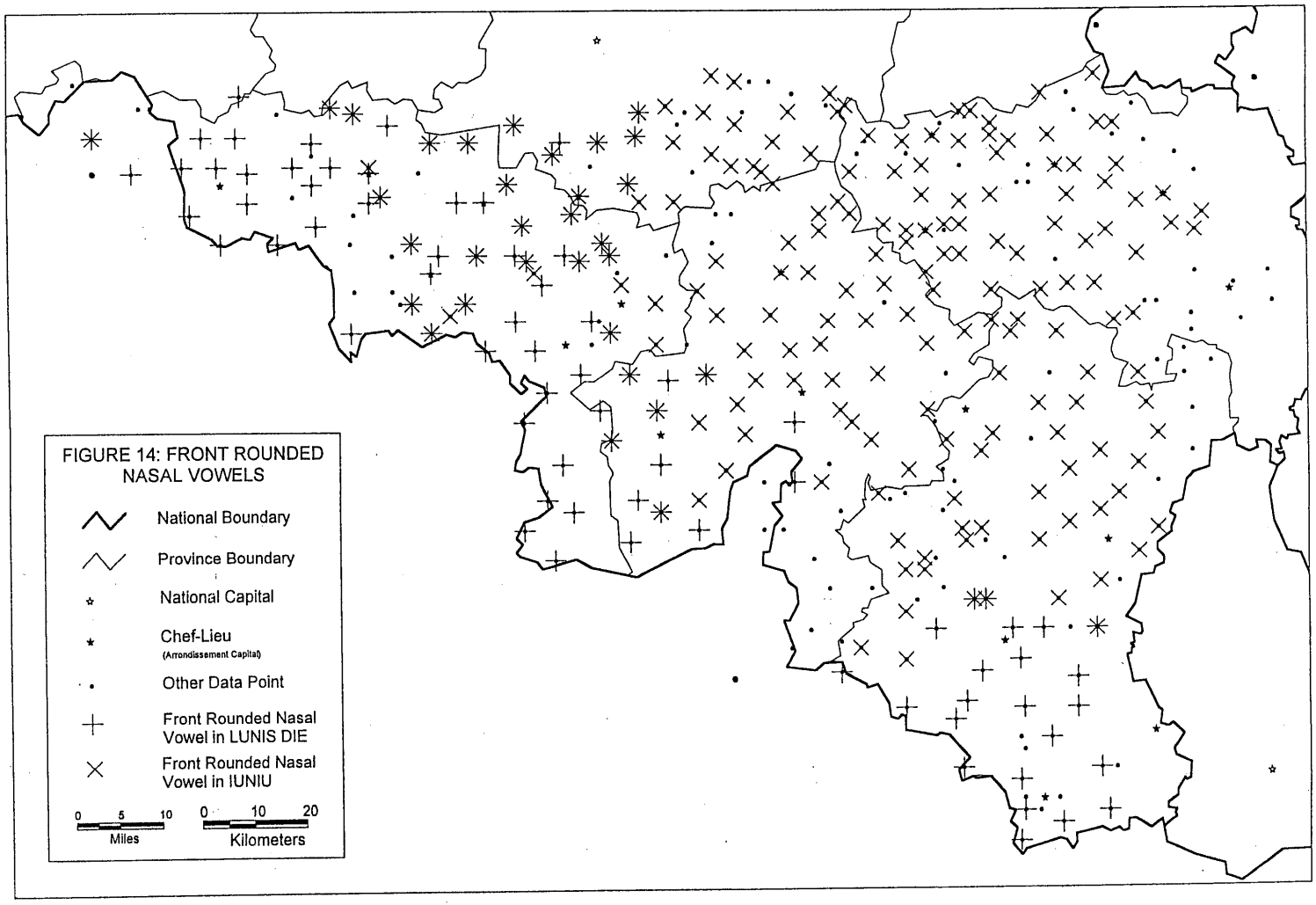
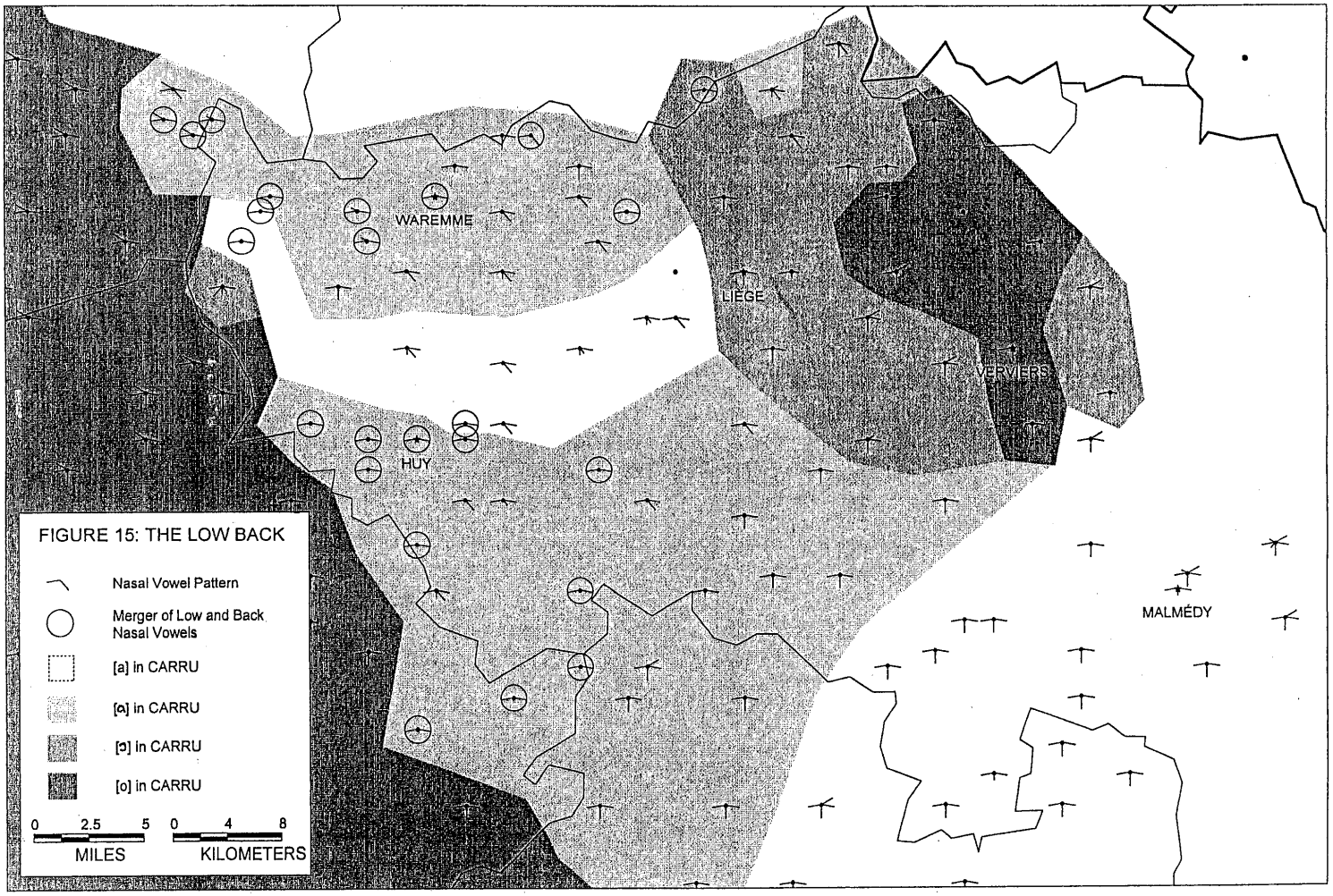


FIGURE 14: FRONT ROUNDED NASAL VOWELS
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other Data Point
Front Rounded Nasal Vowel in LUNIS DIE
Front Rounded Nasal Vowel in IUNIU
0 5 10
Miles
0 10 20
Kilometers


WAREMME
LIEGE
VERVIERS
HUY
MALMÉDY
FIGURE 15: THE LOW BACK
Nasal Vowel Pattern
Merger of Low and Back Nasal Vowels
[a] in CARRU
[ɑ] in CARRU
[ɔ] in CARRU
[o] in CARRU
0 2.5 5
MILES
0 4 8
KILOMETERS

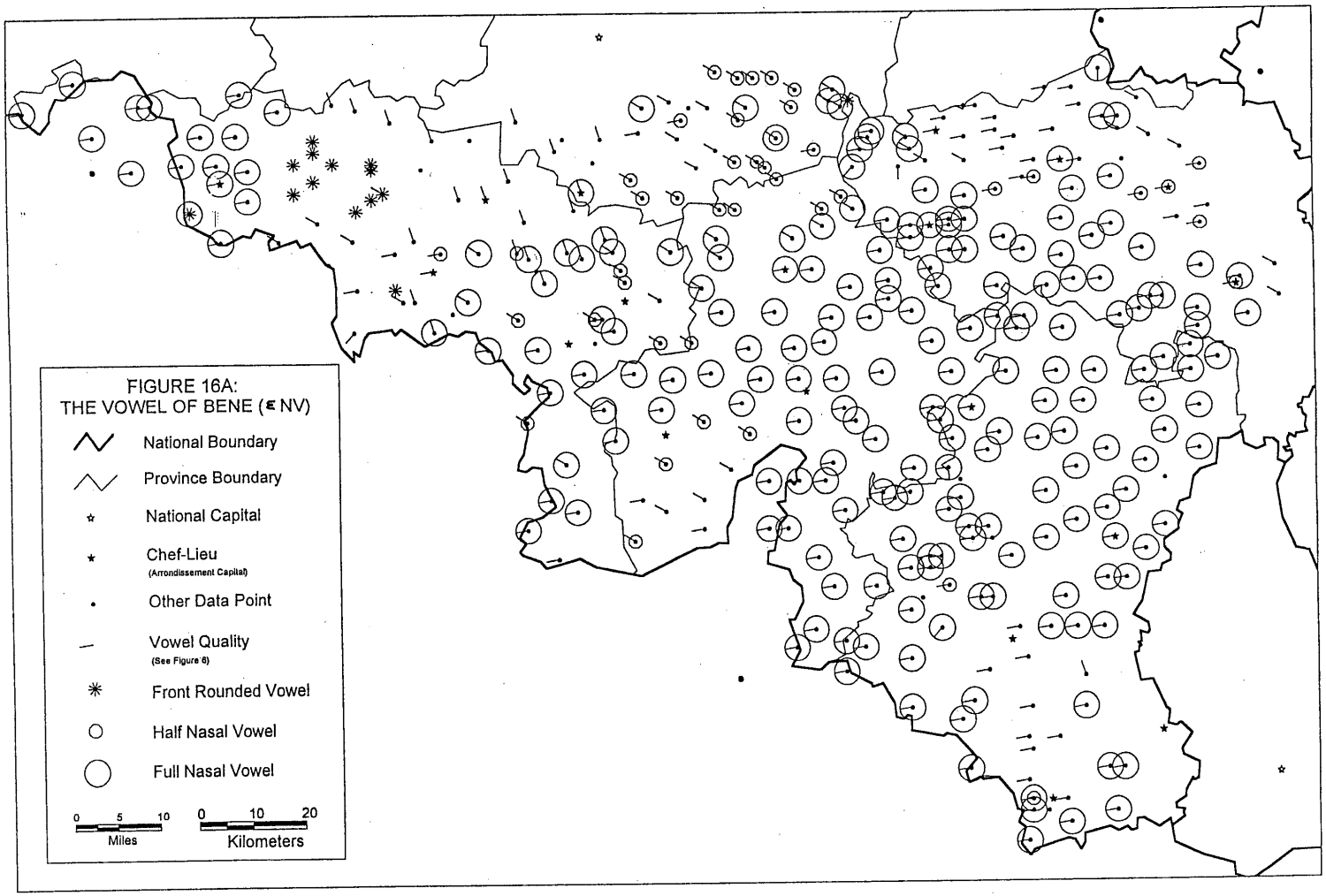


FIGURE 16A:
THE VOWEL OF BENE (ɛ NV)
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other Data Point
Vowel Quality
(See Figure 8)
Front Rounded Vowel
Half Nasal Vowel
Full Nasal Vowel
0 5 10
Miles
0 10 20
Kilometers

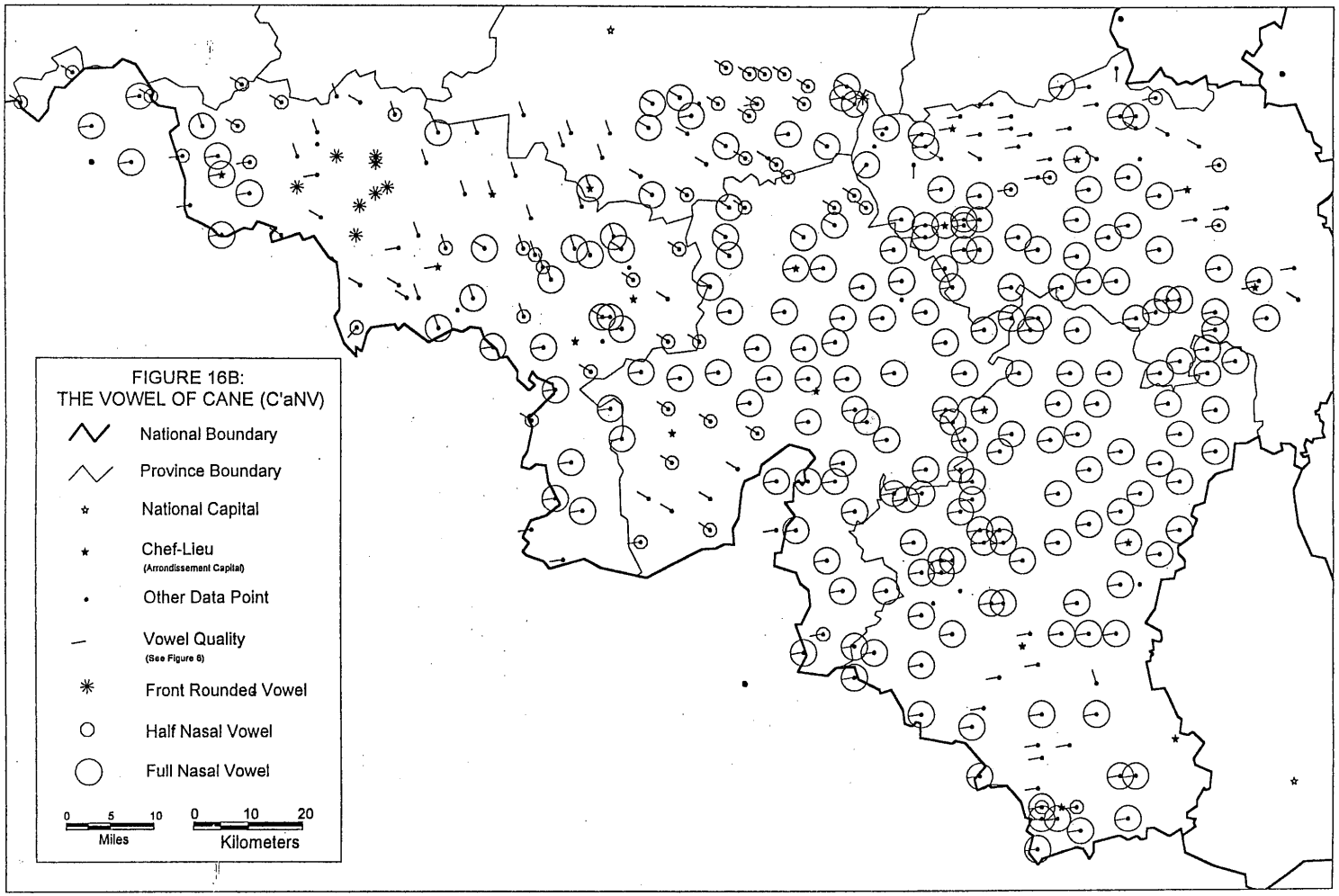


FIGURE 16B:
THE VOWEL OF CANE (C'aNV)
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other Data Point
Vowel Quality
(See Figure 6)
Front Rounded Vowel
Half Nasal Vowel
Full Nasal Vowel
0 5 10
Miles
0 10 20
Kilometers

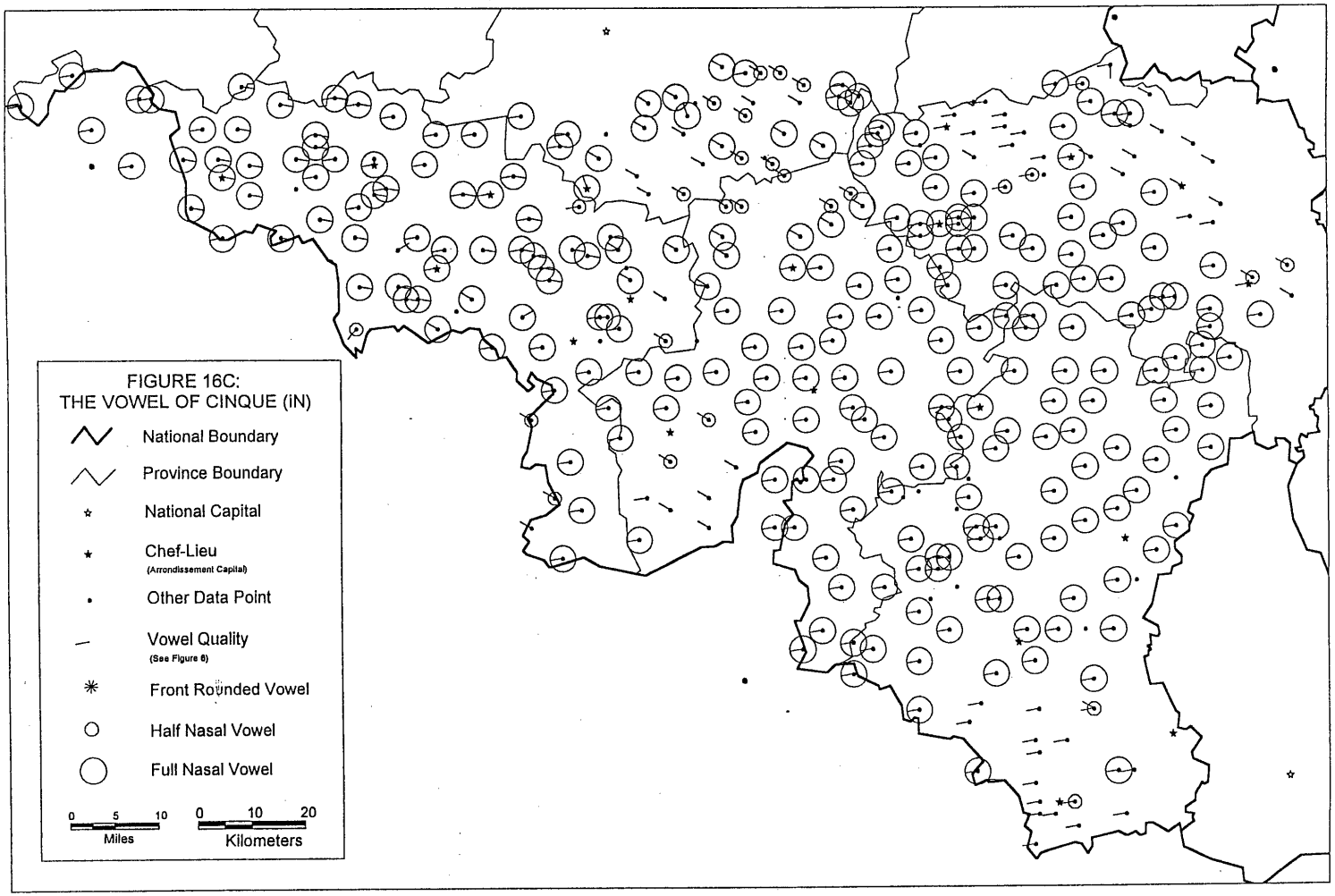


FIGURE 16C:
THE VOWEL OF CINQUE (iN)
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other Data Point
Vowel Quality
(See Figure 8)
Front Rounded Vowel
Half Nasal Vowel
Full Nasal Vowel
0 5 10
Miles
0 10 20
Kilometers

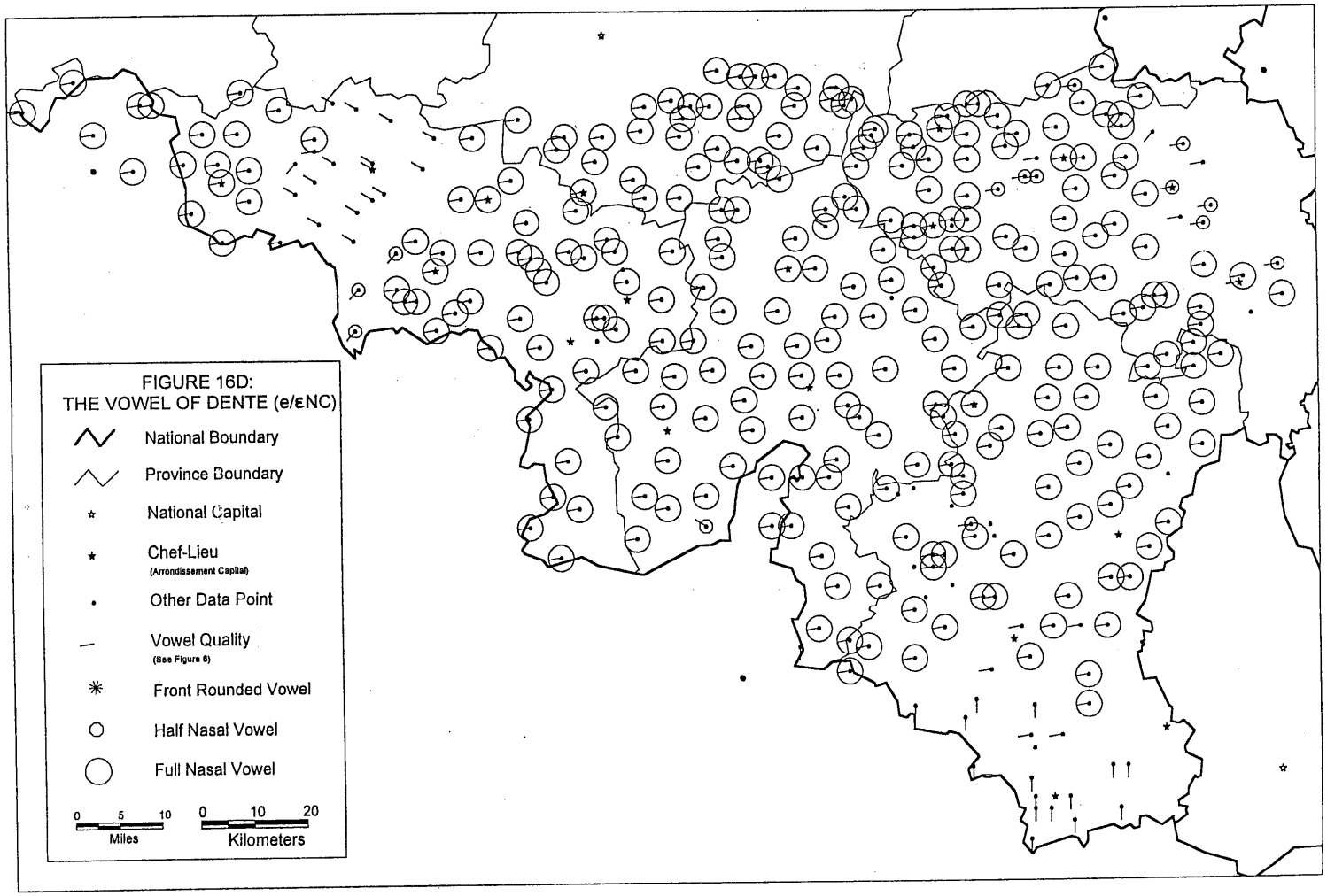


FIGURE 16D:
THE VOWEL OF DENTE (e/ɛNC)
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other Data Point
Vowel Quality
(See Figure 6)
Front Rounded Vowel
Half Nasal Vowel
Full Nasal Vowel
0 5 10
Miles
0 10 20
Kilometers

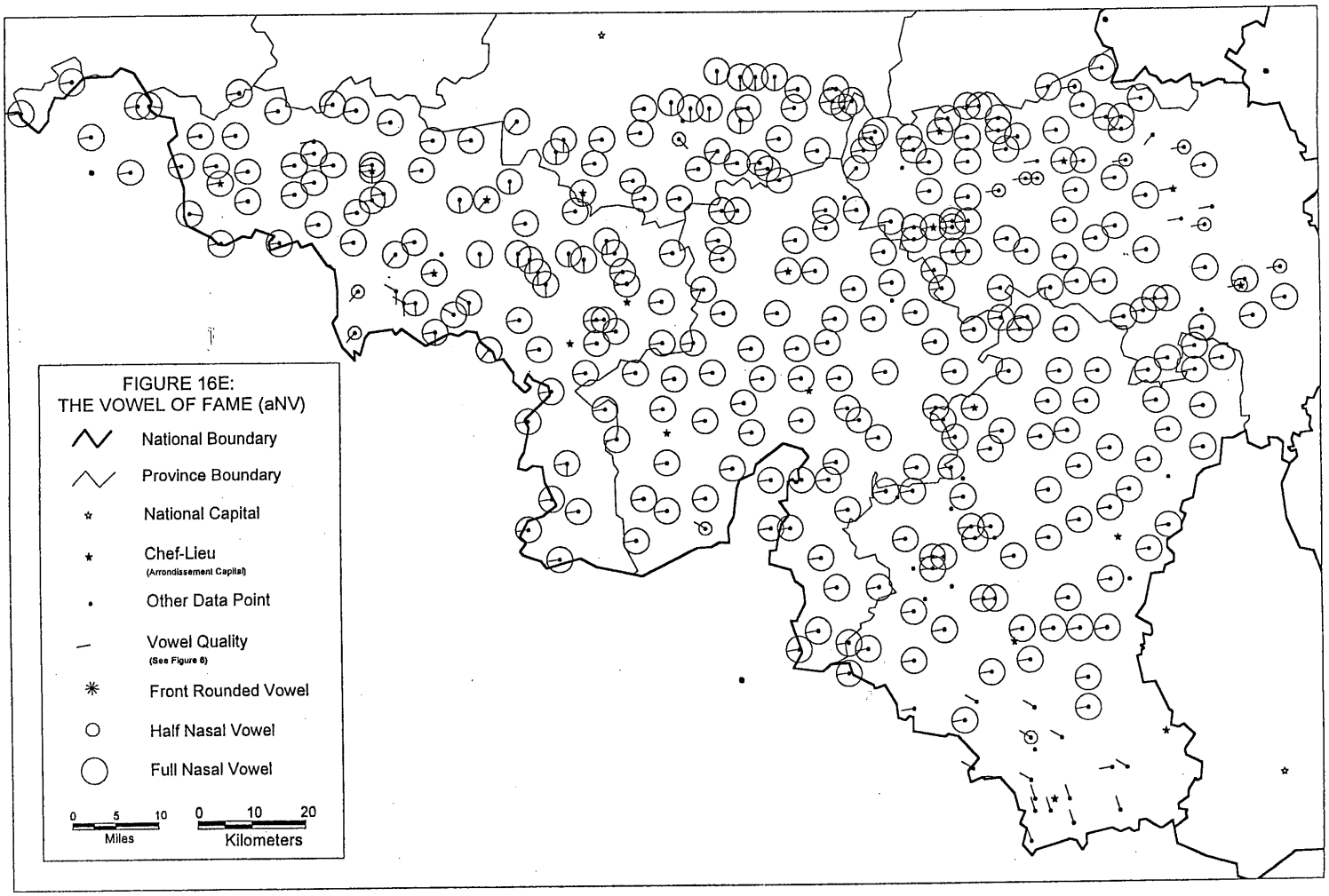


FIGURE 16E:
THE VOWEL OF FAME (aNV)
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other Data Point
Vowel Quality
(See Figure 6)
Front Rounded Vowel
Half Nasal Vowel
Full Nasal Vowel
0 5 10
Miles
0 10 20
Kilometers

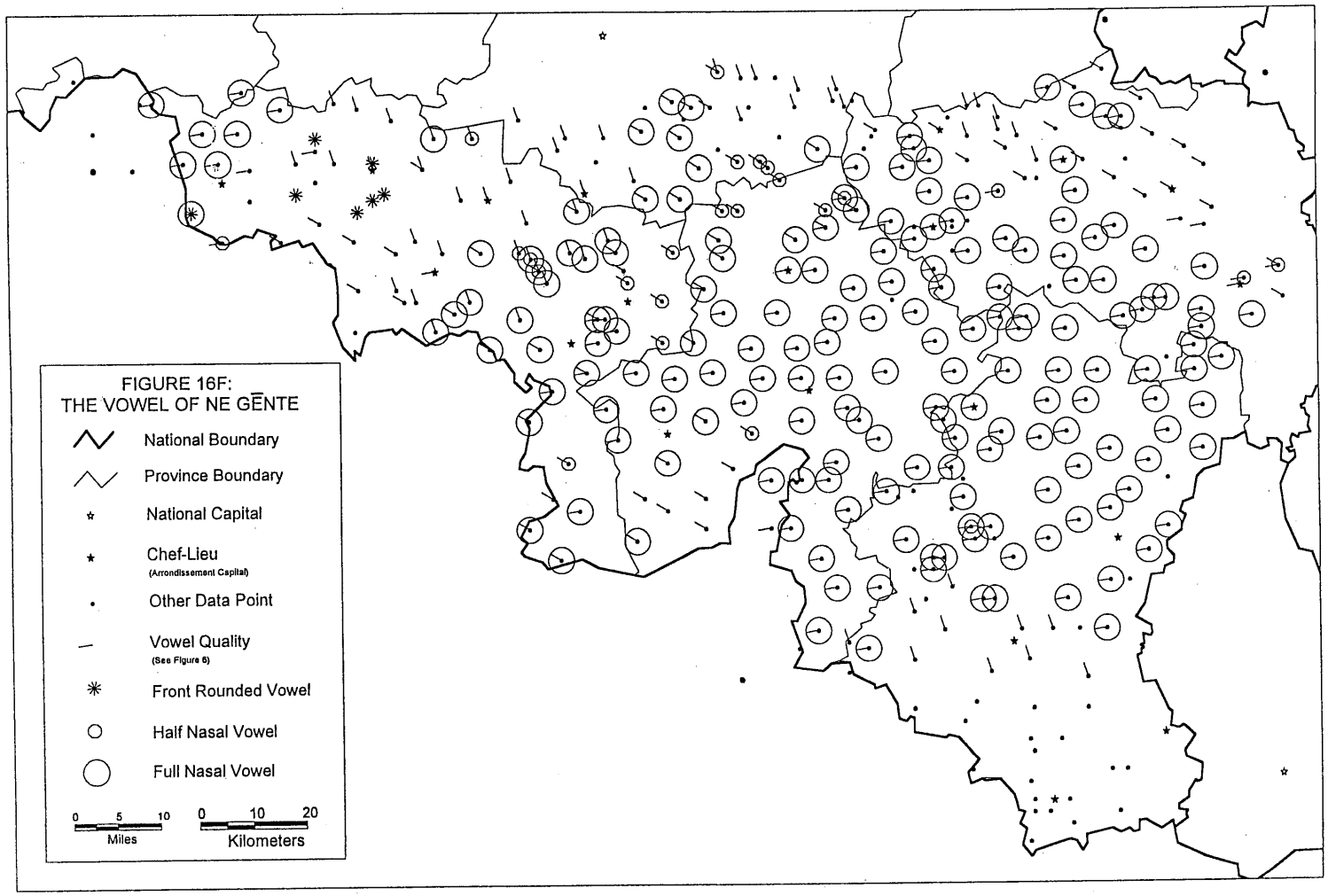


FIGURE 16F:
THE VOWEL OF NE GĒNTE
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other Data Point
Vowel Quality
(See Figure 6)
Front Rounded Vowel
Half Nasal Vowel
Full Nasal Vowel
0 5 10
Miles
0 10 20
Kilometers

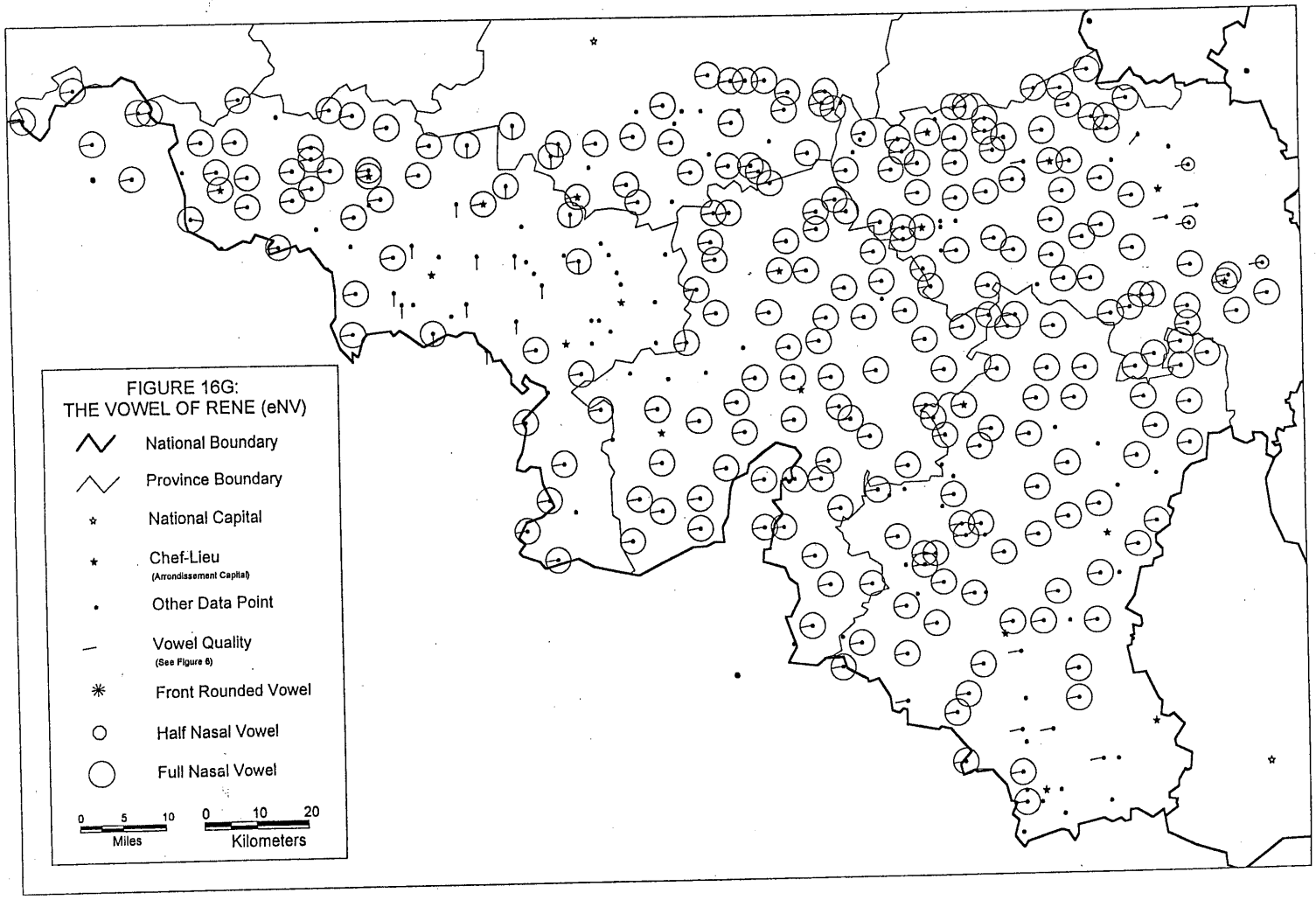


FIGURE 16G:
THE VOWEL OF RENE (eNV)
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other Data Point
Vowel Quality
(See Figure 6)
Front Rounded Vowel
Half Nasal Vowel
Full Nasal Vowel
0 5 10
Miles
0 10 20
Kilometers

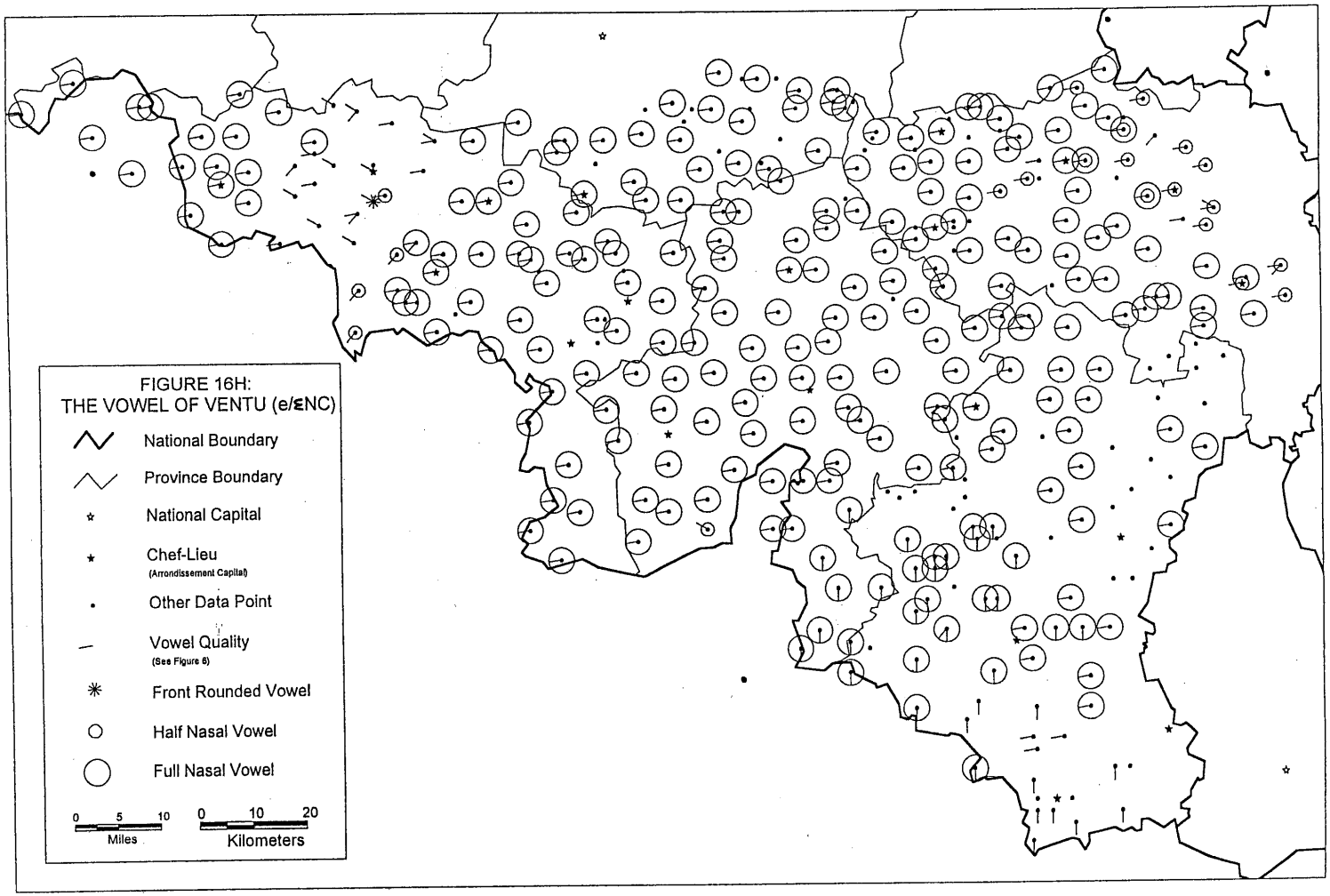


FIGURE 16H:
THE VOWEL OF VENTU (e/ɛNC)
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other Data Point
Vowel Quality
(See Figure 6)
Front Rounded Vowel
Half Nasal Vowel
Full Nasal Vowel
0 5 10
Miles
0 10 20
Kilometers

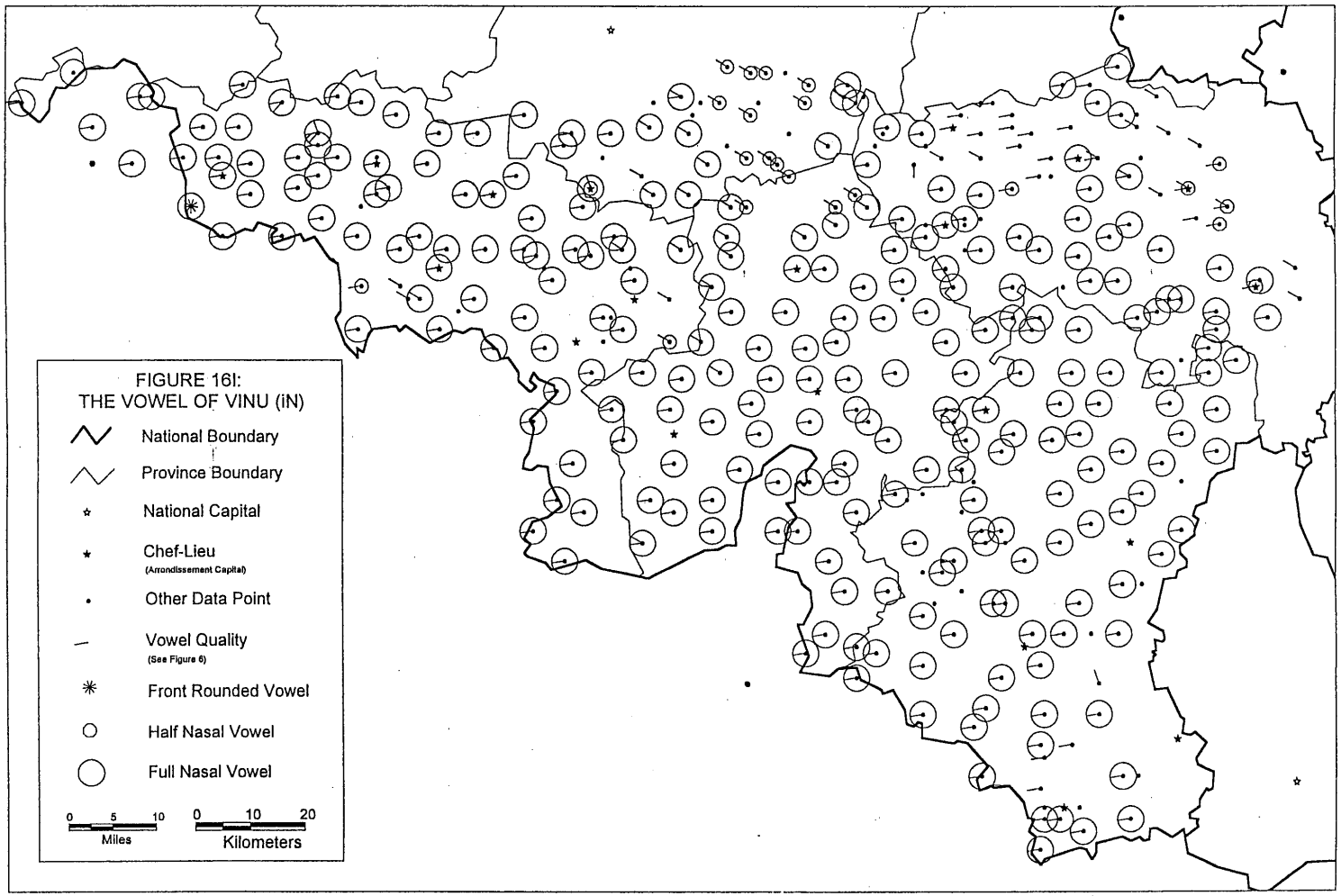


FIGURE 16I:
THE VOWEL OF VINU (iN)
National Boundary
Province Boundary
National Capital
Chef-Lieu
(Arrondissement Capital)
Other Data Point
Vowel Quality
(See Figure 6)
Front Rounded Vowel
Half Nasal Vowel
Full Nasal Vowel
0 5 10
Miles
0 10 20
Kilometers

PLACENAME	ARR.	COMM.	~BASE	ANNU	BA(L)NEU	BENE	BONU	CANE	CINQUE	DENTE	FAME	GAMBA	HOMO	IUNIU	LINEU	LUNIS DIE
TOURCOING (FRANCE)	No	1		6~	3~	3~	9~	3~	3~	3~	3~	6~	3~	3~<	3~	3~
WAMBRECHIES (FRANCE)	No	2		7~	3~o	3~o	3~o	3~o	3~	3~	3~o<	6~	3~	C~<	3~	C~
ASCQ (FRANCE)	No	3		6~	3~oy	3~	9~	3~>	3~	3~	3~o	6~	3~, C~	3~o<	3~, 3~o	C~
TOURNAI	To	1		6~	3~	3~	4o	4~*	9~>	3~	3~	6~	9~	3~<	3~	4~
PLOEGSTEERT	To	2		6~o	6~o	3~		2^	3~	3~	3~oy	6~	3~	uoy	3~	3~
COMINES-WARNETON	To	6		6~		3~	7~	2^	3~	3~	3~	6~	3~, C~	3~<	3~	3~
MOUSCRON	To	7		6~	3~o	3~	9~	2^	3~	3~	9~ay	6~	3~	3~<	3~	3~
ESCANAFFLES	To	13		6~	3~	3~	9~	2^	9~	3~	3~	6~	3~	3~<	3~	C~
WATTRIPONT	To	24		6~		3~	9~	2^	9~	3~	3~o	6~	3~, 9~	3~<	3~	3~
PECQ	To	27			3~	4~*		1~	3~*	3~	3~	6~	3~, 4~	3~<	3~	C~
MOLENBAIX	To	28		6~	3~o	3~	9~	2^	9~	3~	3~o	6~	3~	3~<	3~	C~
TEMPLEUVE	To	37		6~		3~		3^>	9~	3~	3~<	6~	3~	3~<	3~	C~
KAIN	To	39		6~	3~	3~		4~*	9~>	3~	3~	6~	3~	3~<	3~	C~
MONTROEUL-AU-BOIS	To	43		6~	3~	D	9~	1e	9~	5	3~	6~	9~	3~<	3~	C~
BECLERS	To	48		6~	3~	4~*	9~	4^>	9~	3~	3~	6~	3~, 9~	3~<	3~, 5^	C~
LEUZE-EN-HAINAUT	To	58		6~	3~	D>		3>	3~	2	3~	6~	9~	3~<	3~	C~
PIPAIX	To	71	*		3~	B>		B>		2	3~y	6~	3~	3~<	3~	
RUMES	To	73		6~	C~	C~	3~o	4o	9~	3~o	9~	6~m	3~, C~, 9	uo	3~o	C~
ANTOING	To	78		7~	3~	3~		3~>	9~	3~	3~	7~	3~	9~<		C~
RONGY	To	94			3~	3~o		3~o	3~	3~	3~	6~m	C~	3~<	5~	C~
WIERS	To	99		6~		2>		2>	9~	4	3~	6~	3~	3~<		C~
ATH	A	1		6~	3~	D>		C	3~	2	3~, 6y	6~	9~	3~<	3~	C~
ELLEZELLES	A	2		6~	3~	1e	9~	1	9~, 3~	2	3~	6~	9~	C~	3~	C~
WODECQ	A	7		6~	3~	1	9~	2>	9~, 3~	2	3~	6~	9~	C~	3~, D~	C~
FRASNES-LEZ-BUISSENAL	A	12		6~	3~, 3~y	C	9~	1o	9~	3~, 3	4y	6~	9~	4n<	3~	C~
MOUSTIER-FRASNES-LEZ-ANVAING	A	18	*		3~g	C			9~	4	3~y	6~			3~	
BOUVIGNIES	A	20	*		3~	D>		B>		2	3~	6~		C~	3~	
HOUTAING	A	28		6~	3~	D>	9~	D>	3~	2	3~	6~	9~	3~<	3~	C~
GONDREGNIES	A	37		6~	3~		9~	1	3~	2	3~	6~	9~	3~<	3~	B
CHIEVRES	A	44		6~	3~	B, D>	9~	B>	9~, 3~	2	3~	6~	9~	C~, 3~<		C~
LADEUZE	A	50		6~	3~	B>	9~	B	9~	2	3~<	6~	9~	3~<		C~
BELOEIL	A	52	*		3~	C>		B	3~	2	3~	6~			3~	D
RAMEGNIES	A	55		6~	3~	2>	9~	2>	9~	2	3~	6~	9~	3~g<		C~
STAMBRUGES	A	60		6~	3~	2>		B	9~	2	3~	6~	9~	3~<		D
MONS (HAINAUT)	Mo	1		6~	3~	4	9~	4>	3~	3~	3~	6~	9~	3~<	3~	C~
NEUFVILLES	Mo	9		6~	3~	1		1	9~, 3~	3~	6~y	6~	9~	3~<		C~
ERBISOEUL	Mo	17		6~		1	9~	1	3~	3~	3~	6~	9~	C~		C~
BAUDOUR	Mo	20		6~	3~	4>	9~	4	0	5^	5~	6~	0^, 9~	4y<		B
MAISIERES	Mo	23		6~		3^		1^	3~	3~		6~	9~	3~<	3~	C~
THULIN	Mo	37		6~g		4>		2	9~	5^	5^y	6~	0, 9~	5^<		C
WASMES	Mo	41		6~	2y	D>		2, 2o	9~	3~	2y, 6y	6~	9~	1y<	2^, 2	4<
PATURAGES	Mo	42		6~	2y	2>		2o, 2	9~	3~	2y, 6y	6~	9~	2y<	2	B
FRAMERIES	Mo	44		6~g	2~	1		1	9~	3~	6~, 3~	6~	9~	B~	2^	C~, 2<
HARVENG	Mo	57	*							3~	2~	6~		C~		
HARMIGNIES	Mo	58		6~		2~	9~	1~	2~	3~	2~, 6~y	6~	9~	C~	2~	B~
ONNEZIES	Mo	64		6~	3~	5	9~	5^	5^	5^	5^	6~	9^, 9~	5^<		C~
QUEVY-LE-GRAND	Mo	79		6~	3~	1~	9~	1~	2~	3~	3~, 6~y	6~	9~	C~		C~
SOIGNIES	S	1		6~	3~y	1	9~	1	3~	3~	5~y	6~	9~	3~<		C~
LESSINES	S	6		6~g	4g	1g	9~	1^g	3~	2	3~	6~	9~	3~<	3~	C~
BASSILLY	S	10		6~	3~	1g		1~	3~	2	3~	6~	9~	C~		C~

PLACENAME	ARR.	COMM.	~BASE	MANSIONE	NE GENTE	PISC+ONE	POENA	RENE	RUM(I)CE	SEPTIMANA	SIMIU	SINGULARE	UMBRA	UNU	VENA
TOURCOING (FRANCE)	No	1		9~		9~	4n	3~		4n	3~	6~	9~	3~	4n
WAMBRECHIES (FRANCE)	No	2		6~o		9~o	4on	3~o	9~	4^n	3~o	6~	9~	C~	4on
ASCQ (FRANCE)	No	3		7~		7~	C~n	3~y	7~	4^n<	3~o		9~	C~	3~n
TOURNAI	To	1		4o		4o	4~n	3~	4o	3~n*	3~	3~	4o	C~	4~n
PLOEGSTEERT	To	2		7~		7~	4^n	3~o	C~o	4n	C~		7~	C~>	4^n
COMINES-WARNETON	To	6		6~o		9~	4n	3~o	7~	4n	3~		9~	C~	4n
MOUSCRON	To	7		9~	3~	9~a	3^n	3~	9~	4^n	3~o		9~	3~	4^n
ESCANAFFLES	To	13		7~	3~	9~	4n	3~	3~	4n	3~	6~	9~	C~	4n
WATTRIPONT	To	24		9~	3~	9~	3~n		5^	4^n	3~	6~	9~	C~o	3~n
PECQ	To	27		9~>	3~, 4~*	9~>	4~n	3~	9~	3~n	3~	6~	9~	C~	4~n
MOLENBAIX	To	28		9~	3~	9~	3~n	3~o	9~	4n	3~		9~	C~	3~n
TEMPLEUVE	To	37		9~	3~	9~	5n		9~	4^n	3~		9~	4~	5n
KAIN	To	39		9~>	3~	4o	4~n	3~	3o	3~n	3~	3~	4o	C~	4~n
MONTROEUL-AU-BOIS	To	43		9~	!	9~	5^n	3~o	3~	5n	3~		9~	C~	5^n
BECLERS	To	48		9~	4	9~	3~n	3~	3~<	5n	3~	6~	9~	C~	3~n
LEUZE-EN-HAINAUT	To	58		9~		9~	3~n	3~y	3~<	3~n	3~		9~	C~	3~n
PIPAIX	To	71	*	9~	B>	9~o		3~	3~<	3~n	3~	3	9~	C~y	
RUMES	To	73		3~o	C~	3~o	Dn	9~	4o	9~n	C~	3~	3~o	C~	Dn
ANTOING	To	78		3~o		9~>	3~n	3~	3~<	3~n	3~	7~	9~>	C~	3~n
RONGY	To	94		3~o	3, 2^	6~o	4n		3~a	4n	3~	6~	3~o	C~	4n
WIERS	To	99		9~	2>	9~	3~n	3~	3~<	3~n	3~		9~	C~	3~n
ATH	A	1		9~	!>	9~	3~n	3~	9~	4^n	3~	2	9~	C~	3~n
ELLEZELLES	A	2		9~	1, 1e	9~		3~	3~	4n	3~	3~	9~	C~	4n
WODECQ	A	7		9~	1	9~	3~n	3~	3~	3~n	3~	2	9~	C~	3~n
FRASNES-LEZ-BUISSENAL	A	12		9~	C	8g	5n	3~g	3~	5^n	3~	5, 6~	9~	C~	5n
MOUSTIER-FRASNES-LEZ-ANVAING	A	18	*	9~	3	9~		3~	3~	4n		6~	9~	C~	
BOUVIGNIES	A	20	*	9~	C>	9~		3~	3~	3~n		2	9~	C~	
HOUTAING	A	28		9~	!	9~	3~n	3~	3~	3~n	3~	2	9~	C~	3~n
GONDREGNIES	A	37		9~	2, 1	9~	3~yn	3~	9~	5^yn	3~	3~, 2	9~	C~g	3~yn
CHIEVRES	A	44		9~	B>, D>	6~g		3~	9~	3~n	3~	2	9~	C~	3~n
LADEUZE	A	50		9~	B>	9~	3~n		9~, 3~<	3~n	3~	2	9~	C~	3~n
BELOEIL	A	52	*	9~	D>	9~	3~n	3~	3~<	3~n		3~	9~	C~	3~n
RAMEGNIES	A	55		9~	2>	9~	3~n		3~<	3~n	3~	2	9~	C~	3~n
STAMBRUGES	A	60		9~	2>	9~	3~n		3~<	4~n*	3~		9~	C~	3~n
MONS (HAINAUT)	Mo	1		9~	3>, 4>	9~	3~n		9~	3~n	3~	6~	9~	C~	3~n
NEUFVILLES	Mo	9		9~	1	9~	3~n	6y	9~	3~n	3~		9~	C~>	3~n
ERBISOEUL	Mo	17		9~	1	9~	3~n	6y	9~	3~n	3~	2	9~	C~>	4n
BAUDOUR	Mo	20		9~	2>	9~		3~	2<	5^n	3~	3~	0, 9~	C~y	
MAISIERES	Mo	23		9~	1	9~			9~	4n	3~	3~	9~	C~>	
THULIN	Mo	37		9~	2>	9~	5^n	3~	3~<	5^n	3~		9~	Dg	5^n
WASMES	Mo	41		9~	!>	9~	3~n	6y	2<	3~n	2~	3~	9~	By	3~n
PATURAGES	Mo	42		9~	2>	9~	3~n	6y	3~<	4^n	2^	3~	9~	By	4n
FRAMERIES	Mo	44		9~	1	9^g	3~n, 4n		9~	3~n	2~	3~	9~	C~>	3~n
HARVENG	Mo	57	*		2~	9~								C~>	
HARMIGNIES	Mo	58		9~	1~	9~	4n	6y	9~	4n			9~	C~>	3~n
ONNEZIES	Mo	64		9~		9^	5^n	3~	5^	5^n		3~	9~	C~	5n
QUEVY-LE-GRAND	Mo	79		9~	1~, 1	9~	4^n	6~y	9~	4n		6~	9~	C~>	4^n
SOIGNIES	S	1		9~	1	9~	4^n	3~	9~	3~n	3~	3~	9~	C~>	4^n
LESSINES	S	6		9~	1	9~	5n	3~	9~	3~n	3~	6~	9~	Bg	5n
BASSILLY	S	10		9~	1~	9~	4n	3~	9~	3~n	3~	2	9~	C~	4n

PLACENAME	ARR.	COMM.	~BASE	VENTU	VINU	LONGITUDE	LATITUDE	POPULATION	URBAN	AGRICULTUR	PASTURAGE	INDUSTRY	FORESTRY	TOURISM
TOURCOING (FRANCE)	No	1		3~	3~o	3.17	50.73	76080	YES	NO	NO	YES	NO	NO
WAMBRECHIES (FRANCE)	No	2		3~	3~o	3.05	50.68	4984	NO	YES	NO	YES	NO	NO
ASCQ (FRANCE)	No	3		3~	3~o	3.15	50.62	3485	NO	YES	NO	YES	NO	NO
TOURNAI	To	1		4~*	3~	3.38	50.60	32221	YES	NO	NO	YES	NO	NO
PLOEGSTEERT	To	2		3~	3~	2.87	50.72	4836	NO	YES	NO	YES	NO	NO
COMINES-WARNETON	To	6		3~	5~y	3.00	50.77	8139	NO	YES	NO	YES	NO	NO
MOUSCRON	To	7		3~	3~	3.20	50.73	36354	NO	NO	NO	YES	NO	NO
ESCANAFFLES	To	13		3~	3~oy	3.43	50.75	1315	NO	YES	NO	NO	NO	NO
WATTRIPONT	To	24		3~	5~y, 3~	3.53	50.72	286	NO	YES	NO	NO	NO	NO
PECQ	To	27		4~*	3~	3.33	50.68	2034	NO	YES	NO	YES	NO	NO
MOLENBAIX	To	28		3~	3~	3.42	50.68	849	NO	YES	NO	NO	NO	NO
TEMPLEUVE	To	37		3~	3~	3.28	50.63	3471	NO	YES	NO	NO	NO	NO
KAIN	To	39		3~	3~	3.37	50.63	4620	NO	YES	NO	YES	NO	NO
MONTROEUL-AU-BOIS	To	43		5	3~	3.57	50.63	515	NO	YES	NO	NO	NO	NO
BECLERS	To	48		3~	3~	3.45	50.62	1039	NO	YES	NO	NO	NO	NO
LEUZE-EN-HAINAUT	To	58		4	3~o	3.62	50.60	6548	YES	NO	NO	YES	NO	NO
PIPAIX	To	71	*	2	3~o	3.57	50.58	1289	NO	YES	NO	NO	NO	NO
RUMES	To	73		3~	C~	3.30	50.55	1897	NO	YES	NO	YES	NO	NO
ANTOING	To	78		3~	3~	3.45	50.57	3477	NO	YES	NO	YES	NO	NO
RONGY	To	94		3~	3~	3.38	50.50	1222	NO	YES	NO	YES	NO	NO
WIERS	To	99		4, 4h	3~	3.53	50.50	2978	NO	YES	NO	YES	NO	NO
ATH	A	1		2	3~	3.77	50.62	10296	YES	NO	NO	YES	NO	NO
ELLEZELLES	A	2		2	3~	3.67	50.73	4444	NO	YES	NO	YES	NO	NO
WODECQ	A	7		5, 2	3~	3.73	50.72	1513	NO	YES	NO	NO	NO	NO
FRASNES-LEZ-BUISSENAL	A	12		3~	5~y, 3~,	3.62	50.67	2857	NO	YES	NO	NO	NO	NO
MOUSTIER-FRASNES-LEZ-ANVAING	A	18	*	4	3~y	3.62	50.65	899	NO	YES	NO	NO	NO	NO
BOUVIGNIES	A	20	*			3.77	50.63	565	NO	YES	NO	NO	NO	NO
HOUTAING	A	28		2	3~	3.67	50.63	556	NO	YES	NO	NO	NO	NO
GONDREGNIES	A	37		4	3~	3.90	50.62	155	NO	YES	NO	NO	NO	NO
CHIEVRES	A	44		3^	3~	3.80	50.58	2943	NO	YES	NO	NO	NO	NO
LADEUZE	A	50		2o, 2, B	3~	3.77	50.57	912	NO	YES	NO	YES	NO	NO
BELOEIL	A	52	*	5, 3		3.73	50.55	2291	NO	YES	NO	YES	NO	NO
RAMEGNIES	A	55		2	3~	3.63	50.53	225	NO	YES	NO	NO	NO	NO
STAMBRUGES	A	60		2	3~	3.72	50.50	1478	NO	YES	NO	NO	YES	NO
MONS (HAINAUT)	Mo	1		3~	3~	3.93	50.45	25661	YES	NO	NO	YES	NO	NO
NEUFVILLES	Mo	9		3~	3~	4.00	50.57	2431	NO	YES	NO	YES	NO	NO
ERBISOEUL	Mo	17		3~, 5	3~	3.88	50.50	1001	NO	YES	NO	NO	NO	NO
BAUDOUR	Mo	20		5^	3~	3.83	50.48	4745	NO	YES	NO	YES	YES	NO
MAISIERES	Mo	23		3~	3~	3.95	50.48	1659	NO	YES	NO	YES	NO	NO
THULIN	Mo	37		5^	4^y	3.73	50.42	2537	NO	YES	NO	YES	NO	NO
WASMES	Mo	41		3~	2y	3.83	50.42	15192	NO	NO	NO	YES	NO	NO
PATURAGES	Mo	42		3~	2y	3.85	50.40	10296	NO	NO	NO	YES	NO	NO
FRAMERIES	Mo	44		3~	2~	3.88	50.40	12049	NO	NO	NO	YES	NO	NO
HARVENG	Mo	57	*			3.98	50.38	654	NO	YES	NO	NO	NO	NO
HARMIGNIES	Mo	58		3~	3~	4.02	50.40	1036	NO	YES	NO	YES	NO	NO
ONNEZIES	Mo	64		5^	3~	3.72	50.35	287	NO	YES	NO	NO	NO	NO
QUEVY-LE-GRAND	Mo	79		3~	3~	3.93	50.35	733	NO	YES	NO	NO	NO	NO
SOIGNIES	S	1		3~	3~	4.07	50.57	10345	YES	NO	NO	YES	NO	NO
LESSINES	S	6		4	3~	3.82	50.70	9931	YES	NO	NO	YES	NO	NO
RACCILLY	S	10		4, 2	3~	3.93	50.67	1107	NO	YES	NO	NO	NO	NO

PLACENAME	ARR.	COMM.	~BASE	ANNU	BA(L)NEU	BENE	BONU	CANE	CINQUE	DENTE	FAME	GAMBA	HOMO	IUNIU	LINEU	LUNIS DIE
HOVES	S	13		6~	3~		9~	1	3~	3~	3~	6~	9~	C~	3~	C~
BRAINE-LE-COMTE	S	19		6~	3~y	1		1	9~, 3~	3~	6~y	6~	9~	C~y		C~
MARCHE-LEZ-ECAUSSINNES	S	29		6~		1	9~	1	9~, 3~	3~	3~	6~	9~	C~		C~
GOTTIGNIES	S	31		6~		2~	9~	2~	9~	3~	6~y	6~	9~	C~		C~
HOUDENG-GOEGNIES	S	36		6~		1^	9~	1^	9~, 3~	3~	6~y	6~	9~	3~<		C~
LA LOUVIERE	S	37		6~	3~	1~, 1	9~	1^	9~	3~	6~y	6~	9~	C~		C~
PETIT-ROEULX-LEZ-NIVELLES	Ch	4		6~	3~	1	9~	lg	3^	3~	3~	6~	8, 9~	C~		C~
GODARVILLE	Ch	16		6~		1~		1~	9~	3~	6~y	6~	9~	3~<		C~
LUTTRE	Ch	19	*													
TRAZEGNIES	Ch	27		6~	3~	1~y	u~	1~g	9~	3~	6~y	6~	8	C~		C~
VIESVILLE	Ch	28		6~	3~	2~		2~	2~	3~	3~<	9~	8	C~		C~
FLEURUS	Ch	33		6~	3~	2~		2^	2~	3~	3~<	6~	9~	3~<	2~	3~
GOSSELIES	Ch	36	*			2^					3~<	6~	8			
JUMET	Ch	43		6~	3~	2^		2^	2~	3~	3~<	6~	9~	C~		3~
CHATELET	Ch	61		6~	3~	2		2	2	3~	3~<	7~	9~	C~	2~	3~
LANDELIES	Ch	63		6~		2^		2~	3~	3~	3~	6~	9~	3~<		C~
MONTIGNY-LE-TILLEUL	Ch	64	*		3~	3~		3~	3~	3~	3~<	6~				
GERPINNES	Ch	72		6~	3~	2^	9~	2^	2^	3~	3~<	6~	9~	C~	2^	3~
HAINE-SAINT-PIERRE	Th	2	*				9~	1^	9~	3~	6~y	6~		C~		
LEVAL-TRAHEGNIES	Th	5		6~	3~	1~	9~	1~	9~	3~	6~y	6~	9~	3~<		C~
VELLEREILLE-LES-BRAYEUX	Th	14		6~	6~e	2^	9~	1^	0~	3~	3~	6~	9~	3~<		C~
JAMIOULX	Th	24		6~		3~		3~	3~	3~	3~<	6~	9~	C~		3~, C~
GRAND-RENG	Th	25		6~	6~e	3~		3~	3~	3~	5~	6~	9~	3~<	3~	C~
FONTAINE-VALMONT	Th	29		6~	3~o	3~	9~	3~	3~	3~	3~	6~	9~	3~<		C~
GOZEE	Th	32	*								3~<	6~				
THIRIMONT	Th	43		6~	3~	3~	9~	3~y	3~	3~	3~	6~	9~	3~<		C~
THUILLIES	Th	46		6~	3~	3~g	9~	2^	3~	3~	3~	6~	9~	3~<	3~	C~
BOUSSU-LEZ-WALCOURT	Th	53		6~	3~	3~		3~	3~	3~	3~	6~	9~	3~<	3~	C~
GRANDRIEU	Th	54		6~	3~	2^	9~	2^	2^	3~	3~	6~	9~	3~<		C~
RANCE	Th	62		6~		2~		3~	3~	3~	3~, 6y	6~	9~	3~<		C~
BAILIEVRE	Th	64		6~	3~o	3~g		3~y	2^	3~	3~	6~	9~	3~<		C~
CHIMAY	Th	72		6~	3~	3~	9~	3~	3~	3~	3~	6~	9~	3~<	3~	C~
MOMIGNIES	Th	73		6~	3~	3~y		3y	2	3~	3~	6~	9~	3~<	3~	C~
FORGE-PHILIPPE	Th	82		6~	3~	3	9~	4	3~	3~	3~	6~	9~	3~<		C~
NIVELLES	Ni	1		6~	3~	1~		1~, 1g	1~	3~	6~y	6~	9~	C~	3~	C~
NETHEN	Ni	2		6~		2^		2^	2~	3~	6~y	6~		C~	2^	9~
TOURINNES-LA-GROSSE	Ni	5	*			2^		2^	3~	3~	6~y	6~		C~		9~
BEAUVECHAIN	Ni	6		6~	3~	2^g		2^g	2^	3~	6~y	6~	9~	4~	2^	9~
L+A230'ECLUSE	Ni	9	*			2^g		2^g	2^	3~	6~y	6~		4~		
LA HULPE	Ni	10	*			2~g		2~g	2~	3~	3~	6~		C~		C~
ROSIERES	Ni	11		6~	3~	2g	9~	2~	2~	3~	6~y	6~	8, 9~	C~	3~	3~
PIETREBAIS	Ni	14	*			2, 2~g		2, 3^	2g	3~	3~<	6~				9~
ZETRUD-LUMAY	Ni	17		6~		2^	9~	2^	2^	3~	3~<	6~	9~	3~<		9~
OPHEYLISSEM	Ni	19		9~	3~	2~	9~	3~	3~	3~	3~<	9~	9~	3~<	3~	9~
NEERHEYLISSEM	Ni	20		9~, 7~o	6y, 3~	2~		2~	3~	3~	3~<	9~	9~	C~	3~	9~
BIERGES	Ni	24	*			3^g		3~>	1~n	3~		6~				9~
WAVRE	Ni	25	*							3~	6~y	6~				
DION-LE-VAL	Ni	26		6~	3~	2g	9~	2^	2^	3~	6~y	6~	9~	C~	2^	9~
JODOIGNE	Ni	28		6~		2^	9~	2^	2	3~	3~<	6~	9~	C~	2^	9~
						1	9~	1	3~	3~	5~y	6~	9~	C~		C~

PLACENAME	ARR.	COMM.	~BASE	MANSIONE	NE GENTE	PISC+ONE	POENA	RENE	RUM(I)CE	SEPTIMANA	SIMIU	SINGULARE	UMBRA	UNU	VENA
HOVES	S	13		9~	1^, 1	9~	4n	6~y	9~	3~n	3~	3~	9~	C~	4n
BRAINE-LE-COMTE	S	19		9~	1	9~	3~n	6~y	9~	3~n		3~	9~	C~y>	3~n
MARCHE-LEZ-ECAUSSINNES	S	29		9~	1	9~	3~n		9~	5n	3~	3~	9~	C~>	3~n
GOTTIGNIES	S	31		9~, 8	2~	9~	4^n	6y	9~	4~n*	3~	3~	9~		4~n
HOUDENG-GOEGNIES	S	36		8	1^, 1	9~	4^n	6y	9~	4~n*	3~	3~	9~		4~n
LA LOUVIERE	S	37		9~	1~, 1^	9~	4n		9~	5n	3~	3~	9~	C~>	3~n
PETIT-ROEULX-LEZ-NIVELLES	Ch	4		8	2~, 1~	9~	3~n	6~y	9~	4n	3~	3~	9~	C~>	3~n
GODARVILLE	Ch	16		8	1~	9~	4n		9~	4n	3~	3~	9~	C~>	4^n
LUTTRE	Ch	19	*						9~						
TRAZEGNIES	Ch	27		8	1~	9~	5n	3~, 6~y	9~	5n	3~	3~	9~	C~>	3~n
VIESVILLE	Ch	28		8	2~	9~	3~n		9~	5n	3~	3~	9~	C~>	3~n
FLEURUS	Ch	33		8n, 8	2^	9~	3~n<		9~	3~n<	2~	3~	9~	3~>	3~n<
GOSSELIES	Ch	36	*		2	9~	4n<			4n<				C~>	4n<
JUMET	Ch	43		8n, 8	2^	9~	4n<		9~	4n<	3~	3~	9~	C~>	3~n
CHATELET	Ch	61		8n, 8	2^, 2	9~	4n<		9~	4n<	2	3~	9~	3~>	4^n<
LANDELIES	Ch	63		9~	3~, 2~	9~	5n		9~	5n	3~	3~	9~	C~>	3~n<
MONTIGNY-LE-TILLEUL	Ch	64	*	8	3~	9~	5n		9~	4n<		3~		C~>	3~n<
GERPINNES	Ch	72		8	2^, 2	9~	4n<		9~	4n<	2^	3~	9~	3~>	3~n<
HAINE-SAINT-PIERRE	Th	2	*	8	2~, 1^	9~	4^n		9~	4~n*		3~		C~>	4~n
LEVAL-TRAHEGNIES	Th	5		9	1~	9~		6y	9~	4n	3~	3~	9~	C~>	
VELLEREILLE-LES-BRAYEUX	Th	14		9~	1~	9~	3~n	6y	9~	4n	3~	3~	9~	C~>	3~n
JAMIOULX	Th	24		8	3~	9~	4^n<		9~	5n<	3~	3~	9~	C~>	3~n<
GRAND-RENG	Th	25		9~	2~, 2	9~	4^n	6y	9~	4n	3~	3~	9~	C~>	3~n
FONTAINE-VALMONT	Th	29		9~	2~, 2	9~	3~n	3~	9~	4n	3~	3~	9~	C~>	3~n
GOZEE	Th	32	*		3~	9~	4n<		9~	4n<				C~>	4n<
THIRIMONT	Th	43		9~	3~	9~	3~n		9~	4n	3~	3~	9~	C~>	3~n
THUILLIES	Th	46		9~	3~, 2~	9~	3~n	3~	9~	4n	3~	3~	9~	C~n>	3~n
BOUSSU-LEZ-WALCOURT	Th	53		9~	3~	9~	4n<	3~	9~	4n<	3~	3~	9~	C~>	3~n<
GRANDRIEU	Th	54		9~	2~	9~	4n	3~	9~	4n	3~	3~	9~	C~>	4n
RANCE	Th	62		9~	2^	9~	5n	3~	9~	4n	3~	3~	9~	C~>	5n
BAILIEVRE	Th	64		9~	2	9~	3~n	3~	9~	4n	3~	3~	9~	C~>	3~n
CHIMAY	Th	72		9~	3~	9~	3~n		9~	5n	3~	3~	9~	C~>	3~n
MOMIGNIES	Th	73		9~	2~, 2	9~	4^n	3~	9~	4n	3~	3~	9~	C~>	4^n
FORGE-PHILIPPE	Th	82		9~	2~	9~	3~n	3~	9~	4n	3~	3~	9~	C~>	3~n
NIVELLES	Ni	1		8	1	9~	3~n	3~	9~	3~n	3~	3~	9~	C~>	3~n
NETHEN	Ni	2		8n	2^, 1	9~	3~n	3~	9~	3~n	2~	3~	9~	9~	3~n<
TOURINNES-LA-GROSSE	Ni	5	*	8n	1	9~	3~n	3~	9~	3~n	2~	3~		9~	3~n<
BEAUVECHAIN	Ni	6		8n	1	9~	3~n	3~	9~	3~n	2^	3~	9~	9~	3~n<
L+A230'ECLUSE	Ni	9	*			9~	3~n	3~	9~	3~n		3~			3~n<
LA HULPE	Ni	10	*			9~	3~n		9~	3~n					3~n
ROSIERES	Ni	11		8n	2~	9~	3~n	3~y	9~	3~n	3~	3~	9~	3~>	3~n
PIETREBAIS	Ni	14	*			9~	3~n		9~	3~n					3~n<
ZETRUD-LUMAY	Ni	17		8n	1	9~	3~n<	3~	9~	3~n	2^	3~	9~	9~	3~n<
OPHEYLISSEM	Ni	19		7n	1	9~	3~n<	3~		3~n	3~	3~	9~	9~	3~n<
NEERHEYLISSEM	Ni	20		7n	1	7^o	3~n<	3~	9~	3~n		3~	9~	9~	3~n<
BIERGES	Ni	24	*			9~	3~n		9~	3~n					3^n
WAVRE	Ni	25	*	8n	2~	9~			9~	3~n					3^n
DION-LE-VAL	Ni	26		8n	2	9~	3~n		9~	3~n	2^	3~	9~	9~	3~n<
JODOIGNE	Ni	28		8n	1	9~	3~n	3~	9~	3~n	2^	3~	9~	9~	3~n
SAINTES	Ni	33		9~	1	9~	3~n	6~y	9~	3~n	3~	3~	9~	C~>	3~n

PLACENAME	ARR.	COMM.	~BASE	VENTU	VINU	LONGITUDE	LATITUDE	POPULATION	URBAN	AGRICULTUR	PASTURAGE	INDUSTRY	FORESTRY	TOURISM
HOVES	S	13		3~	3~	4.03	50.67	622	NO	YES	NO	NO	NO	NO
BRAINE-LE-COMTE	S	19		3~	3~y	4.13	50.60	10040	YES	NO	NO	YES	NO	NO
MARCHE-LEZ-ECAUSSINNES	S	29		3~	3~	4.17	50.53	2075	NO	YES	NO	YES	NO	NO
GOTTIGNIES	S	31		3~	3~	4.05	50.48	662	NO	YES	NO	NO	NO	NO
HOUDENG-GOEGNIES	S	36		3~	3~	4.15	50.48	9214	NO	NO	NO	YES	NO	NO
LA LOUVIERE	S	37		3~	3~	4.18	50.47	21589	NO	NO	NO	YES	NO	NO
PETIT-ROEULX-LEZ-NIVELLES	Ch	4		3~	3~	4.30	50.55	224	NO	YES	NO	NO	NO	NO
GODARVILLE	Ch	16		3~	3~	4.28	50.48	1707	NO	YES	NO	YES	NO	NO
LUTTRE	Ch	19	*			4.38	50.50	0	NO	NO	NO	NO	NO	NO
TRAZEGNIES	Ch	27		3~	1~, 3~	4.32	50.47	6709	NO	NO	NO	YES	NO	NO
VIESVILLE	Ch	28		3~	2~	4.40	50.48	1881	NO	YES	NO	YES	NO	NO
FLEURUS	Ch	33		3~	2~	4.55	50.48	6881	NO	YES	NO	YES	NO	NO
GOSSELIES	Ch	36	*			4.42	50.45	10018	NO	YES	NO	YES	NO	NO
JUMET	Ch	43		3~	3~	4.43	50.43	28569	NO	NO	NO	YES	NO	NO
CHATELET	Ch	61		3~	2	4.52	50.40	14605	YES	NO	NO	YES	NO	NO
LANDELIES	Ch	63		3~	3~	4.35	50.37	1240	NO	YES	NO	YES	NO	NO
MONTIGNY-LE-TILLEUL	Ch	64	*			4.37	50.37	5656	NO	YES	NO	YES	NO	NO
GERPINNES	Ch	72		3~	2^	4.52	50.33	2072	NO	YES	NO	NO	NO	NO
HAINE-SAINT-PIERRE	Th	2	*			4.20	50.45	6490	NO	NO	NO	YES	NO	NO
LEVAL-TRAHEGNIES	Th	5		3~	3~	4.22	50.43	6128	NO	NO	NO	YES	NO	NO
VELLEREILLE-LES-BRAYEUX	Th	14		3~	3~	4.15	50.37	699	NO	YES	NO	NO	YES	NO
JAMIOULX	Th	24		3~	3~	4.40	50.35	1160	NO	YES	NO	YES	NO	NO
GRAND-RENG	Th	25		3~	3~	4.07	50.32	1763	NO	YES	NO	NO	NO	NO
FONTAINE-VALMONT	Th	29		3~	3~	4.20	50.32	912	NO	YES	NO	NO	NO	NO
GOZEE	Th	32	*			4.35	50.33	1747	NO	YES	NO	NO	NO	NO
THIRIMONT	Th	43		3~	3~	4.23	50.25	490	NO	YES	NO	NO	NO	NO
THUILLIES	Th	46		3~	3~	4.32	50.28	1807	NO	YES	NO	NO	NO	NO
BOUSSU-LEZ-WALCOURT	Th	53		3~	3~	4.37	50.22	765	NO	YES	YES	NO	NO	NO
GRANDRIEU	Th	54		3~	3~	4.17	50.20	649	NO	YES	YES	NO	NO	NO
RANCE	Th	62		3~	3~	4.27	50.13	1505	NO	YES	YES	NO	NO	NO
BAILIEVRE	Th	64		3~	3~	4.23	50.07	261	NO	YES	YES	NO	NO	NO
CHIMAY	Th	72		3~	3~	4.30	50.05	3279	YES	NO	NO	NO	NO	NO
MOMIGNIES	Th	73		3~	3~	4.17	50.02	2123	NO	NO	YES	NO	YES	NO
FORGE-PHILIPPE	Th	82		3~	3~	4.25	49.97	390	NO	NO	YES	NO	YES	NO
NIVELLES	Ni	1		3~	1^, 1~g	4.32	50.58	11929	YES	YES	NO	YES	NO	NO
NETHEN	Ni	2		3~	2^	4.67	50.78	1346	NO	YES	NO	NO	NO	NO
TOURINNES-LA-GROSSE	Ni	5	*		2^	4.73	50.77	912	NO	YES	NO	NO	NO	NO
BEAUVECHAIN	Ni	6		3~	2^g	4.77	50.77	1570	NO	YES	NO	NO	NO	NO
L+A230'ECLUSE	Ni	9	*			4.82	50.77	348	NO	YES	NO	NO	NO	NO
LA HULPE	Ni	10	*			4.48	50.72	4231	YES	YES	NO	YES	YES	NO
ROSIERES	Ni	11		3~	2~, 3~	4.55	50.73	869	NO	YES	NO	NO	NO	NO
PIETREBAIS	Ni	14	*			4.75	50.72	673	NO	YES	NO	NO	NO	NO
ZETRUD-LUMAY	Ni	17		3~	2^	4.88	50.75	719	NO	YES	NO	NO	NO	NO
OPHEYLISSEM	Ni	19		3~	2~	4.97	50.73	732	NO	YES	NO	NO	NO	NO
NEERHEYLISSEM	Ni	20		3~	2~	4.98	50.75	1966	NO	YES	NO	NO	NO	NO
BIERGES	Ni	24	*			4.58	50.70	1841	NO	YES	NO	YES	NO	NO
WAVRE	Ni	25	*			4.60	50.72	8170	YES	YES	NO	NO	NO	NO
DION-LE-VAL	Ni	26		3~	2^	4.65	50.72	344	NO	YES	NO	NO	NO	NO
JODOIGNE	Ni	28		3~	2^	4.87	50.72	4147	YES	YES	NO	NO	NO	NO
SAINTES	Ni	33		3~	3~	4.15	50.70	2780	NO	YES	NO	NO	NO	NO

PLACENAME	ARR.	COMM.	~BASE	ANNU	BA(L)NEU	BENE	BONU	CANE	CINQUE	DENTE	FAME	GAMBA	HOMO	IUNIU	LINEU	LUNIS DIE
BRAINE-LE-CHATEAU	Ni	36		6~	3~		9~	1	3~	3~	6~y	6~	9~	3~<		C~
BRAINE-L 'ALLEUD	Ni	38		6~		1	9~	1		3~	3~y	6~	8, 9~	C~		C~
OHAIN	Ni	39		6~	3~	3y	9~	2~	2~	3~	3~	6~	8, 9~	C~	3~	C~
LONGUEVILLE	Ni	45		6~	3~	2^		2^	2^	3~	6~y	6~	9~	C~	2^	9~
OTTIGNIES-LOUVAIN-LA-NEUVE	Ni	61		6~		2	9~	2	2	3~	7^y	6~	8	C~		3~
CORROY-LE-GRAND	Ni	62	*			2		2~	2~	3~	3~<, 5~y	6~	8	C~		9~
GLIMES	Ni	66	*			2~, 2^		3~	2~	3~	3~<	6~		C~		9~
ITTRE	Ni	72		6~	3~	1		1	3~	3~	6~y	6~	8	C~	3~	C~
LILLOIS-WITTERZEE	Ni	74	*					1	2~	3~	3~	6~		3~<		
TOURINNES-SAINT-LAMBERT	Ni	80		6~	3~	2^	9~	2^	2^	3~	3~<	6~	9~	C~	2^	9~
FOLX-LES-CAVES	Ni	85		6~		3^g	9~	2~g	2~	3~*	3~<	6~	9~	C~		9~
GENAPPE	Ni	90		6~	3~	2^		2	2	3~	3~	6~	8	C~	3~	C~
HEVILLERS	Ni	93		6~	3~	2	9~	2	2	3~	3~<	6~	9~	3~<		9~
THOREMBAIS-SAINT-TROND	Ni	97	*			2^		2		3~	3~<	6~		C~	2^	9~
PERWEZ (BRABANT)	Ni	98		6~		2^		2^	2^	3~	3~<	6~	9~	C~	2^	9~
MELLERY	Ni	107		6~	3~	2^	9~	2^	2^	3~	3~y<	6~	9~	C~		3~
SART-DAMES-AVELINES	Ni	112		6~	3~	2^	9~	2~	2	3~	3~<	6~	8, 9~	C~, 3~<		3~
NAMUR	Na	1		6~		3~		3~	3~	3~	3~<	6~	9~	C~	3~	9~
AISCHE-EN-REFAIL	Na	6		6~		2^		2^	2^	3~	3~<	6~	9~	C~	2^	9~
CORTIL-WODON	Na	19		6~	3~	2^		2^	2^	3~	3~<	6~	9~	C~	2^	9~
FORVILLE	Na	20	*		6y	2^	9~	2^	2^	3~		6~		C~	2^	9~
GEMBLOUX	Na	22		6~		2^		2~	2^	3~	3~<	6~	9~	3~<	2~	9~
LONZEE	Na	23		6~		2^		2^	2^	3~	3~<	6~	9~	3~<	2^	9~
BIERWART	Na	30		6~	6y	2~		2^	2~	3~	3~<	6~	9~	C~	2~	9~
MAZY	Na	44		6~	3~	2~	9~	2~	2~	3~	3~<	6~	9~	3~<	2~	3~
GELBRESSEE	Na	49		6~	6y	2~	9~	2~	2~	2~	3~<	6~	9~	C~	3~	9~
VEDRIN	Na	59		6~	3~	2~	9~	2~	2~	3~	3~<	6~	9~	C~	3~	9~
MOUSTIER-SUR-SAMBRE	Na	69		6~	6y	2~		2~	2~	3~	3~<	6~	9~	C~	2~	9~
LIVES-SUR-MEUSE	Na	79		6~	6y	3~	9~	3~	3~	3~	3~<	6~	9~	C~	3~	9~
ANDENNE	Na	84		6~	6y	3~		3~	3~	3~	3~<	6~	9~	C~	3~	9~
FAULX-LES-TOMBES	Na	99		6~	6y	3~	9~	3~	3~	3~	3~<	6~	9~	C~	3~	9~
OHEY	Na	101		6~	6y	3~	9~	3~	3~	3~	3~<	6~	9~	C~	3~	9~
ARSIMONT	Na	107		6~	6y, 3~	2~	9~	2~	2~	3~	3~<	6~	9~	C~	2~	3~
FOSSE-LA-VILLE	Na	109		6~	6y	3~		3~	3~	3~	3~<	6~	9~	C~	3~	9~
BOIS-DE-VILLERS	Na	112		6~	6y	3~		3~	3~	3~	3~<	6~	9~	C~		9~
MAILLEN	Na	116		6~	3~	3~	9~	3~	3~	3~	3~<	6~	9~	C~	3~	9~
SOREE	Na	120	*			3~						6~				
CRUPET	Na	127		6~		3~	9~	3~	3~	3~	3~<	6~	9~	C~	3~	9~
FLOREE	Na	129		6~	6y	3~	9~	3~	3~	3~	3~<	6~	9~	C~		9~
BIESME	Na	130		6~	2^	2^	9~	2^		3~	3~<	6~	U~	3~<		3~
DENEE	Na	135		6~	6y, 3~	3~		3~	3~	3~	3~<	6~	9~	C~		9~
GOURDINNE	Ph	6		6~		3~		3~	3~	3~	3~<	6~	9~	C~	3~	C~
MORIALME	Ph	15		6~	3~	3~	9~	3~	3~	3~	3~<	6~	9~	3~<	3~	C~
STAVE	Ph	16		6~		3~		3~	3~	3~	3~<	6~	9~	C~, 3~<		C~
MORVILLE	Ph	33		6~	3~	3~	9~	3~	3~	3~	3~<	6~	9~	C~	3~	9~
JAMAGNE	Ph	37		6~		3~	9~	2^	3~	3~	3~<	6~	9~	C~	3~	C~
FRANCHIMONT	Ph	42		6~	2^	2^	9~	2^	2^	3~	3~<	6~	9~	C~	2~	3~
CERFONTAINE	Ph	45		6~		3~		3~	3~	3~	3~<	6~	8, 9~	C~, 3~<		C~
GOCHENEE	Ph	53		6~		2^		2^	3~	3~	3~<	6~	9~	C~, 3~<	3~	3~
ROLY	Ph	54		6~		2^	9~	2^	2^	3~	3~<	6~	9~	3~<	3~	C~

PLACENAME	ARR.	COMM.	~BASE	MANSIONE	NE GENTE	PISC+ONE	POENA	RENE	RUM(I)CE	SEPTIMANA	SIMIU	SINGULARE	UMBRA	UNU	VENA
BRAINE-LE-CHATEAU	Ni	36		8	1	9~	3~n	6~y	9~	3~n	3~	6~	9~	C~y>	3~n
BRAINE-L 'ALLEUD	Ni	38		8	1	9~	3~n	3~	9~	3~n	2~	3~	9~	C~>	3~n
OHAIN	Ni	39		8n	2~, 2	9~	3~n	3~	9~	3~n	3~	3~	9~	C~>	3~n
LONGUEVILLE	Ni	45		8n	1	9~	3~n	3~	9~	3~n	2~	3~	9~	9~	3~n<
OTTIGNIES-LOUVAIN-LA-NEUVE	Ni	61		8n	2~	9~	3~n	3~	9~	3~n	3~	3~	9~	3~>	3~n
CORROY-LE-GRAND	Ni	62	*			9~	3~n		9~	3~n					3~n
GLIMES	Ni	66	*			9~	3~n<		9~	3~n					3~n<
ITTRE	Ni	72		8	1>	9~	3~n	6~y	9~	3~n		3~	9~	C~>	3~n
LILLOIS-WITTERZEE	Ni	74	*			9~	3~n		9~	3~n					3~n
TOURINNES-SAINT-LAMBERT	Ni	80		8n	2^, 2	9~	3~n<	3~	9~	3~n	2^	3~	9~	0^	3~n<
FOLX-LES-CAVES	Ni	85		8n	2~	9~	3~n<	3~	9~	3~n	2~	6~	9~	9~	3~n<
GENAPPE	Ni	90		8	1	9~	3~n	3~	9~	4n	3~	3~	9~	C~>	3~n
HEVILLERS	Ni	93		8n	2~	9~	3~n	3~	9~	3~n	2~	3~	9~	9~	3~n
THOREMBAIS-SAINT-TROND	Ni	97	*	8n	2^, 2	9~		3~	9~	3~n				9~	
PERWEZ (BRABANT)	Ni	98		8n	2^	9~	3~n<	3~	9~	3~n	2^	3~	9~	9~	3~n<
MELLERY	Ni	107		8n	2~	9~	3~n		9~	3~n	2~	3~	9~	3~>	3~n
SART-DAMES-AVELINES	Ni	112		8	2~, 2	9~	3~n	3~	9~	3~n	3~	3~	9~	3~>	3~n
NAMUR	Na	1		8n	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
AISCHE-EN-REFAIL	Na	6		8n	2^	9~	3~n<	3~	9~	3~n<	2^	2^	9~	9~	3~n<
CORTIL-WODON	Na	19		8n	2^	9~	3~n<	3~	9~	3~n<		2^	9~	9~	3~n<
FORVILLE	Na	20	*	8n	3~, 2^	9~	3~n<	3~	9~	3~n<	2^	2^	9~	9~	3~n<
GEMBLOUX	Na	22		8n	2^	9~	3~n<	3~	9~	3~n<	2~	3~	9~	9~	3~n<
LONZEE	Na	23		8n	2^	9~	3~n<	3~	9~	3~n<	2^	2^	9~	9~	3~n<
BIERWART	Na	30		8n	3~, 2~	9~	3~n<	3~	9~	3~n<	2~, 2^	2^	9~	9~	3~n<
MAZY	Na	44		8n	2~	9~	3~n<	3~	9~	3~n<	2~	2~	9~	9~, 3~	3~n<
GELBRESSEE	Na	49		8n	3~, 2~	9~	3~n<	3~	9~	3~n<	2~	2~	9~	9~	3~n<
VEDRIN	Na	59		8n	2~	9~	3~n<	3~	9~	3~n<	2~	2~	9~	9~	3~n<
MOUSTIER-SUR-SAMBRE	Na	69		8n	2~	9~	3~n<	3~	9~	3~n<	2~	3~	9~	9~	3~n<
LIVES-SUR-MEUSE	Na	79		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
ANDENNE	Na	84		8n	3~	9~	3~n<	3~	9~	3~n<		3~	9~	9~	3~n<
FAULX-LES-TOMBES	Na	99		8n	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
OHEY	Na	101		9~, 8n	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
ARSIMONT	Na	107		8n, 8	2~, 2	9~	3~n<	3~	9~	3~n<	2~	3~	9~	3~>	3~n<
FOSSE-LA-VILLE	Na	109		8n	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
BOIS-DE-VILLERS	Na	112			3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
MAILLEN	Na	116		9~, 8n	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
SOREE	Na	120	*						9~						
CRUPET	Na	127		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
FLOREE	Na	129		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
BIESME	Na	130		8	2~, 2	U~	3~n<	3~	9~	3~n<	3~	3~	U~	3~>	3~n<
DENEE	Na	135		8n, 8	3~	9~	3~n<		9~	3~n<	3~	3~	9~	9~	3~n<
GOURDINNE	Ph	6		8n	3~	9~	4n<		9~	4n<	3~	3~	9~	C~>	3~n<
MORIALME	Ph	15		8n	3~	9~	4n<		9~	4n<	3~	3~	9~	C~>	5n<
STAVE	Ph	16		9~, 8	3~	9~	3~n<		9~	3~n<	2~	2~	9~	C~>	3~n<
MORVILLE	Ph	33		8n	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	C~>	3~n<
JAMAGNE	Ph	37		9~	3~	9~	4n<	3~	9~	4n<	3~	3~	9~	C~>	4n
FRANCHIMONT	Ph	42		9~	2~	9~	4n<	3~	9~	4n<	3~	3~	9~	3~>	3~n<
CERFONTAINE	Ph	45		9~	3~	9~	4n<		9~	4n<	3~	3~	9~	C~>	3~n<
GOCHENEE	Ph	53		9~	2^	9~	3~n<	3~	9~	3~n<	3~	3~	9~	3~>	3~n<

PLACENAME	ARR.	COMM.	~BASE	VENTU	VINU	LONGITUDE	LATITUDE	POPULATION	URBAN	AGRICULTUR	PASTURAGE	INDUSTRY	FORESTRY	TOURISM
BRAINE-LE-CHATEAU	Ni	36		3~	3~	4.27	50.67	4127	NO	YES	NO	YES	NO	NO
BRAINE-L 'ALLEUD	Ni	38		3~	3~	4.37	50.67	12026	YES	NO	NO	YES	NO	NO
OHAIN	Ni	39		3~	2~	4.47	50.68	2169	NO	YES	NO	NO	NO	NO
LONGUEVILLE	Ni	45		3~	2^	4.73	50.70	465	NO	YES	NO	YES	NO	NO
OTTIGNIES-LOUVAIN-LA-NEUVE	Ni	61		3~	2~	4.57	50.67	3786	NO	YES	NO	YES	NO	NO
CORROY-LE-GRAND	Ni	62	*			4.67	50.65	951	NO	YES	NO	NO	NO	NO
GLIMES	Ni	66	*			4.83	50.67	412	NO	YES	NO	NO	NO	NO
ITTRE	Nl	72		3~	3~	4.25	50.65	2561	NO	YES	NO	NO	NO	NO
LILLOIS-WITTERZEE	Ni	74	*			4.35	50.63	1222	NO	YES	NO	NO	NO	NO
TOURINNES-SAINT-LAMBERT	Ni	80		3~	2^	4.72	50.63	1357	NO	YES	NO	YES	NO	NO
FOLX-LES-CAVES	Ni	85		3~	2~g	4.93	50.65	500	NO	YES	NO	NO	NO	NO
GENAPPE	Ni	90		3~	2	4.45	50.60	1837	NO	YES	NO	YES	NO	NO
HEVILLERS	Ni	93		3~	2~	4.62	50.62	797	NO	YES	NO	NO	NO	NO
THOREMBAIS-SAINT-TROND	Ni	97	*		2^	4.78	50.63	923	NO	YES	NO	NO	NO	NO
PERWEZ (BRABANT)	Ni	98		3~	2^	4.80	50.62	2587	YES	YES	NO	NO	NO	NO
MELLERY	Ni	107		3~	2~	4.57	50.57	486	NO	YES	NO	NO	NO	NO
SART-DAMES-AVELINES	Ni	112		3~	2~	4.48	50.57	1828	NO	YES	NO	NO	NO	NO
NAMUR	Na	1		3~	3~	4.85	50.45	31444	YES	NO	NO	YES	NO	NO
AISCHE-EN-REFAIL	Na	6		3~	2^	4.83	50.60	983	NO	YES	NO	NO	NO	NO
CORTIL-WODON	Na	19		3~	2^	4.95	50.55	699	NO	YES	NO	NO	NO	NO
FORVILLE	Na	20	*		2^	5.00	50.57	1067	NO	YES	NO	NO	NO	NO
GEMBLOUX	Na	22		3~	2~	4.68	50.55	5350	YES	YES	NO	YES	NO	NO
LONZEE	Na	23		3~	2^	4.72	50.55	1448	NO	YES	NO	NO	NO	NO
BIERWART	Na	30		3~	2~	5.03	50.55	369	NO	YES	NO	NO	NO	NO
MAZY	Na	44		3~	2~	4.67	50.50	952	NO	YES	NO	YES	NO	NO
GELBRESSEE	Na	49		3~	2~	4.95	50.52	442	NO	YES	NO	NO	NO	NO
VEDRIN	Na	59		3~	2~	4.87	50.50	2668	NO	YES	NO	NO	NO	NO
MOUSTIER-SUR-SAMBRE	Na	69		3~	2~	4.68	50.47	2564	NO	YES	NO	YES	NO	NO
LIVES-SUR-MEUSE	Na	79		3~	3~	4.92	50.45	375	NO	YES	NO	NO	YES	NO
ANDENNE	Na	84		3~	3~	5.10	50.48	7877	YES	NO	NO	YES	NO	NO
FAULX-LES-TOMBES	Na	99		3~	3~	5.02	50.42	1054	NO	YES	NO	NO	NO	NO
OHEY	Na	101		3~	3~	5.12	50.43	1091	NO	YES	NO	NO	NO	NO
ARSIMONT	Na	107		3~	2~	4.63	50.42	2256	NO	YES	NO	YES	NO	NO
FOSSE-LA-VILLE	Na	109		3~	3~	4.68	50.38	3516	YES	YES	NO	NO	NO	NO
BOIS-DE-VILLERS	Na	112		3~	3~	4.82	50.38	1480	NO	YES	NO	NO	NO	NO
MAILLEN	Na	116		3~	3~	4.97	50.37	580	NO	YES	NO	NO	NO	NO
SOREE	Na	120	*			5.12	50.40	495	NO	YES	NO	NO	NO	NO
CRUPET	Na	127		3~	3~	4.95	50.33	377	NO	YES	NO	NO	NO	NO
FLOREE	Na	129		3~	3~	5.07	50.37	423	NO	YES	NO	NO	NO	NO
BIESME	Na	130		3~	2~	4.60	50.33	1611	NO	YES	NO	NO	YES	NO
DENEE	Na	135		3~	3~	4.75	50.32	804	NO	YES	NO	YES	NO	NO
GOURDINNE	Ph	6		3~	3~	4.45	50.28	535	NO	YES	NO	YES	NO	NO
MORIALME	Ph	15		3~	3~	4.55	50.27	1276	NO	YES	NO	YES	YES	NO
STAVE	Ph	16		3~	2~	4.65	50.28	636	NO	YES	NO	NO	NO	NO
MORVILLE	Ph	33		3~	3~	4.73	50.23	469	NO	YES	NO	NO	YES	NO
JAMAGNE	Ph	37		3~	3~	4.52	50.22	302	NO	YES	NO	NO	NO	NO
FRANCHIMONT	Ph	42		3~	3~	4.63	50.20	307	NO	YES	NO	NO	NO	NO
CERFONTAINE	Ph	45		3~	3~	4.40	50.17	1771	NO	YES	NO	YES	YES	NO
GOCHENEE	Ph	53		3~	3~	4.75	50.18	340	NO	YES	NO	NO	YES	NO
ROLY	Ph	54		3~	3~	4.53	50.13	208	NO	YES	NO	NO	YES	NO

PLACENAME	ARR.	COMM.	~BASE	ANNU	BA(L)NEU	BENE	BONU	CANE	CINQUE	DENTE	FAME	GAMBA	HOMO	IUNIU	LINEU	LUNIS DIE
GIMNEE	Ph	61		6~	3~	2	9~	2	2	3~	3~<	6~	9~	C~		3~
BOUSSU-EN-FAGNE	Ph	69		6~	3~	3	9~	2	3	3~	3~<	6~	9~	3~<	3~	C~
PETIGNY	Ph	79		6~		2		2	2	3~	3~<	6~	9~	C~	3~	C~
VIERVES-SUR-VIROIN	Ph	81		6~	3~	2	0	2	2	3~	3~<	6~	9~	C~		3~
OIGNIES-EN-THIERACHE	Ph	84		6~	2^	3	0^	2^	2	2^	2^<	6^	6~, 9~	3~<	3~	C~
BRULY-DE-PESCHE	Ph	86		6~	3~	2^		3^	3~	3~	3~<	6~	9~	3~<		C~
CHOOZ (FRANCE)	Ar	1		6~	3~	3~	9~	3~	3~	3~	3~<	6~	9~	3~<	3~	3~
HARGNIES (FRANCE)	Ar	2		6~	3~	3~	9~	4>	3~	3~	3~<	6~	9~	3~<	3~	3~
YVOIR	D	7		6~		3~		3~	3~	3~	3~<	6~	9~	C~	3~	9~
FLOSTOY	D	15		6~		3~	9~	3~	3~	3~	3~<	6~	9~	C~		9~
CINEY	D	25		6~		3~		3~	3~	3~	3~<	6~	9~	C~	3~	9~
PORCHERESSE (HAVELANGE)	D	30		9~		3~	9~	3~	3~	3~	3~<	9~	9~	C~		9~
MEAN	D	34		9~	6y	3~	9~	3~	3~	3~	3~<	9~	9~	C~	3~	9~
FALAEN	D	36		6~	6y, 3~	3~	9~	3~	3~	3~	3~<	6~	9~	C~		9~
BOUVIGNIES-SUR-MEUSE	D	38		6~	6y	3~		3~	3~	3~	3~<	6~	9~	C~	3~	9~
THYNES	D	40		6~	3~	3~	9~	3~	3~	3~	3~<	6~	9~	C~		9~
HEURE	D	46		6~	6y	3~		3~	3~	3~	3~<	6~m	9~	3~<	3~	9~
SERINCHAMPS	D	58		6~		3~	9~	3~	3~	3~	3~<	6~	9~	C~		9~
FRONVILLE	D	64		6~		3~	9~	3~	3~	3~	3~<	6~m	9~	C~		9~
FALMIGNOUL	D	68		6~		3~	9~	3~	3~	3~	3~<	6~	9~	3~<	3~	C~
CELLES (HOUYET)	D	72		6~	3~	3~	9~	3~	3~	3~	3~<	6~	9~	C~	3~	9~
CUSTINNE	D	73		6~	3~	3~	9~	3~	3~	3~	3~<	6~	9~	C~	3~	9~
CIERGNON	D	81		6~		3~	9~	3~	3~	3~	3~<	6~	9~	C~	3~	9~
WIESME	D	84		6~	3~	3~	9~	3~	3~	3~	3~<	6~	9~	3~<	3~	9~
WINENNE	D	94		6~		3~	9~	3~	3~	3~	3~<	6~	9~	3~<	3~	C~
BEAURAING	D	96		6~	6y	3~	9~	3~	3~	3~	3~<	6~	9~	C~	3~	9~
HAN-SUR-LESSE	D	101		6~	6y	3~		3~	3~	3~	3~<	6~m	9~	C~	3~	9~
RESTEIGNE	D	103	*			3~		3~			3~<	6~				9~
BOURSEIGNE-NEUVE	D	110		6~	3~	3~		3~	3~	3~	3~<	6~	9~		3~	3~
FROIDFONTAINE	D	113		6~	3~	3~	9~	3~	3~	3~	3~<		9~	3~<	3~	9~
GEDINNE	D	120		6~		3~	9~	3~	3~	3~	3~<	6~	9~	3~<	3~	3~
BELLEFONTAINE (BIEVRE)	D	123		6~	3~	3~	9~	3~	3~	3~	3~<	6~	9~	3~<	3~	3~
NAOME	D	132		6~	3~	3~	9~	3~	3~	3~	3~<	6~	9~	3~<	3~	3~
LAFORET	D	136		6~		3~	9~	4^g	3~	3~	3~<	6~	9~	3~<	3~	3~
WAREMME	W	1		9~	6y	4y		4y	4y	3~	3~	9~	9~	C~	3~	9~
RACOUR	W	2	*	9~		D		D	2~	3~	3~<	9~		C~		9~
PELLAINES	W	3		9~	6y	2~		2~	2~	3~	3~<	9~	9~	C~	2~	9~
OLEYE	W	8	*		6y	4y	9~	4y	4y	3~	3~	6~m				
BERGILERS	W	10		6~	6y	4y	9~	4y	4y	3~	3~	6~m	9~	C~		9~
OREYE	W	13		7~	6y	4y		4y	4y	3~	3~	7~	7~	C~		7~
BERTREE	W	21		9~	6y	3~		3~	3~	3~	3~<	9~	9~	C~	3~	9~
ODEUR	W	30		6~	6y	4y		4y	4y	3~	3~	6~m	9~	C~	3~	9~
HANNUT	W	32	*	9~		3~	9~		3~	3~	3~<	9~				
GEER	W	35		9~	6y	2~	9~	3~	3~	3~	3~<	9~	9~	C~	3~	9~
DARION	W	36	*	9~	6y	2~		3~		3~	3~<	9~			3~	
REMICOURT	W	39	*	7~	6y	4y	9~	4y	4y	3~	3~	7~m		C~		
KEMEXHE	W	42	*	7~	6y	4y		4y	4y		3~	9~, 7~m		C~	3~	
CREHEN	W	45	*	9~		3~	9~		3~	3~	3~<	9~				
AMBRESIN	W	59		6~	6y	5~y	9~	5~y	3~	3~	5~y<	9~	9~	C~		9~
LATINNE	W	63		6~g	6y	6y	9~	6y	3~	3~		9~	9~	C~	3~	9~

PLACENAME	ARR.	COMM.	~BASE	MANSIONE	NE GENTE	PISC+ONE	POENA	RENE	RUM(I)CE	SEPTIMANA	SIMIU	SINGULARE	UMBRA	UNU	VENA
GIMNEE	Ph	61		9~	2	9~	3~n<	3~	9~	3~n<	3~	3~	9~	3~>	3~n<
BOUSSU-EN-FAGNE	Ph	69		9~	2	9~	4n<	3~	9~	4n<	3~	3~	9~	C~>	3~n<
PETIGNY	Ph	79		9~	2	9~	4n<	3~	9~	4n<	3~	3~	9~	C~>	3~n<
VIERVES-SUR-VIROIN	Ph	81		9~	2	9^	4n<	3~	9~	4n<	3~	3~	9~	3~>	3~n<
OIGNIES-EN-THIERACHE	Ph	84		9~	2	9^	4n<	3~	9^	4n<	2^	3~	9~, 9^	3~>	4n<
BRULY-DE-PESCHE	Ph	86		9~, 8	2~, 2	9~	4n<	3~	9~	4n<	3~	3~		C~>	3~n<
CHOOZ (FRANCE)	Ar	1		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	3~>	3~n<
HARGNIES (FRANCE)	Ar	2		8	4>	7~	4n<	3~	4<	3~n<	3~	4	9~	3~	3~n<
YVOIR	D	7		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
FLOSTOY	D	15		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
CINEY	D	25		9~	3~		3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
PORCHERESSE (HAVELANGE)	D	30		8n	3~	9~	3~n<	3~	9~	4n	3~	3~	9~	9~	3~n<
MEAN	D	34		9~	3~	9~	9~n	3~		3~n	3~	3~	9~	9~	9~n
FALAEN	D	36		9~, 8n	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
BOUVIGNIES-SUR-MEUSE	D	38		9~, 8n	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
THYNES	D	40		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
HEURE	D	46		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
SERINCHAMPS	D	58		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
FRONVILLE	D	64		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
FALMIGNOUL	D	68		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
CELLES (HOUYET)	D	72		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
CUSTINNE	D	73		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n<
CIERGNON	D	81		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n
WIESME	D	84		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n
WINENNE	D	94		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	3~>	3~n<
BEAURAING	D	96		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	3~n
HAN-SUR-LESSE	D	101		9~	3~	9~	9~n	3~	9~	3~n<	3~	3~	9~	9~	9~n
RESTEIGNE	D	103	*	9~					9~	3~n<		3~			
BOURSEIGNE-NEUVE	D	110		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	3~>	3~n<
FROIDFONTAINE	D	113		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	U~	3~n<
GEDINNE	D	120		9~	3~	9~	9~n	3~	9~	3~n<	3~	3~	9~	3~>	9~n
BELLEFONTAINE (BIEVRE)	D	123		9~	3~	9~	9~n	3~	9~	3~n	3~	2~	9~	3~>	9~n
NAOME	D	132		9~	3~	9~	9~n	3~	9~	3~n<	3~	3~	9~	3~>	9~n
LAFORET	D	136		9~	3~	9~	9~n	3~	9~	3~n<	3~	6~	9~	3~>	3~n
WAREMME	W	1		8n	2	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
RACOUR	W	2	*			9~	3~n<		9~	3~n			9~		3~n<
PELLAINES	W	3		8n	1>	9~	3~n<	3~	9~	3~n	3~	3~	9~	9~	3~n<
OLEYE	W	8	*	8n			9~n		9~	3~n					
BERGILERS	W	10		8n	1	9~	9~n	3~	9~	3~n		3~	9~	9~	3~n<
OREYE	W	13		8n	1	7~	7~n	3~	7~	3~n		3~	7~	7~	0n
BERTREE	W	21		8n	2	9~	3~n<	3~	9~	3~n		3~	9~	9~	3~n<
ODEUR	W	30		8n	1	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
HANNUT	W	32	*			9~	3~n<		9~	3~n					3~n<
GEER	W	35		8n	3~	9~	3~n<	3~	9~	3~n		3~	9~	9~	3~n<
DARION	W	36	*	8n	3~	9~	3~n<	3~	9~	3~n					3~n<
REMICOURT	W	39	*	8n	1	7~	9~n	3~	9~	3~n			9~		9~n
KEMEXHE	W	42	*	8n	1	9~		3~	9~	3~n			9~		
CREHEN	W	45	*			9~	3~n<		9~	3~n					3~n<
AMBRESIN	W	59		8n	3~	7~	3~n<	3~g	9~	3~n	3~	3~	9~	9~	3~n<
LATINNE	W	63		8n	3~	6~g	3~n<	3~	9~	3~n		3~	9~	9~	3~n<

PLACENAME	ARR.	COMM.	~BASE	VENTU	VINU	LONGITUDE	LATITUDE	POPULATION	URBAN	AGRICULTUR	PASTURAGE	INDUSTRY	FORESTRY	TOURISM
GIMNEE	Ph	61		3~	3~	4.70	50.12	475	NO	YES	NO	NO	YES	NO
BOUSSU-EN-FAGNE	Ph	69		3~	3~	4.47	50.07	457	NO	YES	YES	NO	YES	NO
PETIGNY	Ph	79		3~	3~	4.53	50.05	807	NO	YES	YES	NO	YES	NO
VIERVES-SUR-VIROIN	Ph	81		3~	3~	4.63	50.07	570	NO	YES	YES	NO	YES	NO
OIGNIES-EN-THIERACHE	Ph	84		2^	3~	4.63	50.02	858	NO	YES	YES	NO	YES	NO
BRULY-DE-PESCHE	Ph	86		3~	2~, 3~	4.45	50.00	115	NO	YES	YES	NO	YES	NO
CHOOZ (FRANCE)	Ar	1		3~	3~	4.80	50.10	556	NO	YES	NO	NO	YES	NO
HARGNIES (FRANCE)	Ar	2		3~	3~	4.80	50.02	564	NO	YES	NO	NO	YES	NO
YVOIR	D	7		3~	3~	4.87	50.32	1921	NO	YES	NO	YES	YES	NO
FLOSTOY	D	15		3~	3~	5.18	50.38	635	NO	YES	NO	NO	NO	NO
CINEY	D	25		3~	3~	5.10	50.28	6128	YES	YES	NO	YES	NO	NO
PORCHERESSE (HAVELANGE)	D	30		3~	3~	5.23	50.33	220	NO	YES	NO	NO	NO	NO
MEAN	D	34		3~	3~	5.33	50.35	404	NO	YES	NO	NO	NO	NO
FALAEN	D	36		3~	3~	4.78	50.27	589	NO	YES	NO	NO	NO	NO
BOUVIGNIES-SUR-MEUSE	D	38		3~	3~	4.88	50.27	1033	NO	NO	NO	NO	NO	NO
THYNES	D	40		3~	3~	4.98	50.27	517	NO	YES	NO	NO	NO	NO
HEURE	D	46		3~	3~	5.28	50.28	359	NO	YES	NO	NO	YES	NO
SERINCHAMPS	D	58		3~	3~	5.23	50.22	854	NO	YES	NO	NO	YES	NO
FRONVILLE	D	64		3~	3~	5.42	50.28	469	NO	YES	NO	NO	YES	NO
FALMIGNOUL	D	68		3~	3~	4.88	50.20	464	NO	YES	NO	NO	NO	NO
CELLES (HOUYET)	D	72		3~	3~	5.00	50.22	715	NO	YES	NO	NO	YES	NO
CUSTINNE	D	73		3~	3~	5.03	50.20	292	NO	YES	NO	NO	YES	NO
CIERGNON	D	81		3~	3~	5.08	50.17	317	NO	YES	NO	NO	YES	NO
WIESME	D	84		3~	3~	4.97	50.13	197	NO	YES	NO	NO	YES	NO
WINENNE	D	94		3~	3~	4.88	50.10	1196	NO	YES	NO	NO	YES	NO
BEAURAING	D	96		3~	3~	4.95	50.10	2268	YES	YES	NO	NO	NO	NO
HAN-SUR-LESSE	D	101		3~	3~	5.18	50.12	580	NO	YES	NO	NO	NO	YES
RESTEIGNE	D	103	*			5.17	50.08	0	NO	NO	NO	NO	NO	NO
BOURSEIGNE-NEUVE	D	110		3~	3~	4.85	50.02	233	NO	YES	NO	NO	YES	NO
FROIDFONTAINE	D	113		6~	3~	5.00	50.05	180	NO	YES	NO	NO	YES	NO
GEDINNE	D	120		6~	3~	4.93	49.97	915	NO	YES	NO	NO	YES	NO
BELLEFONTAINE (BIEVRE)	D	123		6~	3~	4.97	49.92	839	NO	YES	NO	NO	YES	NO
NAOME	D	132		6~	3~	5.08	49.92	366	NO	YES	NO	NO	YES	NO
LAFORET	D	136		6~	3~	4.92	49.85	177	NO	YES	NO	NO	YES	NO
WAREMME	W	1		3~	4y	5.25	50.68	4963	YES	YES	NO	YES	NO	NO
RACOUR	W	2	*			5.02	50.73	1089	NO	YES	NO	NO	NO	NO
PELLAINES	W	3		3~	2~	5.00	50.72	362	NO	YES	NO	NO	NO	NO
OLEYE	W	8	*		4y	5.27	50.70	971	NO	YES	NO	NO	NO	NO
BERGILERS	W	10		3~	4y	5.32	50.72	701	NO	YES	NO	NO	NO	NO
OREYE	W	13		3~	4y	5.35	50.72	945	NO	YES	NO	YES	NO	NO
BERTREE	W	21		3~	3~	5.08	50.68	381	NO	YES	NO	NO	NO	NO
ODEUR	W	30		3~	4y	5.40	50.70	303	NO	YES	NO	NO	NO	NO
HANNUT	W	32	*			5.07	50.67	2601	NO	YES	NO	NO	NO	NO
GEER	W	35		3~	3~	5.17	50.67	469	NO	YES	NO	NO	NO	NO
DARION	W	36	*			5.18	50.65	119	NO	YES	NO	NO	NO	NO
REMICOURT	W	39	*		4y	5.32	50.67	1170	NO	YES	NO	YES	NO	NO
KEMEXHE	W	42	*		4y	5.40	50.68	521	NO	YES	NO	NO	NO	NO
CREHEN	W	45	*			5.05	50.65	579	NO	YES	NO	NO	NO	NO
AMBRESIN	W	59		3~	3~oy	5.03	50.62	552	NO	YES	NO	NO	NO	NO
LATINNE	W	63		3~	6y	5.15	50.62	876	NO	YES	NO	NO	NO	NO

PLACENAME	ARR.	COMM.	~BASE	ANNU	BA(L)NEU	BENE	BONU	CANE	CINQUE	DENTE	FAME	GAMBA	HOMO	IUNIU	LINEU	LUNIS DIE
HANEFFE	W	66		6~, 7~	6y	2y		2y	2y	3~	3~	7~	9~	B		9~
HUY	H	1		9~	6y	3~	9~	3~	3~	3~	3~<	9~	9~	C~		9~
LES WALEFFES	H	2		7~	6y	2y	9~	2y	3~	3~	3~<	7~	9~	C~		9~
WARNANT-DREYE	H	8		7~		3~	9~	3~	3~	3~	3~<	6~	7~, 9~	C~	3~	9~
JEHAY-BODEGNEE	H	21		7~	6y	3~		3~	3~	3~	3~<	7~	9~	C~	3~	9~
AMPSIN	H	27		9~	6y	3~		3~	3~	3~	3~<	9~	9~	C~	3~	9~
AMAY	H	28	*	7~	6y	3~		3~	3~	3~	3~<	7~		C~		9~
COUTHUIN	H	37		9~	6y	3~	9~	3~	3~	3~	3~<	9~	9~	C~		9~
BEN-AHIN	H	38		9~	6y	3~	9~	3~	3~	3~	3~<	9~	9~	C~	3~	9~
BAS-OHA	H	39	*	9~	6y	3~		3~	3~	3~	3~<	9~		C~		9~
NEUVILLE-SOUS-HUY	H	42	*	9~		3~		3~	3~		3~<	9~		3~<		9~
VIERSET-BARSE	H	45	*	7~		3~		3~	3~	3~	3~<	7~		C~		9~
STREE (LIEGE)	H	46		9~	6y	3~	9~	3~	3~	3~	3~<	7~	9~	C~	3~	9~
NANDRIN	H	49		9~	6y	3~		3~	3~	3~	3~	9~	9~	C~		9~
TAVIER	H	50		7~	6y	3~		3~	3~	3~	3~	7~	9~	C~		9~
MARCHIN	H	53		9~	6y	3~		3~	3~	3~	3~<	9~	9~	C~		9~
XHORIS	H	67		6~	6y	3~	9~	3~	3~	3~	3~	6~	9~	C~		9~
HARZE	H	68		6~	6y	3~	9~	3~	3~	3~	3~	6~	9~	C~		9~
PAILHE	H	69		6~, 7~	6y	3~	9~	3~	3~	3~	3~<	7~	9~	C~	3~	9~
HAMOIR	H	74	*			3~		3~	3~	3~	3~	6~		C~		
LIEGE	L	1		6~	6y	3~	9~	3~	3~	3~	3~	6~	9~	C~		9~
EBEN-EMAEL	L	2		7~	6y	6~		6g	6gy, 4y	3~	3~	7~m	9~	C~	3~	9~
BASSENGE	L	4		6^	6y	4y		4y	4^	4^	4^	7^m	9^, 8^	B		9~
GLONS	L	7		9~	6y	4y		3~	3~	3~	3~	9~m	9~	C~		9~
HEURE-LE-ROMAIN	L	14		7~	6y	4y	9~	4y	3~	3~	3~	7~m	9~	3~<		9~
WARSAGE	L	19		6~	6y	2		4^	2	3~	3~	6~	8^	B		8^
ARGENTEAU	L	29		6~	6y	3~	9~	3~	3~	3~	3~	6~	9~	C~		9~
DALHEM	L	32	*			3~		3~	3~	3~	3~	6~		C~		
HOGNOUL	L	35			6y	4y	9~	4y	4y	3~	3~	9~m	9~	C~		9~
LIERS	L	39		6~	6y	3y		3y	3~	3~	3~	6~	9~	C~		9~
TREMBLEUR	L	43		6~	6y	2		2	2	3~	3~	6~	0	B		0
VOROUX-GOREUX	L	45		7~	6y	4y	9~	4y	4y	3~	3~	7~m	9~, 8	C~, B		9~, 8
MONTEGNEE	L	61		8	6y	4y	8	4y	4y	4	4	8, 8m	u	B		8
JUPILLE-SUR-MEUSE	L	66		7, 8, 6~g	6y	4g		2g	2	3~	3~	6	0	C~	2	0
MELEN	L	71	*	6^					2	3~	3^	6^	0	D^y		0^
SERAING (LIEGE)	L	75	*			3^		3^		3^	3^					
AWIRS	L	85		7^	6y	3^	9~	3^, 4y	3^	3^	3^	6^	9^	C~		8^
FLEMALLE-HAUTE	L	87		7^	6y	4y	9~	4y	3^	3^	3^	6^m	9^	B		8^
AYENEUX	L	94		6~		3~g	9~	3~g	2	3~	3~g	6^	0, 0^	C~yg		0^
EMBOURG	L	101		6~	6y	3~		3~	3~	3~	3~	6~	9~	C~		9~
ESNEUX	L	106		7~	6y	3~		3~	3~	3~	3~	7~	9~	C~		9~
SPRIMONT	L	113		6~	6y	3~		3~	3~	3~	3~	6~	9~	C~		9~
LOUVEIGNE	L	114		6~	6y	3~		3~	3~	3~	3~	6~	9^	C~		0^
COMBLAIN-AU-PONT	L	116		6~	6y	3~		3~	3~	3~	3~	6~	9~	4~		9~
VERVIERS	Ve	1		6^g	6y	4^g		4g	2	3^	4g	6^	0	D^g		0
CHARNEUX	Ve	6		6	6y	2		2	2	5	5	6	0	B		0
CLERMONT-THIMISTER	Ve	8		6^	6y	2	0	2	2	4^	4^	6	0	B		0
LIMBOURG	Ve	24		6^	6y	3^	8^	3^	2	4	4~*	6^	0, 0^	4^<		0
CORNESSE	Ve	26		6~		3^	9~	3~g	3~	3~	3~	6^	9^, 9~	C~g	2	0^
[illegible]	Ve	31		6~	6y	4g		4g	4	4	4g	6^	9~	D^g		8^

PLACENAME	ARR.	COMM.	~BASE	MANSIONE	NE GENTE	PISC+ONE	POENA	RENE	RUM(I)CE	SEPTIMANA	SIMIU	SINGULARE	UMBRA	UNU	VENA
HANEFFE	W	66		8n	2	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
HUY	H	1		8n	3~	9~	3~n<	3~	9~	3~n		3~	9~	9~	3~n<
LES WALEFFES	H	2		8n	3~	9~	3~n<	3~	9~	3~n		3~	9~	9~	3~n<
WARNANT-DREYE	H	8		8n	3~	9~	3~n<	3~	9~	3~n, 3~n<	3~	3~	7~	7~	3~n
JEHAY-BODEGNEE	H	21		8n	3~	9~	3~n<	3~	9~	3~n		3~	9~	9~	3~n<
AMPSIN	H	27			3~	9~	3~n<		9~	3~n	3~	3~	9~	9~	3~n<
AMAY	H	28	*	8n			3~n<		9~	3~n					3~n<
COUTHUIN	H	37		8n	3~	9~	3~n<	3~	9~	3~n	3~	3~	9~	9~	3~n<
BEN-AHIN	H	38		8n	3~	9~	3~n<	3~	9~	3~n		3~	9~	9~	3~n<
BAS-OHA	H	39	*	8n			3~n<	3~	9~	3~n					3~n<
NEUVILLE-SOUS-HUY	H	42	*	8n			3~n<		9~	3~n					3~n<
VIERSET-BARSE	H	45	*				3~n<			3~n					3~n<
STREE (LIEGE)	H	46		8n	3~	9~	3~n<	3~	9~	3~n		3~	9~	9~	3~n<
NANDRIN	H	49		8n	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
TAVIER	H	50		8n	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
MARCHIN	H	53		8n	3~	9~	3~n<	3~	9~	3~n		3~		9~	3~n<
XHORIS	H	67		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
HARZE	H	68		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
PAILHE	H	69		8n	3~	9~	3~n<	3~	9~	3~n<		3~	9~	9~	3~n<
HAMOIR	H	74	*				9~n		9~	3~n					9~n
LIEGE	L	1		8n	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
EBEN-EMAEL	L	2		8n	2	9~	9~n, 7~n	3~	9~	3~n		3~	9~, 7~	9~	9~n, 6~n
BASSENGE	L	4		8n	2	0^	8^n	3~	9^	4^n	3~	4^	7^	9^	8^n
GLONS	L	7		8n	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
HEURE-LE-ROMAIN	L	14		8n	3~	9~	7~n	3~	9~	3~n			7~	7~	7~n
WARSAGE	L	19		8n	2	9~	8^n	3~	9~	4^n		4^	8^	8^	8^n
ARGENTEAU	L	29		8n	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
DALHEM	L	32	*	8n	3~	9~	9~n	3~	9~	3~n		3~	9~	8^	9~n
HOGNOUL	L	35		8n	1	9~	9~n	3~	9~	4^n	3~	3~	9~	9~	9~n
LIERS	L	39		8n	2	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
TREMBLEUR	L	43		8n	2	0	0n	3~	0	3~n		3~	0	0	0n
VOROUX-GOREUX	L	45		8n	2	9~, 8	9~n, 8n	3~	9~, 8	3~n	3~	3~	9~, 8	9~, 8	0n
MONTEGNEE	L	61		8n	1	8	8n	4		4n		4	8	0	8n
JUPILLE-SUR-MEUSE	L	66		8n	2	8^g	0n	3~	0	4^n		4^	0	0	0n
MELEN	L	71	*			8g	0n		0^	4^n			0		0n
SERAING (LIEGE)	L	75	*			7^	7^n		9^	4^n			9^		7^n
AWIRS	L	85		8n	3^	9^	9^n	3~	9^	3^n		3^	8^	9^	9^n
FLEMALLE-HAUTE	L	87		8n	2	9^	9^n	3~	9^	3^n		3^	8^	9^	9^n
AYENEUX	L	94		8n	2	8g	0n	3~	9^	4n		4^	0^	0	0n
EMBOURG	L	101		8n	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
ESNEUX	L	106		9~, 8n	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
SPRIMONT	L	113		8n	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
LOUVEIGNE	L	114		8n	3~	9~	9~n	3~	9^	3~n		3~	9~	9^	9~n
COMBLAIN-AU-PONT	L	116		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
VERVIERS	Ve	1		0	2	8g	0n		0	4n		4^	0	0	0n
CHARNEUX	Ve	6		8n	2	0	0n	5	0	5n		5	0	0	0n
CLERMONT-THIMISTER	Ve	8		9	2	0	0n		0	4n		4^	0	0	0n
LIMBOURG	Ve	24		8n	2	8^	0n	4^	0^	4^n		4^	0	0	0n
CORNESSE	Ve	26		8n	2	9~	0n	3~	0^	4^n		3~	0^	9^	0n
POLLEUR	Ve	31		9g	4	8g	8^n	4g	9~	4n		4^	9~	8^	8^n

PLACENAME	ARR.	COMM.	~BASE	VENTU	VINU	LONGITUDE	LATITUDE	POPULATION	URBAN	AGRICULTUR	PASTURAGE	INDUSTRY	FORESTRY	TOURISM
HANEFFE	W	66		3~	2y	5.32	50.63	878	NO	YES	NO	NO	NO	NO
HUY	H	1		3~	3~	5.23	50.52	13124	YES	NO	NO	YES	NO	NO
LES WALEFFES	H	2		3~	2y	5.22	50.63	675	NO	YES	NO	NO	NO	NO
WARNANT-DREYE	H	8		3~	3~	5.22	50.58	1038	NO	YES	NO	NO	NO	NO
JEHAY-BODEGNEE	H	21		3~	3~	5.32	50.57	1146	NO	YES	NO	YES	NO	NO
AMPSIN	H	27		3~	3~	5.28	50.53	2812	NO	NO	NO	YES	NO	NO
AMAY	H	28	*			5.32	50.53	6469	NO	NO	NO	YES	NO	NO
COUTHUIN	H	37		3~	3~	5.12	50.53	2417	NO	YES	NO	YES	YES	NO
BEN-AHIN	H	38		3~	3~	5.18	50.50	2538	NO	NO	NO	YES	NO	NO
BAS-OHA	H	39	*			5.18	50.52	1252	NO	YES	NO	YES	NO	NO
NEUVILLE-SOUS-HUY	H	42	*			5.28	50.52	103	NO	YES	NO	NO	YES	NO
VIERSET-BARSE	H	45	*			5.28	50.48	1630	NO	YES	NO	YES	NO	NO
STREE (LIEGE)	H	46		3~	3~	5.32	50.48	853	NO	YES	NO	NO	NO	NO
NANDRIN	H	49		3~	3~	5.42	50.50	989	NO	YES	NO	NO	YES	NO
TAVIER	H	50		3~	3~	5.47	50.48	979	NO	YES	NO	NO	NO	NO
MARCHIN	H	53		3~	3~	5.23	50.45	4524	NO	YES	NO	YES	NO	NO
XHORIS	H	67		3~	3~	5.60	50.43	885	NO	YES	NO	NO	YES	NO
HARZE	H	68		3~	3~	5.67	50.43	1009	NO	YES	NO	NO	YES	NO
PAILHE	H	69		3~	3~	5.25	50.42	382	NO	YES	NO	NO	NO	NO
HAMOIR	H	74	*			5.53	50.42	1297	NO	YES	NO	NO	NO	YES
LIEGE	L	1		3~	3~	5.57	50.63	156208	YES	NO	NO	YES	NO	NO
EBEN-EMAEL	L	2		3~	3~	5.67	50.78	1045	NO	YES	NO	NO	NO	NO
BASSENGE	L	4		4^	4y	5.60	50.75	752	NO	YES	NO	NO	NO	NO
GLONS	L	7		3~	3~	5.53	50.75	1873	NO	YES	NO	NO	NO	NO
HEURE-LE-ROMAIN	L	14		3~	3~	5.62	50.72	1357	NO	YES	NO	NO	NO	NO
WARSAGE	L	19		4^	2	5.77	50.73	841	NO	YES	NO	NO	NO	NO
ARGENTEAU	L	29		3~	3~	5.68	50.70	858	NO	YES	NO	NO	NO	NO
DALHEM	L	32	*			5.72	50.70	929	NO	YES	NO	NO	NO	NO
HOGNOUL	L	35		3~	4y	5.45	50.67	509	NO	YES	NO	NO	NO	NO
LIERS	L	39		3~	3y	5.55	50.68	1058	NO	YES	NO	NO	NO	NO
TREMBLEUR	L	43		3~, 4^	2	5.72	50.68	2144	NO	YES	YES	YES	NO	NO
VOROUX-GOREUX	L	45		3~	4y	5.42	50.65	821	NO	YES	NO	YES	NO	NO
MONTEGNEE	L	61		4	4y	5.50	50.63	10605	NO	NO	NO	YES	NO	NO
JUPILLE-SUR-MEUSE	L	66		3~, 4^	4g, 2	5.62	50.63	8177	YES	NO	NO	YES	NO	NO
MELEN	L	71	*	4^		5.73	50.63	1747	NO	NO	YES	YES	NO	NO
SERAING (LIEGE)	L	75	*			5.50	50.60	42292	YES	NO	NO	NO	NO	NO
AWIRS	L	85		4^	4y, 3^	5.40	50.58	2390	NO	YES	NO	YES	NO	NO
FLEMALLE-HAUTE	L	87		4^	4y	5.47	50.60	6703	NO	NO	NO	YES	NO	NO
AYENEUX	L	94			3~g, 2	5.70	50.60	1103	NO	NO	YES	NO	NO	NO
EMBOURG	L	101		3~	3~	5.60	50.58	1898	NO	NO	YES	YES	NO	NO
ESNEUX	L	106		3~	3~	5.57	50.53	4810	NO	YES	YES	YES	NO	YES
SPRIMONT	L	113		3~	3~	5.65	50.50	4015	NO	YES	YES	YES	NO	NO
LOUVEIGNE	L	114		3~	3~	5.70	50.52	2025	NO	NO	YES	NO	YES	NO
COMBLAIN-AU-PONT	L	116		3~	3~	5.57	50.47	3551	NO	YES	NO	YES	NO	NO
VERVIERS	Ve	1		4^	4^g, 2	5.85	50.58	40673	YES	NO	NO	YES	NO	NO
CHARNEUX	Ve	6		5	2	5.80	50.67	1349	NO	NO	YES	NO	NO	NO
CLERMONT-THIMISTER	Ve	8		4^	2	5.88	50.65	1619	NO	NO	YES	NO	NO	NO
LIMBOURG	Ve	24		4^	4^	5.93	50.62	4168	YES	NO	NO	YES	NO	NO
CORNESSE	Ve	26		3~, 4^	2	5.78	50.57	1897	NO	NO	YES	YES	NO	NO
POULEUR	Ve	31		4g, 4	4g	5.87	50.53	1558	NO	NO	YES	YES	NO	NO

PLACENAME	ARR.	COMM.	~BASE	ANNU	BA(L)NEU	BENE	BONU	CANE	CINQUE	DENTE	FAME	GAMBA	HOMO	IUNIU	LINEU	LUNIS DIE
JALHAY	Ve	32		6, 6^g	6y	4g	0	4g	2	4^g,	4g	6	0	D^g		0
SART-LEZ-SPA	Ve	34		6^g	6y	4^g	0^	4^g	4	3^g	4^g	6^	0, 0^	D^g		0^
LA REID	Ve	35		6~	6y	3~		3~	3~	3~	3~	6~	9~	C~	3~	9~
FRANCORCHAMPS	Ve	37		6~	6y	3~		3~g	3~	3~	3~g	6^	9~	3~<		9~
STOUMONT	Ve	38		6~	6y	3~	9~	3~	3~	3~	3~	6~	9~	3~<		9~
LA GLEIZE	Ve	39		6~	6y	3~		3~g	3~	3~	3~g	6~	9~	3~<		9~
STAVELOT	Ve	40		6~	6y	3~, 3g	9~	3~, 3~g	3~	3~		6~	9~	3~<	3~	9~
CHEVRON	Ve	41		6~	6y	3~	9~	3~	3~	3~	3~	6~	9~	C~		9~
RAHIER	Ve	42		6~	6y	3~		3~	3~	3~	3~	6~	9~	C~		9~
WANNE	Ve	44		6~	6y	3~	9~	3~	3~	3~	3~	6~	9~	3~<		9~
LIERNEUX	Ve	47		6~	6y	3~	9~	3~	3~	3~	3~	6~	9~	C~		9~
MALMEDY	My	1		6, 6^g	6y	4^g		4g	4	4	4^g	6	8	3~g	3~	8
BEVERCE	My	2		6~g	6y	3~g		3~g	2^	3~	3~g	6^	9^, 0^	3~g		0^
ROBERTVILLE	My	3		6^	6y	2		3	2^	3^	3^	6^	9^	2		0^
BELLEVAUX-LIGNEUVILLE	My	4		6~	6y	3~		3~	3~		3~	6~	8	3~<	3~	9~
FAYMONVILLE	My	6		6~	6y	2g		2g	2	3~	3~	6^	0^	2g		0^
MARCHE-EN-FAMENNE	Ma	1		6~	6y	3~	9~	3~	3~	3~	3~<	6~m	9~	3~<	3~	9~
BENDE	Ma	2		9~	6y	3~		3~	3~	3~	3~	9~	9~	C~	3~	9~
BORLON	Ma	3		9~	6y	3~		3~	3~	3~	3~	9~m	9~	C~		9~
TOHOGNE	Ma	4		6~	6y	3~		3~	3~	3~	3~	6~	9~	C~		9~
DURBUY	Ma	9		6~	6y	3~	9~	3~	3~	3~	3~	6~	9~	C~		9~
VILLERS-SAINTE-GERTRUDE	Ma	12		6~	6y	3~		3~	3~	3~	3~	6~	9~	C~		9~
EREZEE	Ma	19		6~	6y	3~	9~	3~	3~	3~	3~	6~m	9~	3~<		9~
GRANDMENIL	Ma	20		6~	6y	3~	9~	3~	3~	3~	3~	6~	9~	C~		9~
BEFFE	Ma	24		6~	6y	3~	9~	3~	3~	3~	3~	6~m	9~	C~	3~	9~
DOCHAMPS	Ma	29		6~	6y	3~	9~	3~	3~	3~	3~	6~	9~	C~	3~	9~
HUMAIN	Ma	35		6~		3~		3~	3~	3~	3~<	6~m	9~		3~	9~
ON	Ma	36		6~	6y	3~	9~	3~	3~	3~	3~<	7~m	9~	C~		9~
ROY	Ma	39		6~	6y	3~		3~	3~	3~	3~<	6~m	9~	C~		9~
HALLEUX	Ma	40		6~	6y	3~		3~	3~	3~	3~<	6~m	9~	3~<	3~	9~
LA ROCHE-EN-ARDENNE	Ma	42		6~	6y	3~	9~	3~	3~	3~	3~<	6~m	9~	C~		9~
GRUNE	Ma	43		6~	6y	3~	9~	3~	3~	3~	3~<	6~m	9~	C~	3~	9~
FORRIERES	Ma	46		6~	6y	3~		3~	3~	3~	3~<	6~m	9~	3~<	3~	9~
MASBOURG	Ma	48	*					3~		3~		6~m				
TENNEVILLE	Ma	51		6~	6y	3~	9~	3~	3~	3~	3~<	6~m	9~	C~		9~
ORTHO	Ma	53		6~	6y	3~		3~	3~	3~	3~<	6~m	9~	C~	3~	9~
BASTOGNE	B	1	*			3~		3~				6~m				
GRAND-HALLEUX	B	2		6~	6y	3~		3~	3~	3~	3~	6~	9~	3~<		9~
ARBREFONTAINE	B	3	*		6y	3~		3~	3~	3~	3~	6~		3~<		
VIELSALM	B	4		6~		3~		3~	3~	3~	3~	6~	9~	3~<		9~
PETIT-THIER	B	5		6~	6y	3~		3~	3~	3~	3~	6~	9~	3~<		9~
BIHAIN	B	6		6~	6y	3~		3~	3~	3~	3~	6~	9~	C~, 3~<		9~
BOVIGNY	B	7		6~		3~		3~	3~	3~	3~	6~	9~	3~<		9~
MONTLEBAN	B	9		6~	6y	3~	9~	3~	3~	3~	3~	6~	9~	C~		9~
LIMERLE	B	11		6~	6y	3~		3~	3~	3~	3~	6~	9~	3~<		9~
NADRIN	B	12		6~	6y	3~	9~	3~	3~	3~	3~<	6~m	9~	C~		9~
HOUFFALIZE	B	15		6~	6y	3~	9~	3~	3~	3~	3~	6~, 6~m	9~	C~		9~
MABOMPRE	B	16		6~	6y	3~	9~	3~	3~	3~	3~<	6~m	9~	C~		9~
TAVIGNY	B	17	*					3~				6~m				
[illegible]	B	21		6~	6y	3~	9~	3~	3~	3~	3~<	6~m	9~	C~	3~	9~

PLACENAME	ARR.	COMM.	-BASE	MANSIONE	NEGENTE	PISCHONE	POENA	RENE	RUM(I)CE	SEPTIMANA	SIMIU	SINGULARE	UMBRA	UNU	VENA
JALHAY	Ve	32		9^g	2	8g	0n	4g	0	2n		2	0	0	0n
SART-LEZ-SPA	Ve	34		8^g, 6^g	4	8^g	0^n	4^g	0	4n		4	0^	0^	0^n
LA REID	Ve	35		9~, 8n	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
FRANCORCHAMPS	Ve	37		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
STOUMONT	Ve	38		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
LA GLEIZE	Ve	39		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
STAVELOT	Ve	40		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
CHEVRON	Ve	41		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
RAHIER	Ve	42		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
WANNE	Ve	44		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
LIERNEUX	Ve	47		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
MALMEDY	My	1		9~g	4	8^g	0n	3~g	8	2n		3~	8	8	0n
BEVERCE	My	2		9~	3^	0^	0^n	3~g	0^	3~n		4^	0^	9^	0^n
ROBERTVILLE	My	3		9^	3^, 2	0^	0^n	3^	0^	3^n		3^	0^	0^	0^n
BELLEVAUX-LIGNEUVILLE	My	4		9~	3~	9~	0n	3~	9~	4n		3~	9~	9~	0n
FAYMONVILLE	My	6		9~	2	9~	0^n	3~	8^	4n		3~	0^	0^	0^n
MARCHE-EN-FAMENNE	Ma	1		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
BENDE	Ma	2		8n	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
BORLON	Ma	3		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
TOHOGNE	Ma	4		9~	3~	9~	0^n	3~	9~	3~n	3~	3~	9~	9~	0^n
DURBUY	Ma	9		9~	3~	9~	9~n	3~	9~	4^n	3~	3~	9~	9~	9~n
VILLERS-SAINTE-GERTRUDE	Ma	12		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
EREZEE	Ma	19		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
GRANDMENIL	Ma	20		9~	3~	9~	0^n	3~	9~	4^n		3~	9~	9~	0^n
BEFFE	Ma	24		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
DOCHAMPS	Ma	29		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
HUMAIN	Ma	35		9~	3~	9~	3~n<	3~	9~	3~n	3~	3~	9~	9~	9~n
ON	Ma	36		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	0~n
ROY	Ma	39		9~	3~	9~	0~n	3~	9~	4^n, 3~n<		3~	9~	9~	0~n
HALLEUX	Ma	40		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
LA ROCHE-EN-ARDENNE	Ma	42		9~	3~	9~	9~n		9~	3~n		3~	9~	9~	9~n
GRUNE	Ma	43		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
FORRIERES	Ma	46		9~	3~	9~	9~n			3~n	3~	3~	9~	9~	9~n
MASBOURG	Ma	48	*	9~								3~	9~		
TENNEVILLE	Ma	51		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
ORTHO	Ma	53		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
BASTOGNE	B	1	*	9~					9~			3~			
GRAND-HALLEUX	B	2		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
ARBREFONTAINE	B	3	*	9~		9~	9~n	3~	9~	3~n		3~			9~n
VIELSALM	B	4		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
PETIT-THIER	B	5		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
BIHAIN	B	6		9~	3~	9~	9~n	3~	9~	3~n		3~		9~	9~n
BOVIGNY	B	7		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
MONTLEBAN	B	9		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
LIMERLE	B	11		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
NADRIN	B	12		9~	3~	9~	9~n		9~	4^n	3~	3~	9~	9~	9~n
HOUFFALIZE	B	15		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~	9~n
MABOMPRE	B	16		9~	3~	9~	9~n		9~	3~n	3~	3~	9~	9~	9~n
TAVIGNY	B	17	*	9~		9~			9~			3~		9~	
FLAMIERGE	B	21		9~	3~	9~	9~n	3~	9~	3~n		3~	9~	9~, 8	9~n

PLACENAME	ARR.	COMM.	~BASE	VENTU	VINU	LONGITUDE	LATITUDE	POPULATION	URBAN	AGRICULTUR	PASTURAGE	INDUSTRY	FORESTRY	TOURISM
JALHAY	Ve	32		4^g, 2	4^g, 2	5.95	50.55	1419	NO	NO	YES	NO	YES	NO
SART-LEZ-SPA	Ve	34		4^g, 4	4^g	5.93	50.52	2092	NO	NO	YES	NO	YES	NO
LA REID	Ve	35		3~	3~	5.78	50.48	1347	NO	NO	YES	NO	YES	NO
FRANCORCHAMPS	Ve	37		3~	3~g	5.93	50.45	1065	NO	NO	YES	NO	YES	NO
STOUMONT	Ve	38		3~	3~	5.80	50.40	515	NO	NO	YES	NO	YES	NO
LA GLEIZE	Ve	39		3~	3~g	5.83	50.40	1042	NO	NO	YES	NO	YES	NO
STAVELOT	Ve	40		3~	3~	5.92	50.38	4789	YES	NO	YES	YES	YES	NO
CHEVRON	Ve	41		3~	3~	5.72	50.37	737	NO	YES	YES	NO	NO	NO
RAHIER	Ve	42		3~	3~	5.77	50.38	387	NO	NO	YES	NO	NO	NO
WANNE	Ve	44		3~	3~	5.92	50.35	741	NO	YES	YES	NO	NO	NO
LIERNEUX	Ve	47			3~	5.78	50.28	3135	NO	YES	YES	NO	NO	NO
MALMEDY	My	1		4^, 4	4^g	6.02	50.42	5391	YES	NO	NO	YES	NO	NO
BEVERCE	My	2		3~	3~	6.03	50.43	1775	NO	NO	YES	NO	YES	NO
ROBERTVILLE	My	3		3^*, 5^*	2	6.12	50.45	1742	NO	NO	YES	NO	YES	NO
BELLEVAUX-LIGNEUVILLE	My	4		3~	3~	6.05	50.37	1046	NO	NO	YES	NO	YES	NO
FAYMONVILLE	My	6		4^	2g	6.13	50.40	714	NO	NO	YES	NO	NO	NO
MARCHE-EN-FAMENNE	Ma	1		3~	3~	5.33	50.22	4202	YES	NO	NO	NO	NO	NO
BENDE	Ma	2		3~	3~	5.40	50.42	264	NO	YES	NO	NO	NO	NO
BORLON	Ma	3		3~	3~	5.40	50.37	343	NO	YES	NO	NO	NO	NO
TOHOGNE	Ma	4		3~	3~	5.47	50.37	1330	NO	YES	NO	NO	NO	NO
DURBUY	Ma	9		3~	3~	5.45	50.35	332	YES	YES	NO	NO	NO	YES
VILLERS-SAINTE-GERTRUDE	Ma	12		3~	3~	5.57	50.35	232	NO	YES	NO	NO	YES	NO
EREZEE	Ma	19		3~	3~	5.55	50.28	864	NO	YES	NO	NO	YES	NO
GRANDMENIL	Ma	20		3~	3~	5.65	50.28	614	NO	YES	NO	NO	YES	NO
BEFFE	Ma	24		3~	3~	5.52	50.23	234	NO	YES	NO	NO	YES	NO
DOCHAMPS	Ma	29		3~	3~	5.62	50.23	527	NO	YES	NO	NO	YES	NO
HUMAIN	Ma	35		3~	3~	5.25	50.20	500	NO	YES	NO	NO	YES	NO
ON	Ma	36			3~	5.28	50.17	1550	NO	YES	NO	NO	NO	NO
ROY	Ma	39		3~	3~	5.40	50.18	602	NO	YES	NO	NO	YES	NO
HALLEUX	Ma	40			3~	5.50	50.17	212	NO	YES	NO	NO	YES	NO
LA ROCHE-EN-ARDENNE	Ma	42		3~	3~	5.57	50.18	1814	YES	YES	NO	NO	NO	YES
GRUNE	Ma	43		3~	3~	5.37	50.15	297	NO	YES	NO	NO	YES	NO
FORRIERES	Ma	46		3~	3~	5.27	50.12	1015	NO	YES	NO	NO	YES	NO
MASBOURG	Ma	48	*			5.30	50.10	258	NO	YES	NO	NO	YES	NO
TENNEVILLE	Ma	51		3~	3~	5.52	50.08	940	NO	YES	NO	NO	YES	NO
ORTHO	Ma	53		3~	3~	5.60	50.12	1056	NO	YES	NO	NO	YES	NO
BASTOGNE	B	1	*			5.70	50.00	0	NO	NO	NO	NO	NO	NO
GRAND-HALLEUX	B	2			3~	5.90	50.32	1254	NO	YES	YES	NO	YES	NO
ARBREFONTAINE	B	3	*			5.83	50.30	559	NO	YES	YES	NO	YES	NO
VIELSALM	B	4			3~	5.90	50.28	3763	NO	YES	NO	YES	NO	YES
PETIT-THIER	B	5			3~	5.97	50.30	518	NO	YES	YES	NO	YES	NO
BIHAIN	B	6			3~	5.80	50.23	1149	NO	YES	NO	NO	YES	NO
BOVIGNY	B	7			3~	5.92	50.22	1407	NO	YES	NO	NO	YES	NO
MONTLEBAN	B	9		3~	3~	5.83	50.18	633	NO	YES	NO	NO	YES	NO
LIMERLE	B	11		3~	3~	5.92	50.15	1872	NO	YES	NO	NO	YES	NO
NADRIN	B	12			3~	5.68	50.15	473	NO	YES	NO	NO	YES	NO
HOUFFALIZE	B	15			3~	5.78	50.13	1067	YES	NO	NO	NO	NO	NO
MABOMPRE	B	16			3~	5.73	50.08	789	NO	YES	NO	NO	YES	NO
TAVIGNY	B	17	*			5.83	50.10	1202	NO	YES	NO	NO	YES	NO
FLAMIERGE	B	21		3~	3~	5.60	50.03	1009	NO	YES	NO	NO	YES	NO

PLACENAME	ARR.	COMM.	~BASE	ANNU	BA(L)NEU	BENE	BONU	CANE	CINQUE	DENTE	FAME	GAMBA	HOMO	IUNIU	LINEU	LUNIS DIE
LONGCHAMPS-BERTOGNE	B	22		6~	6y	3~	9~	3~	3~	3~	3~<	6~m	9~	C~	3~	9~
LONGVILLY	B	23		6~	3~	3~	9~	3~	3~	3~	3~, 3~<	6~m	9~	C~	3~	9~
TILLET	B	24		6~		3~	9~	3~	3~	3~	3~<	6~m	9~	C~	3~	9~
WARDIN	B	27		6~	6y	3~		3~	3~	3~	3~<	6~m	9~	C~	3~	9~
VAUX-LEZ-ROSIERES	B	28		6~		3~		3~	3~	4~*	3~<	6~m	9~	C~		9~
HOMPRE	B	30		6~		3~	9~	3~	3~	4~*	3~<	6~m	9~	C~		9~
VILLERS-LA-BONNE-EAU	B	31	*			4~*				4~*		6~m				
FAUVILLERS	B	33		6~	3~	4~*	9~	4~*	3~	4~*	3~<	6~m	9~	C~	3~	C~
WELLIN	Ne	4		6~	6y	3~	9~	3~	3~	3~	3~<	6~	9~	C~	3~	9~
HALMA	Ne	5	*			3~	9~	3~				6~				9~
MIRWART	Ne	8	*			3~		3~				6~				
AWENNE	Ne	9		6~		3~		3~	3~	3~	3~<	6~	9~	C~		9~
REDU	Ne	11				3~	9~	3~	3~	3~	3~<	6~	9~	C~		3~
ARVILLE	Ne	14		6~	3~	3~	9~	3~	3~	4^	3~<	6~m	0^, 9~	C~		9~
HATRIVAL	Ne	15		6~	6y	3~	9~	3~	3~	3~	3~<	6~m	0^, 9~	C~		9~
SAINT-HUBERT	Ne	16		6~	3~	3~		3~	3~		3~<	6~	0^, 0	C~	3~	9~
VESQUEVILLE	Ne	17	*					3~				6~m				9~
GEMBES	Ne	20		6~	3~	3~		3~	3~	3~	3~<	6~	9~	C~	3~	3~
MAISSIN	Ne	22	*			3~		3~	3~					C~		3~
VILLANCE	Ne	23	*			3~	9~	3~	3~	3~	3~<	6~		C~	3~	3~
LIBIN	Ne	24				3~	9~	3~	3~	3~	3~<	6~	9~	3~<		3~
FREUX	Ne	26		6~	6y	3~	9~	3~	3~	3~	3~<	6~m	9~	3~<	3~	9~
ANLOY	Ne	31				3~	9~	3~	3~	3~	3~<	6~	9~	C~		3~
OCHAMPS	Ne	32	*		3~	4^						6~			3~	3~
RECOGNE	Ne	33		6~		3~	9~	3~	3~	3~	3~<	6~m	9~	C~		C~
JEHONVILLE	Ne	38	*													
SAINT-PIERRE	Ne	39		6~		3~	9~	3~	3~	3~	3~<	6~m	6~, 9~	C~	3~	C~
OFFAGNE	Ne	43		6~	3~	3~		3~	3~	3~	3~<	6~	9~	C~	3~	3~
BERTRIX	Ne	44		6~	3~	5~	9~	3~	3~	3~	3~<	6~	9~	3~<	3~	C~
LONGLIER	Ne	47		6~	3~	4>		4>	3~	4	3~	6~m	6~	3~<	3~	C~
EBLY	Ne	49		6~	3~	3~>		3~	3~	3~*	3~	6~	9~	3~<	3~	C~
WITRY	Ne	50	*			3~>		3~		4	3~	6~m				9~
ROCHEHAUT	Ne	51		6~	3~	3~	9~	3~	3~	3~	3~<	6~	9~	3~<	3~	3~
AUBY-SUR-SEMOIS	Ne	57		6~		3~		3~	3~	3~	3~<	6~	9~	C~	3~	3~
STRAIMONT	Ne	60		6~	3~	4>	9~	4>	3~	4	3~	6~	6~	3~<	3~	C~
ASSENOIS	Ne	63			3~	4>		4>	3~	3~*	3~	6~	6~	3~<	3~	C~
BAGIMONT	Ne	65		6~		3~	9~	3~	3~	6	3~	6m	u	3~<	3~	3~
CORBION	Ne	69		6~		3~		3~	3~	3~	3~	6~	6~, 9~	3~<	3~	C~
ANLIER	Ne	76		6~	3~	1	u .	1	3~	4~*	3~	6~	6~	3~<	3~	C~
MUNO	Vi	2		6~	4g	3~g	9~	3~*	3~	6	4g	6~	6~, 9~	4g<		C~
FLORENVILLE	Vi	6		6~	3~	3~	9~	3~	4g	6	3~	6~	6~	3~<	3~	C~
CHINY	Vi	8		6~	3~	3~g	9~	4g	4g	6	2	6~	6~	3~<	3~	C~
ROSSIGNOL	Vi	13		6~	3~	4g	9~	3~	4g	6	2	6~	6~	3~<		C~
HABAY-LA-VIEILLE	Vi	16		6~	3~	4~*	7~	4~*	4^, 2	4~*	3~	6~	6~, 7~	3~<	3~	C~
SAINT-VINCENT	Vi	18		6~	4g	4g	9~	4g	4g	4	2^	6~	6~, 7~, 9	3~<	3~	3~
BELLEFONTAINE (TINTIGNY)	Vi	21	*	6~g, 6^g		4g		4g	4g				6~, 9~	3~g<		
SAINTE-MARIE-SUR-SEMOIS	Vi	22		6^g	4g	4g		4g	4g	4	2	6~	6~	4g<	3~	C~
VILLERS-DEVANT-ORVAL	Vi	25		6~		3~		3~	3~	6	4	6~	6~	3~<	3~	C~
MEIX-DEVANT-VIRTON	Vi	27		6~	2~g	4g		4g	4g	6	2	6~	9~	3~<		C~
	Vi	33	*	6^g		3~g, 4^		3~, 4^g	4g	6	1	6~				

PLACENAME	ARR.	COMM.	~BASE	MANSIONE	NE GENTE	PISC+ONE	POENA	RENE	RUM(I)CE	SEPTIMANA	SIMIU	SINGULARE	UMBRA	UNU	VENA
LONGCHAMPS-BERTOGNE	B	22		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	0n
LONGVILLY	B	23		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
TILLET	B	24		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	8	9~n
WARDIN	B	27		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	u	9~n
VAUX-LEZ-ROSIERES	B	28		9~, 8n	4~*	9~	9~n	3~	9~	3~n	3~	3~	9~	8	9~n
HOMPRE	B	30		9~	3~	9~	9~n	3~	9~	4^n	3~	3~	9~	8	9~n
VILLERS-LA-BONNE-EAU	B	31	*	9~			3~n<					3~			
FAUVILLERS	B	33		9~	3~	9~	9~n	3~	7~	4~n*	3~	3~	9~	8	9~n
WELLIN	Ne	4		9~	3~	9~	3~n<	3~	9~	3~n<	3~	3~	9~	9~	0~n
HALMA	Ne	5	*	9~					9~	3~n<		3~			
MIRWART	Ne	8	*	9~								3~			
AWENNE	Ne	9		9~	3~	9~	9~n	3~	9~	3~n<	3~	3~	9~	9~	9~n
REDU	Ne	11		9~	3~	9~	9~n	3~	9~	3~n<	3~	3~	9~	3~	9~n
ARVILLE	Ne	14		9^	3~, 4^	0^	0^n	3~	0^	4^n	3~	3~	9~	3~	0^n
HATRIVAL	Ne	15		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	9~	9~n
SAINT-HUBERT	Ne	16		9~	3~	9^	0^n	3~	0^	4^n	3~	3~	0^	9~	0^n
VESQUEVILLE	Ne	17	*	9~								3~			
GEMBES	Ne	20		9~	3~	9~	9~n	3~	9~	3~n<	3~	3~	9~	3~>	9~n
MAISSIN	Ne	22	*	9~		9~			9~	3~n<		3~	9~	3~	
VILLANCE	Ne	23	*	9~	3~	9~	9~n	3~	9~	3~n<		3~	9~	3~	9~n
LIBIN	Ne	24		9~	3~	9~	0^n	3~	9~	3~n<	3~	3~	9~	3~	0^n
FREUX	Ne	26		9~	3~	9~	9~n	3~	9~	3~n	3~	3~	9~	8	9~n
ANLOY	Ne	31		9~	3~	9~	0~n	3~	9~	3~n<	3~	3~	9~	3~>	0~n
OCHAMPS	Ne	32	*		!		9~n	3~		3~n<		3~	9~	C~	9~n
RECOGNE	Ne	33		9~	3~	9~	9~n	3~	9~	3~n<, 3~n	3~	3~	9~	D	9~n
JEHONVILLE	Ne	38	*	9~					9~			3~	9~	3~>	
SAINT-PIERRE	Ne	39		9~	3~	9~	9~n		9~	3~n	3~	3~, 6~	9~	D	9~n
OFFAGNE	Ne	43		9~	!	9~	9~n	3~	9~	3~n<	3~	3~	9~	3~>	9~n
BERTRIX	Ne	44		9~	1	9~	9~n	3~	9~	3~n<	3~	3~	9~	C~>	9~n
LONGLIER	Ne	47			1	6~*	0~n	3~	9~	3~n	3~	6~	9~	1	9~n
EBLY	Ne	49		6~*	1	9~	9~n	3~	9~	3~n	3~	6~	9~, 7~	C~	9~n
WITRY	Ne	50	*	8n					6~			3~, 6~	6~	C~	9~n
ROCHEHAUT	Ne	51		9~	!	9~	9~n		9~	3~n<		6~	9~	3~>	9~n
AUBY-SUR-SEMOIS	Ne	57		9~	!	9~	9~n	3~	9~	3~n<	3~	3~	9~	3~>	9~n
STRAIMONT	Ne	60		6~	1	6~*	3~n	3~	9~	3~n	3~	6~	9~	1	3~n
ASSENOIS	Ne	63		8	1	9~	9~n	4	9~	3~n	3~	6~	6~	1, 2	9~n
BAGIMONT	Ne	65		u		9~	3~n		9~	3~n	3~	6~	9~	3~>	3~n
CORBION	Ne	69		9~		9~	3~n	3~	9~	3~n	3~	3~	9~	C~>	3~n
ANLIER	Ne	76		7~*	1	7~*	4n<	3~	4<	4n	1	4	6~	1	4n<
MUNO	Vi	2		9~		9~	9~n	4g	9~	3~n	3~	6	9~	C~>	3~n
FLORENVILLE	Vi	6		6~		6^g	0n	3~	9~	2n	3~	6~	6~	4g	2n
CHINY	Vi	8		6~		6^g		3~		2n	3~	6~	6~	4g	
ROSSIGNOL	Vi	13		6~		6^g	0n			2n	3~	6g	6~	4g	2n
HABAY-LA-VIEILLE	Vi	16		7~*		6g	4n, 4n<	3~	9~	4n	3~	3~	8^	2	4n
SAINT-VINCENT	Vi	18		6~		7~		4g	9~	2n	3~	6~g	6~	2~g	4n
BELLEFONTAINE (TINTIGNY)	Vi	21	*	6~		6~g				2n		6g	6~	4g	
SAINTE-MARIE-SUR-SEMOIS	Vi	22		6~		6g	0n, 4n	4g		2n	3~	6g	6~	4g	4n
VILLERS-DEVANT-ORVAL	Vi	25		9~			0n	3~	9~	4n	3~	6~g	9~, 6~	C~g	4n
MEIX-DEVANT-VIRTON	Vi	27		9~		9^g	0n	3~g	9~	2n	3~	6g	9~	4g	2n
VILLERS-LA-LOUE	Vi	32	*	9~		9^g	un			1				4^g	2n

PLACENAME	ARR.	COMM.	~BASE	VENTU	VINU	LONGITUDE	LATITUDE	POPULATION	URBAN	AGRICULTUR	PASTURAGE	INDUSTRY	FORESTRY	TOURISM
LONGCHAMPS-BERTOGNE	B	22			3~	5.68	50.05	1222	NO	YES	NO	NO	YES	NO
LONGVILLY	B	23		3~	3~	5.83	50.02	1087	NO	YES	NO	NO	YES	NO
TILLET	B	24			3~	5.52	50.00	1162	NO	YES	NO	NO	YES	NO
WARDIN	B	27			3~	5.78	49.98	1269	NO	YES	NO	NO	YES	NO
VAUX-LEZ-ROSIERES	B	28		3~	3~	5.57	49.90	492	NO	YES	NO	NO	YES	NO
HOMPRE	B	30			3~	5.68	49.93	850	NO	YES	NO	NO	YES	NO
VILLERS-LA-BONNE-EAU	B	31	*			5.73	49.93	392	NO	YES	NO	NO	YES	NO
FAUVILLERS	B	33		4~*	3~	5.67	49.85	873	NO	YES	NO	NO	YES	NO
WELLIN	Ne	4			3~	5.10	50.08	989	NO	YES	NO	NO	YES	YES
HALMA	Ne	5	*			5.13	50.07	296	NO	YES	NO	NO	YES	NO
MIRWART	Ne	8	*			5.27	50.05	0	NO	NO	NO	NO	NO	NO
AWENNE	Ne	9			3~	5.30	50.07	392	NO	YES	NO	NO	YES	NO
REDU	Ne	11		6~	3~	5.15	50.00	616	NO	YES	NO	NO	YES	NO
ARVILLE	Ne	14		6~	3~	5.32	50.02	861	NO	YES	NO	NO	YES	NO
HATRIVAL	Ne	15		6~	3~	5.33	50.00	601	NO	YES	NO	NO	YES	NO
SAINT-HUBERT	Ne	16		6~	3~	5.37	50.02	3088	YES	YES	NO	NO	YES	NO
VESQUEVILLE	Ne	17	*			5.38	50.00	0	NO	NO	NO	NO	NO	NO
GEMBES	Ne	20			3~	5.05	49.82	342	NO	YES	NO	NO	YES	NO
MAISSIN	Ne	22	*	6~		5.17	49.95	507	NO	YES	NO	NO	YES	NO
VILLANCE	Ne	23	*	6~		5.22	49.97	644	NO	YES	NO	NO	YES	NO
LIBIN	Ne	24		6~	3~	5.25	49.97	1142	NO	YES	NO	NO	YES	NO
FREUX	Ne	26		6~	3~	5.43	49.97	660	NO	YES	NO	NO	YES	NO
ANLOY	Ne	31		6~	3~	5.22	49.95	368	NO	YES	NO	NO	YES	NO
OCHAMPS	Ne	32	*			5.27	49.92	679	NO	YES	NO	NO	YES	NO
RECOGNE	Ne	33		6~	3~	5.35	49.90	731	NO	YES	NO	NO	YES	NO
JEHONVILLE	Ne	38	*	6~		5.20	49.90	776	NO	YES	NO	NO	YES	NO
SAINT-PIERRE	Ne	39		6~	3~	5.38	49.90	537	NO	YES	NO	NO	YES	NO
OFFAGNE	Ne	43		6~	3~	5.17	49.88	684	NO	YES	NO	NO	YES	NO
BERTRIX	Ne	44		5~, 6~	3~	5.25	49.85	3923	NO	YES	NO	YES	YES	NO
LONGLIER	Ne	47		4~*	3~	5.45	49.85	1183	NO	YES	NO	NO	YES	NO
EBLY	Ne	49		6~	3~	5.53	49.85	524	NO	YES	NO	NO	YES	NO
WITRY	Ne	50	*	6~		5.60	49.85	639	NO	YES	NO	NO	YES	NO
ROCHEHAUT	Ne	51		6~	3~	5.00	49.83	412	NO	YES	NO	NO	YES	NO
AUBY-SUR-SEMOIS	Ne	57		6~	3~	5.17	49.80	313	NO	YES	NO	NO	YES	NO
STRAIMONT	Ne	60		6~	3~	5.37	49.78	477	NO	YES	NO	NO	YES	NO
ASSENOIS	Ne	63		4~	3~	5.47	49.80	1065	NO	YES	NO	NO	YES	NO
BAGIMONT	Ne	65		6, 6~	3~	4.87	49.82	106	NO	YES	NO	NO	YES	NO
CORBION	Ne	69		6~	3~	5.00	49.78	805	NO	YES	NO	NO	YES	NO
ANLIER	Ne	76		4~	1	5.62	49.77	800	NO	YES	NO	NO	YES	NO
MUNO	Vi	2		6~	3~g	5.17	49.72	1156	NO	YES	NO	NO	YES	NO
FLORENVILLE	Vi	6		6	3~	5.30	49.70	1959	YES	YES	NO	NO	YES	NO
CHINY	Vi	8		6	3~	5.33	49.73	692	NO	YES	NO	NO	YES	NO
ROSSIGNOL	Vi	13		6	3~	5.48	49.72	738	NO	YES	NO	NO	YES	NO
HABAY-LA-VIEILLE	Vi	16		4~	3~	5.62	49.72	1979	NO	YES	NO	NO	YES	NO
SAINT-VINCENT	Vi	18		4	3~	5.47	49.67	461	NO	YES	NO	NO	YES	NO
BELLEFONTAINE (TINTIGNY)	Vi	21	*	4	4g	5.48	49.65	839	NO	YES	NO	NO	YES	NO
SAINTE-MARIE-SUR-SEMOIS	Vi	22		4	4g	5.55	49.67	955	NO	YES	NO	NO	YES	NO
VILLERS-DEVANT-ORVAL	Vi	25		6, 6~	3~	5.32	49.62	711	NO	YES	NO	NO	YES	NO
MEIX-DEVANT-VIRTON	Vi	27		6	4g	5.47	49.60	701	NO	YES	NO	NO	YES	NO
VILLERS-LA-LOUE	Vi	32	*			5.48	49.57	524	NO	YES	NO	NO	NO	NO

PLACENAME	ARR.	COMM.	~BASE	ANNU	BA(L)NEU	BENE	BONU	CANE	CINQUE	DENTE	FAME	GAMBA	HOMO	IUNIU	LINEU	LUNIS DIE
ETHE	VI	33	*			4g, 4n		4^n	4^g	6	1e	6~				
CHATILLON	VI	35		6~		3~g	9~	3~g	3~	6	4>	6~	9~	3~<		C~
MEIX-LE-TIGE	VI	36	*		3~	3~	9~	3~g	4g	6	2>	6~				
DAMPICOURT	VI	37		6~	3~	3~		3~	4g	6	1e	6~	9~	3~<	3~	C~
SAINT-MARD	VI	38		6~			9~	3~	4g	6	1e	6~	9~	3~<		3~
TORGNY	VI	43		6~	3~	3~	9~	3~	4g	6	1e	6~	9~	3~<	3~	C~
RUETTE	VI	46		6~	3~	3~	9~	3~	4g	6	1e	6~	9~	3~<		C~
MUSSON	VI	47		6~		3~	9~	3~g	4g	6	1e	6~	9~	3~<		C~

PLACENAME	ARR.	COMM.	~BASE	MANSIONE	NE GENTE	PISC+ONE	POENA	RENE	RUM(I)CE	SEPTIMANA	SIMIU	SINGULARE	UMBRA	UNU	VENA
ETHE	VI	33	*	9~		9~	uon		9~	1e					4n
CHATILLON	VI	35		9~		9^g	9n<	4>	9~	4n	3~	6g	9~	4g	8n<
MEIX-LE-TIGE	VI	36	*	9~		9~	9n<		9~	2n>		6g		4g	4n
DAMPICOURT	VI	37		9~		9~	uon	3~		1e	3~	6g	9~	4g	4n
SAINT-MARD	VI	38		9~		9~	uon			1e	3~	6g	9~	4^g	4n
TORGNY	VI	43		9~		9~	uon		9~	1, 1e	3~	6~g, 6g	9~	4~g	4n
RUETTE	VI	46		9~		9~	uon		9~	1, 1e	3~	6^g	9~	4~g	6n<, 4n
MUSSON	VI	47		9~		8^g			9~	1, 1e	3~	6g	9~	4g	4n

PLACENAME	ARR.	COMM.	~BASE	VENTU	VINU	LONGITUDE	LATITUDE	POPULATION	URBAN	AGRICULTUR	PASTURAGE	INDUSTRY	FORESTRY	TOURISM
ETHE	Vi	33	*			5.57	49.57	0	NO	NO	NO	NO	NO	NO
CHATILLON	Vi	35		6	3~	5.68	49.62	527	NO	YES	NO	NO	YES	NO
MEIX-LE-TIGE	Vi	36	*			5.72	49.62	388	NO	YES	NO	NO	YES	NO
DAMPICOURT	Vi	37		6	3~	5.48	49.55	568	NO	YES	NO	NO	NO	NO
SAINT-MARD	Vi	38		6	3~	5.52	49.55	2260	NO	YES	NO	YES	YES	NO
TORGNY	Vi	43		6	3~	5.47	49.50	301	NO	YES	NO	NO	NO	NO
RUETTE	Vi	46		6	3~	5.58	49.53	720	NO	YES	NO	NO	YES	NO
MUSSON	Vi	47		6	3~	5.70	49.55	1860	NO	YES	NO	YES	YES	NO

Université de Liège

Marie-Guy Boutier

28. 11. 2013

Cher Monsieur,

Voici une copie de l'exemplaire (copie) retrouvé.

Bonnes retrouvailles !

Marie-Guy Boutier

N.B. Les annotations sont celles de N. Rappistella, possesseur de la copie