Persistent traditions: a long-term perspective on communities in the process of Neolithisation in the Lower Rhine Area (5500-2500 cal BC)

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Chapter 3

Thoughts on transition - The Lower Rhine Area

3.1 Introduction

Against the background of the transition to agriculture on a pan-European scale (as presented in the previous chapter), the focus now shifts to the process of Neolithisation in the study region of the LRA. Apart from a discussion of several of the main geographical and archaeological aspects that create a spatio-temporal context for this study, a number of factors distorting our perspective on the archaeological information available as well as the developments in the past will be discussed. Geomorphologically, the LRA constitutes the western part of the North European Plain. To the south it is bordered by the Belgian and German mountain ranges of the Ardennes and the Eifel and to the west and north by the North Sea. The eastern border runs through the German *Bundesländer* Niedersachsen and Rheinland-Westfalen, skimming the German mountain ranges (*Mittelgebirge*) and ending in the North Sea west of Hamburg.

The process of Neolithisation in this region can be characterised as both long-term and complex. It can, however, be conceptually divided into two separate phenomena, both with a distinctly different background yet both intricately interlinked. The first can be seen as the 'classic' Neolithic succession of Danubian origin, involving the first LBK settlers and their successors, arriving in the LRA around 5250 cal BC. Associated, and potentially pre-dating these developments, are groups producing La Hoguette pottery and *Begleitkeramik* (*e.g.* Louwe Kooijmans 2007[a], 295). It is unknown to what extent they should be positioned in a process of Neolithisation. Since these groups are beyond the main scope of this thesis they will only be dealt with cursorily (however, see Vanmontfort *et al.*(eds) 2010[a]).The other phenomenon concerns the development and transition of the local Late Mesolithic hunter-gatherers into farmers, involving the Swifterbant culture and its successors. This process is geographically defined, focusing mainly on the wetlands and wet margins between the Scheldt and Elbe, and can be placed roughly between 5500 and 2500 cal BC. The reader is referred to figs. 3.1-3.6 for a spatiotemporal and geographical background and to Louwe Kooijmans 1998[a]; 2005[a]; 2007[a]; Raemaekers 1999; 2005[a] for a general overview).

3.2 Neolithic successions: a brief overview

The earliest clear evidence for Neolithic communities in the study area (*Vollneolithikum*) comes with the arrival of the Linearbandkeramik culture (LBK), settling mainly on the fertile patches of loess at the southern and eastern margins.[1] The LBK entered the LRA during its second phase of spread, termed

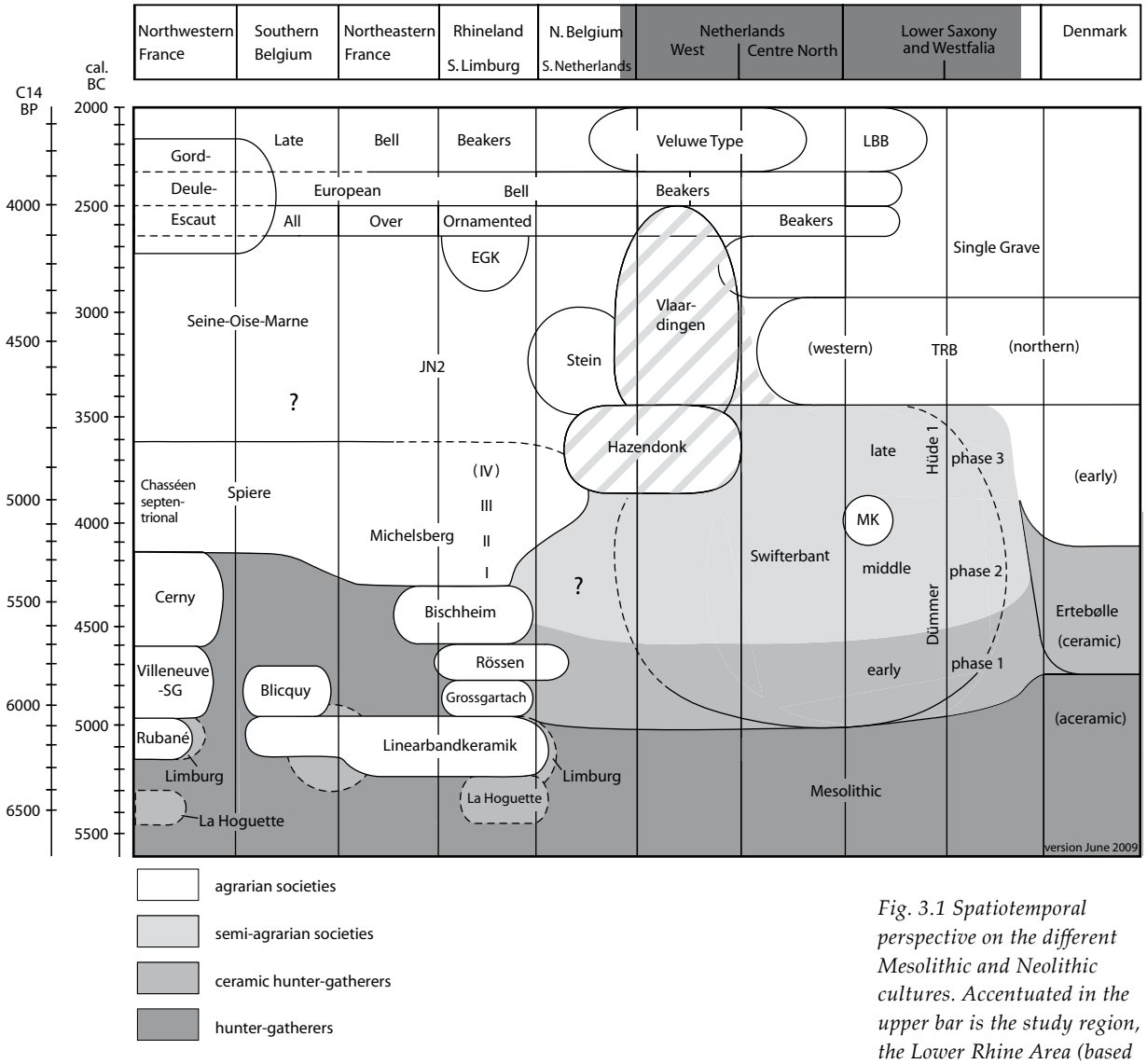


Fig. 3.1 Spatiotemporal perspective on the different Mesolithic and Neolithic cultures. Accentuated in the upper bar is the study region, the Lower Rhine Area (based on Louwe Kooijmans 2007[a], fig. 2, version June 2009).

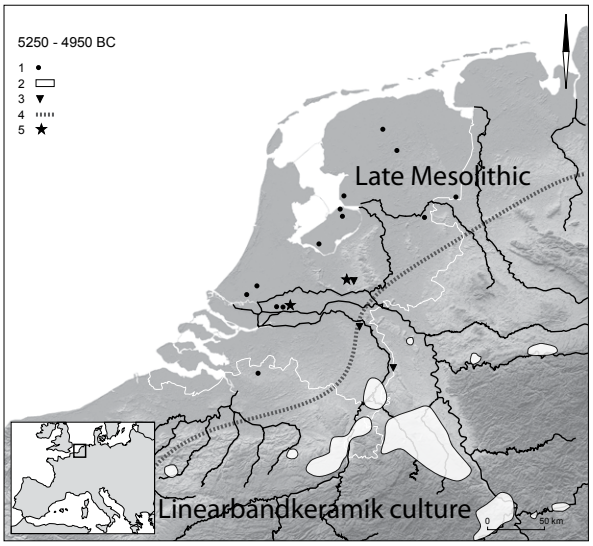
Flomborn (see Gronenborn 2007; Louwe Kooijmans 2007[a]) and usually dated around 5300 cal BC (Modderman 1970, phase 1b).[2] Its main areas of settlement or *Siedlungskammer* can be pinpointed to the German Aldenhovener Platte, the Dutch Graetheideplateau, and the adjacent Belgian loess area (see Bakels 1982; Kuper *et al.* 1977; Lüning 1982[a]; 2000; Modderman 1985). Some smaller locations appear further west in Belgium (*e.g.* Hainaut; Van Berg and Hauzeur 2001).

By 4900 cal BC, the rather uniform tradition of the LBK is largely continued in the east of the study area in the subsequent Rössen culture (4900-4300 cal BC), preceded by the Grossgartach-horizon. Most settlements are known from the German *Niederrheinische Bucht* and, until now, apart from some isolated finds, the site of Maastricht-Randwijck (Louwe Kooijmans 1988; Oude Rengerink 1991) forms the only Dutch counterpart. Although clearly the Danubian 'inheritors' of the LBK (Constantin 1985, 326; Jeunesse 1998; Lüning 1982[b]), there are some important differences. The Rössen settlement system appears to be more flexible, abandoning the strict adherence to the loess. Settlements are now also located in less fertile areas. They tend to be less numerous and more nucleated and

short-lived, featuring trapezoidal multi-family buildings and palisading (Dohrn-Ihmig 1983; Lüning 1982[b]). Bread wheat and barley are both new cultivated wheats (Bakels 1990, 83-87) and wild and domestic animals were consumed in differing proportions (Raemaekers 1999, 140). Also, new flint sources are acquired. Exemplary of the intensified northern and western contacts with the Late Mesolithic and Swifterbant communities is the spread of the Rössen *Breitkeile* and (occasionally some) pottery over an extensive area (see Louwe Kooijmans 1998[a]; Lüning 1982[b]; Sherratt 1990; Verhart 2000, fig. 5.1; Van der Waals 1972). Further west, the LBK is succeeded by the Blicquy Group, concentrated in the LBK territories in Hainault and western Hesbaye.[3] The group can be defined as a regional variety of the Groupe Villeneuve-Saint-Germain (*e.g.* Constantin/Illett 1998) that originated out of the latest LBK phases in the Paris Basin (*RRBP, Rubané récent du Bassin Parisien*). Its material repertoire is therefore clearly derived from the LBK. Its temporal affiliations are subject of a heated debate concerning the contemporaneity of the latest Bandkeramik phases with the Blicquy Group in Belgium. Since the resolution of the available ^{14}C dates is inadequate, arguments are based on stylistic disparities, (non-)association of finds and possible re-use of material (Caspar/Burnez-Lanotte 1998). Some authors such as Constantin (1985, 325; Constantin/Illett 1998) argue for a diachronic relation based on the apparent lack of sufficient contact finds. Others, such as Jadin (2003, 479-486) are convinced of the coexistence of both, whether aware or unaware of each other, even proposing the 'scavenging' of each other's sites.

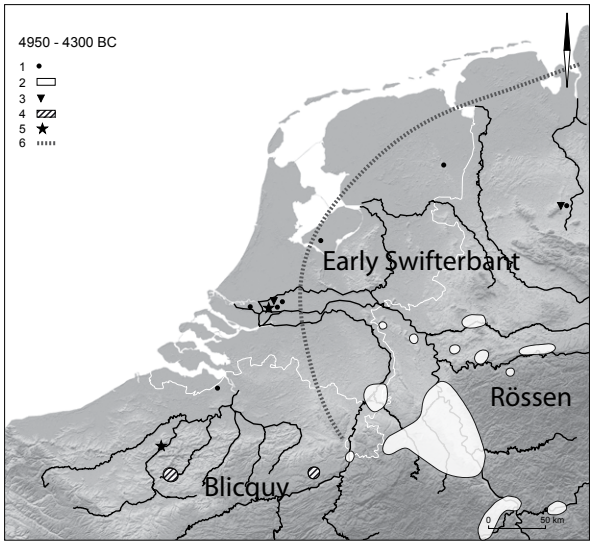
Both cultures in the research area are succeeded by the Michelsberg culture around 4300 cal BC.[4] (Louwe Kooijmans 1998[a], 412; Vanmontfort 2004, 299-300). The Michelsberg culture (MK) has a very distinctive 'cultural repertoire' as attested by deep shaft mining, almost industrial characteristics of flint production, the construction of *Erdwerke* and the resemblances in pottery morphology (*e.g.* De Grooth 1994; Louwe Kooijmans 2005[a]; Whittle 1999, 203). However, despite its uniform appearance there is also clear evidence for regional variation, for example regarding pottery production and lithic technology. This may reflect former cultural traditions as well as chronological, geographical and economic variation (Louwe Kooijmans 2005[a], 253, 256; Vanmontfort 2004, 323). The MK settlement system remains elusive, as only few house plans have been uncovered (see Bakels 2009). Apart from taphonomical considerations this might be explained by a less robust architecture or possibly a higher degree of mobility (Schreurs 1992, 163; Vanmontfort 2004, 329; Verhart 2000, 218-221). In Limburg and adjacent Belgium the MK also settles on the less fertile sandy or loessic sandy soils and the Northwest group turns up as far north as the Münster basin and the riverine area in the north (Louwe Kooijmans 2005[a], 258; Lüning 1968; Vanmontfort 2004). Although the palimpsest character of many settlements is not very informative the apparent shifts in settlement location attest to an important adaptation of the agricultural system. This may relate to more emphasis on husbandry, but also to the appearance of new crops such as Durum wheat (see Bakels 2003; Louwe Kooijmans 2005[a], 260).

Around 3400 cal BC, the northern and eastern parts of the research area witness the inception of the Neolithic TRB West Group (Van Gijn/Bakker 2005). Its origins may partially lie within the indigenous Swifterbant communities (see Ten Anscher 2012). It represents the western regional variant of the Funnel Beaker complex covering a large part of the North European Plain and Southern



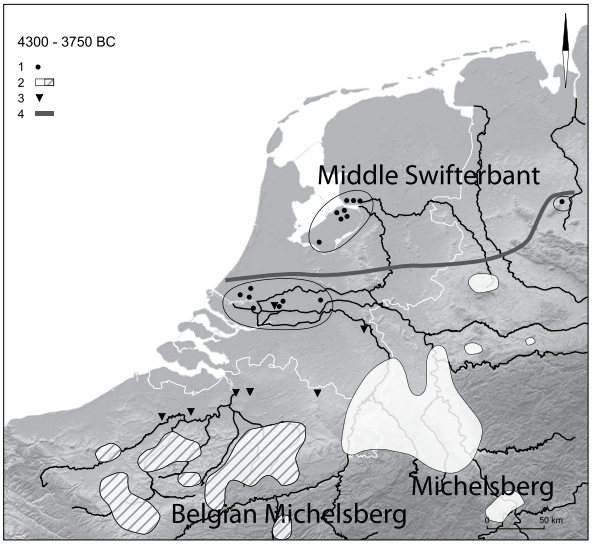
1. Late Mesolithic sites with a ^{14}C range overlapping with this phase
2. LBK settlement areas
3. non-Swifterbant pottery (*Begleitkeramik/La Hoguette*)
4. northern limited distribution isolated LBK adzes
5. earliest Swifterbant pottery

Fig. 3.2



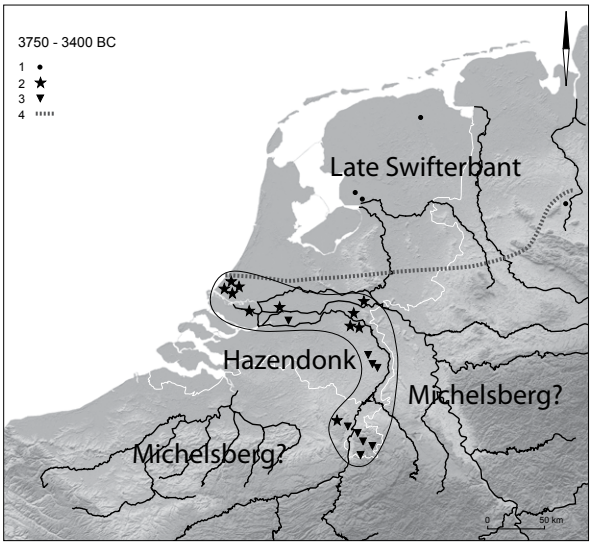
1. Early Swifterbant sites
2. Rössen settlement area
3. Rössen pottery
4. Blicquy settlement area
5. Blicquy pottery
6. northwestern distribution limit of Rössen *Breitkeile*

Fig. 3.3



1. Middle Swifterbant sites
2. Michelsberg settlement area
3. Michelsberg pottery
4. northern distribution of mined lithic artefacts

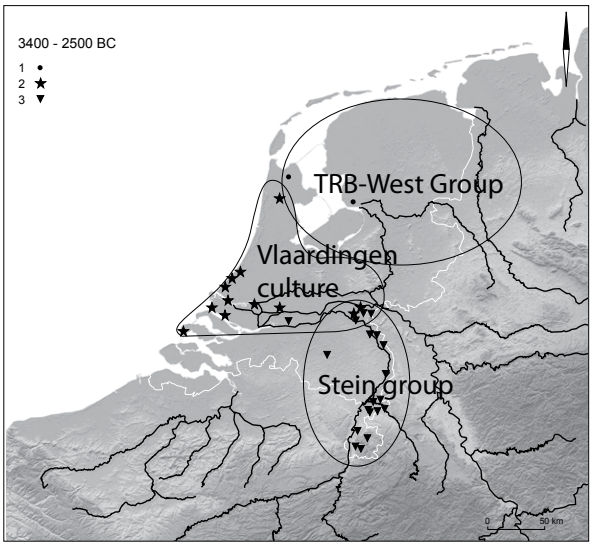
Fig. 3.4



1. Late Swifterbant sites
2. Hazendonk sites
3. Hazendonk(-like) pottery sherds
4. northern distribution of mined lithic artefacts

Fig. 3.5

Scandinavia (Midgley 1992; 2008). Well known for its megalithic burial monuments, the *hunebedden*, the domestic aspects of the TRB West Group are less well-known. It is probable that some form of shifting cultivation agriculture was practised (Van Gijn/Bakker 2005, 288). House plans, such as the one from Slootdorp-Bouwlust (Hogestijn/Drenth 2000/2001, 44-55) and several German examples, indicate rather small, two-aisled, rectangular structures (Van Gijn/Bakker 2005, 287; Midgley 1992). Bakker (1992) argues that this period also sees the introduction of the ard and wheeled transport.



1. TRB West Group wetland sites
2. Vlaardingen sites
3. Stein sites

Fig. 3.6

Figs. 3.2-3.6 Cultures and contact finds c. 5500-2500 cal BC. (Adapted from Out 2009, fig. 1.2-1.4; based on data from the research project 'From Hardinxveld to Noordhoorn' and a map by W. Laan, Archol).

In the south the MK is succeeded by the Stein Group (*cf.* Louwe Kooijmans/ Verhart 1990). Apart from the chambered tomb discovered near Stein (South Limburg; Modderman 1964) the material legacy of the Stein Group is mostly known from a few pits as found at Linden-Kraaijenberg (Louwe Kooijmans/ Verhart 1990), Sittard-Hof van Limburg and Ittervoort (Drenth *et al.* 2003) as well as surface sites. Recently very long (up to 30 m) rectangular house plans have been documented near Veldhoven (Van Kampen/Van den Brink in prep./2013). Culturally the Stein Group belongs to the Wartberg-Stein-Vlaardingen complex (WSV), which finds itself in-between the TRB West Group in the north and the Seine-Oise-Marne complex (SOM) further south (see Louwe Kooijmans 1976[a,b]; Louwe Kooijmans/Verhart 1990).

From 2900 cal BC onwards (Lanting/Van der Plicht 1999/2000, 35), both the TRB culture and the WSV complex merge into the Single Grave Culture. This Late Neolithic cultural complex, encompassing the later All Over Ornamented phase and the subsequent Bell Beaker pottery tradition, bridges the gap to the Early Bronze Age. In many ways the Single Grave Culture can be seen as a pan-European phenomenon (Van Gijn /Bakker 2005, 305), forming a cultural break with the past.

3.3 On the fringe…

The description above does not do justice to the complexity and variability of the Neolithic cultures involved or the mechanisms and details of their succession and relations. Yet generally the development and chronological outline of these cultures is understood. What is also accepted is their economic status and character: apart from several exceptions or regional adaptations the subsistence mode was essentially agricultural. This means that they can be seen as the main influence on or source of the second phenomenon, the transition of originally hunter-gatherer societies into farmers.

In the following an overview shall be given of the developments in the wetlands and wet margins of the LRA, since these communities, often pictured as being 'on the receiving end' form the main focus of this thesis. Apart from providing a general background, the different elements presented below form a framework for the study of the specific character and nature of the transition to agriculture in the LRA, presented in Chapters 5-9.

3.3.1 Cultural developments

Sites of the Swifterbant Culture, the Hazendonk group and the Vlaardingen culture, communities combining both a farming and a hunter-gatherer existence, are mainly known from the Holocene sedimentation basin, although they are geographically not absolutely restricted to this wetland area. This basin is situated to the west and north of the loess and sandy Pleistocene uplands where most of the sites of the above-mentioned Neolithic cultures can be found (*cf.* Louwe Kooijmans 1998[a], 421). Late Mesolithic sites (see Chapter 5) have been documented in a wider area, but distinct wetland sites that are the direct fore-runners of the sites of the Swifterbant communities have been found in these wetland areas (*e.g.* Louwe Kooijmans 2003; Peeters 2007).

These societies only gradually adopted elements of the Neolithic package from the subsequent cultures on the uplands. Louwe Kooijmans (1993[b], 131) introduced the term 'extended broad spectrum' to define their mode of subsistence consisting of a (continued) Mesolithic economy, combined with aspects of animal husbandry and crop cultivation (also see Chapter 7) Of these intermediate societies, the Swifterbant culture can be roughly dated between 5000 and 3400 cal BC (Louwe Kooijmans 2003; Raemaekers 1999, 108-112). It distinguishes itself from previous and contemporary Late Mesolithic communities by the use of pottery and later on by the piecemeal introduction and use of domesticates (Louwe Kooijmans 2001[b], 523; 2007[a]) and between *c.* 4300 and 4100 cal BC possible crop cultivation (Out 2009, 444-445). The presence of small-scale cultivation has recently been further attested by the find of what may be small fields at Swifterbant-S4 (Huisman/ Raemaekers 2008; Huisman *et al.* 2009). The Hazendonk Group emerges out of the southern Swifterbant communities around 3700 cal BC. There are indications in material culture for both an origin in the Swifterbant culture as well as distinct affiliations with the Michelsberg Northwest Group (Louwe Kooijmans, 2006[d], 150-155; 2009; Raemaekers 1999, 156-157). Apart from convincing indications for animal husbandry as well as crop cultivation at several sites (Louwe Kooijmans 2007[a]; 2005[a]), there is also clear evidence for the construction of houses as attested at Wateringen IV (Raemaekers *et al.* 1997, 146-149). The excavations at Schipluiden have yielded evidence for the first sedentary occupation, based on evidence relating to subsistence, seasonality and settlement structure (Louwe Kooijmans 2006[a]). At Ypenburg the (organic) evidence is less convincing, but a sedentary occupation is the most likely option (see Koot *et al.* 2008). From about 3400 cal BC the relatively short cultural phenomenon of the Hazendonk group evolves into the Vlaardingen culture or Vlaardingen group (Raemaekers 1999, 178; Verhart 2010[a]). In the north the relationship and transition between the last Swifterbant communities and the West group of the TRB remains poorly understood (see, however, Ten Anscher 2012). The Vlaardingen group left some convincing evidence of house construction, (*e.g.* Verhart 1992), but other sites

yield a much more diffuse picture (Hogestijn/Drenth 2000; also see Chapters 7 and 8). Furthermore, there is a remarkable variation in both geographical location choice as well as subsistence mode, incorporating, for instance, locations with ard marks as well as sites with a relatively significant contribution of wild resources (Amkreutz 2010[b]; Van Gijn/Bakker 2005, 10-12). Culturally related to the Stein Group, both end with the dominance of the Beaker cultures around 2500 cal BC. These appear with the onset the Single Grave Culture around 2850 cal BC (Lanting/Van der Plicht 1999/2000, 35).

3.3.2 Material developments and contact

The Neolithisation process of the Delta communities studied here is geographically and chronologically 'flanked' by developments taking place in adjacent Neolithic communities. From 5300 cal BC onwards the LBK and subsequent Neolithic groups such as the Rössen and Michelsberg culture can be found to the south and east, while later on the north and the northeast saw the development of the TRB Neolithic and the Single Grave Culture (SGC). It is evident that these groups over time formed the major source of inspiration, either through direct contact and exchange, or through the transmission of ideas, for the Neolithic developments in the wetlands and wet margins. The most characteristic steps will be briefly discussed below. A more elaborate discussion may be found in Chapter 7.

Contacts in stone

A first step involves evidence of contact between the Danubian Neolithic and Late Mesolithic or Swifterbant communities further north and west. This is best demonstrated by the dispersal of Bandkeramik adzes and, later on, the even wider distribution of Rössen *Breitkeile*. Although the exact interpretation of these finds is hampered by various difficulties (Amkreutz *et al.* 2009), it is most likely that their occurrence is the result of exchange between foragers and farmers (see Verhart 2000; 2012; Raemaekers *et al.* 2011).[5] Due to the absence of contextual information it is difficult to date this exchange and interaction, but it is likely that it continued well into the 5th millennium cal BC. Next to *Breitkeile* southern contacts are also reflected in the presence of raw materials such as Rijckholt flint or flint of Lightgrey Belgian type. Specifically compelling and early were the finds of at least one LBK point made from a blade of Rijckholt flint and a pre-core of Rijckholt flint at the site of Hardinxveld-Giessendam Polderweg (Louwe Kooijmans 2003).

Contacts in ceramics

The first evidence of local indigenous pottery production, marking the start of the Swifterbant culture, has been documented for the last phase of occupation at Hardinxveld-Giessendam Polderweg and dates around 5000 cal BC (*ibid.*; Louwe Kooijmans 2011; Raemaekers 2011, 452).[6] Other early Swifterbant pottery was found at Hoge Vaart-A27, Bronneger and Hüde I (see Appendix I). The earliest SWB pottery predates the Ertebølle ceramics by some 300 years. Comparable early pottery has been found in the German Baltic area, most notably at Schlamersdorf. This pottery was ^{14}C dated to *c.* 5300 cal BC, but this date is probably a couple of hundred years too old due to the reservoir effect (Hartz *et al.* 2002, 330). This and, for example, the absence of lamps, eliminates the Ertebølle culture as

a source for the origins of Swifterbant pottery (see Raemaekers 1997; 2011), yet does not provide further evidence for its inspiration or development.[7] In general two theories are presented. The first of these interprets the Swifterbant and Ertebølle pottery as (partially) belonging to a broader and widespread tradition of point-based pottery stretching across the whole of the Northern European plain and into the lake areas of northern Poland and Russia (*e.g.* Crombé 2009; Ilkiewicz 1989; Van Hoof 2005; Raemaekers/De Roever 2010; De Roever 2004; Timofeev 1998). This interpretation specifically stresses the cultural contact between indigenous groups of hunter-gatherers and the transmission of knowledge of pottery production between these groups (see Louwe Kooijmans 1998[a], fig. 5). The other theory argues that the origins of the indigenous pottery are to be found in the Danubian Neolithic (Crombé *et al.* 2011[a]; Louwe Kooijmans 2010[a]; 2011). While certain authors have attempted to pinpoint a source ranging from La Hoguette and the LBK to the Rössen culture (see Hogestijn/Peeters 1996; Ten Anscher 2012; Raemaekers 1999, 141; De Roever 2004, 151-152) this remains difficult to ascertain with any certainty. Recently a plausible hypothesis has been forwarded that separates execution from inspiration. It is argued here that while the southern (LBK) sphere is likely to have formed a source of inspiration for the origins of Swifterbant pottery, the execution is distinctly local. For instance, the coiling technique used in some ways resembles the manner in which baskets were woven (*e.g.* Louwe Kooijmans 2010[a]; Raemaekers/De Roever 2010). Louwe Kooijmans (2010[a]) argues that it was probably the men within hunter-gatherer communities that became acquainted with these new techniques and materials on their expeditions. Despite these arguments the actual rationale behind the question *why* communities started producing pottery, its effects and the changes it brought about, unfortunately remains poorly understood (however, see Barnett 2009; Budja 2009), but most likely (also) relates to new consumption methods.

3.3.3 Introducing domesticates and cultigens

Another hallmark of the process of Neolithisation is the introduction of domestic animals. The first bones of domesticated animals in Swifterbant context have been documented for phase 3 at Hardinxveld-Giessendam De Bruin. They date between 4700 and 4450 cal BC and comprise cattle, pig, sheep and goat (Louwe Kooijmans 2003; 2007[a], 297). Further north, in Schleswig-Holstein, a limited number of bones of cattle were also dated to *c.* 4600 cal BC at the site of Rosenhof (Hartz *et al.* 2002, 327; 2007), but their context and date are questionable (Noe-Nygaard 2005). It should be noted that the first appearance of domesticated animals does not necessarily imply a drastic economic change. Based on the information available the number of bones of domestic animals in the earliest phase of the Swifterbant culture appears to be rather limited, as is demonstrated at Hardinxveld-De Bruin (Louwe Kooijmans 2007[a]), or even absent, as at Hoge Vaart (see Appendix I). At many later Swifterbant sites the economical contribution of livestock distinctly forms part of a wider choice (*e.g.* Louwe Kooijmans 2007[a]; Zeiler 1997). Domesticated animals seem rather to contribute to what has been termed an 'extended broad spectrum economy' (Louwe Kooijmans 1993[a]; 1998[a]), whereby domesticates (next to crops) are one of many food sources exploited.

Only in the subsequent Hazendonk and Vlaardingen groups do domestic animals, especially cattle, form a more prominent contribution to the faunal spectrum at certain sites (*e.g.* Schipluiden, Louwe Kooijmans 2006[a,b]).

The earliest indications for cereal consumption and potential cultivation are found in the middle phase of the Swifterbant culture between *c.*4300 and 4100 cal BC (Out 2009; Raemaekers 1999).[8] At Swifterbant-S3 grains and chaff of naked barley and emmer were found, while a substantial concentration or dump of charred cereals, chaff and internodes was found in Hazendonk phase 1 (Louwe Kooijmans 1987, 232). These finds can be dated between 4300 and 4000 cal BC. Over the years much discussion has focused on the question of whether or not the presence of these cereals is indeed an indication for local crop cultivation or whether they were either obtained through exchange with fully Neolithic (Michelsberg) farmers further south and east, or grown by the Swifterbant communities themselves on the surrounding uplands and brought to the site seasonally. This especially raised the question of the feasibility of crop cultivation on the dunes and levees in the wetland parts of the LRA (*e.g.* Bakels 1986; 1988; 2000; Louwe Kooijmans 1993[a]; Out 2009; Raemaekers 1999; Weijdema *et al.* 2011). Both import and local production remain viable options (see Out 2009, Chapter 11) based on both older data as well as recent excavations (*e.g.* Huisman/Raemaekers 2008; Huisman *et al.* 2009). This will be discussed in more detail in Chapters 7 and 8. It is, however, safe to assume that crop cultivation as well as animal husbandry at many sites in the study area formed part of this extended broad spectrum of choices, instead of becoming the staple resource for these communities.

3.3.4 Settling down?

In relation to stock herding and crop farming, sedentism has often been seen as a further indication for a Neolithic existence. An important argument is formed by the evidence on seasonality. Unfortunately this evidence is strongly influenced by taphonomical conditions (see Chapter 4), limiting the number of sites with sufficient seasonal information. This topic will be further discussed in Chapter 7. At many sites most evidence indicates an occupation during part of the year, probably with occasional short-term visits during other seasons. The first convincing seasonal evidence for year-round occupation dates to the Hazendonk group at the site of Schipluiden (Louwe Kooijmans 2006[a], 486). Sedentism at this location was supported by other arguments, most notably the continued construction and maintenance of houses and a rather fixed settlement layout with yards (*ibid.*). While it was not possible to identify individual house plans, this did prove possible at the contemporaneous sites of Wateringen IV (Raemaekers *et al.* 1997) and Ypenburg (Koot *et al.* 2008). Unfortunately further evidence for sedentism remains limited, and little is known from contemporaneous Neolithic groups. At later sites such as the TRB site of Slootdorp-Bouwlust (Hogestijn/Drenth 2000/2001) and the Vlaardingen site of Hekelingen III there is, however, evidence for a continued seasonal exploitation of certain locations.

3.4 Factors of perception

The discovery several decades ago of communities with Neolithic elements in a dynamic and unstable environment away from 'safe' Pleistocene uplands or coastal dunes was quite unexpected (*cf.* Louwe Kooijmans 1997, 11; 1999, 113).

Since then a number of excavations, site reports and synthetic overviews have expanded our knowledge, both of these communities and of their way of life as well as their position and role in shaping the process of Neolithisation within the LRA (*e.g.* Glasbergen *et al.* 1961; Kampffmeyer 1991, Louwe Kooijmans 1993[a,b], 1998[a,b]; 2009; Raemaekers 1999; De Roever 2004). The apparent cultural and geographical disparity of the above-mentioned phenomena can, in the light of the long time span involved, be considered as an ideal set of conditions for studying the transition to agriculture. Although we are not dealing with isolated developments the process of Neolithisation can, as it were, be studied in slow-motion here, focusing on elements of contact, adoption and integration. This makes the LRA a meaningful and very valuable region for research.

The brief characterization sketched in this chapter provides a general framework for most characteristic developments within the process of Neolithisation in the LRA, both regarding the fully Neolithic communities as well as the groups situated in the wetlands and their margins that are of the most interest of this study. In general and summarizing, it can be stated that there is a very gradual adoption of pottery (production) initially, and then domesticates and cultigens, into Late Mesolithic and subsequent Swifterbant communities. Most of the material and stylistic evidence points to interaction with Neolithic communities in the south. By the time of the Hazendonk group most elements of a farming economy, including sedentism, were present, although a considerable variation between sites remains (Amkreutz 2010[b]; Louwe Kooijmans/Verbruggen 2011). The Vlaardingen culture forms a final stage in this development, yet remains characterized by diversity.

While such a general outline may be given, it should be noted that much still remains unresolved concerning the exact temporality and character of the individual developments. This thesis mainly aims to contribute to this problem by furthering our understanding of the transition from the perspective and disposition of the indigenous communities involved in the Late Mesolithic to Vlaardingen culture sequence. In order to do so, however, a number of complicating factors should be defined that impair our understanding of these communities, our analysis of their economic adaptations, settlement system and social structure as well as our interpretation of these and other aspects in terms of a transition towards an agricultural way of life.

3.4.1 Bias I: the upland-wetland dichotomy

'At any rate the wetland-upland distinction is ours, based on our geological erudition, separating the Holocene from the Pleistocene geology' (Louwe Kooijmans 1999, 111). The first bias is of an essentially physical nature, although its appreciation and interpretation are less unequivocal. The amelioration of the climate at the transition from the Pleistocene to the Holocene (*c.* 8800 cal BC) led to the melting of the ice caps and a rise in sea-level.[9] This had rather drastic consequences for the subsequent geological development of large parts of the LRA, dictating the distribution of wet and dry land, natural resources and inhabitable places, but also for archaeological insight. The transgression of the North Sea and the related rise of the groundwater table further inland mainly affected the lower lying areas such as the central river district, the IJsselmeer Basin and the northern parts of the provinces of Friesland and Groningen. These areas functioned as sedimentation basins under the influence of both the sea and hinterland river systems (De

Mulder *et al.* 2003, 16; Zagwijn 1986, 27). A range of typical coastal and fluvial wetland landscapes came into existence that were buried or removed again as the influence of the sea expanded, shifting the entire system further west (Berendsen 2005(1997), 153-180; Louwe Kooijmans 1985, 25-28). These gradients became more or less transfixed as sea levels decreased at the onset of the Subboreal (*c.* 4050 cal BC; Gehasse 1995, 194). The stabilization of the coastal belt enabled the growth of saltmarshes and peat over what were previously tidal flats and the influence of fresh water (fluvial or through precipitation) caused desalination of the soil. Further inland, separated by a zone of estuarine creek systems, lake and peat formation was followed by that of both extensive oligotrophic and eutrophic fens interspersed with riverine sediments (*e.g.* Gehasse 1995, 194; Van Gijn/Louwe Kooijmans 2005[a], 208; De Mulder *et al.* 2003, 223-230). These processes contrast with the Holocene impact on the uplands, both on the loess and on the coversand. Apart from local peat growth, erosion or local fluvial and colluvial processes, these areas remained relatively unaltered.

The dichotomy between the upland and wetland has led to biases on several levels. The first level is taphonomical. The different geological background has led to a marked difference in preservation. Quantitatively, sites in the wetlands are far less numerous. The main reason for this is that thick layers of sediment covered them, preventing easy discovery and making excavation a rare and costly exercise. Besides, many former outlying coastal areas were lost during the transgression of the sea until *c.* 4000 cal BC (see De Mulder *et al.* 2003, 223-224).[10] On the Pleistocene upland, sites are often still located on or at the surface and can be discovered by survey. Qualitatively, however, the few wetland sites yield a wealth of unique information. Usually the organic preservation of perishable objects or the palaeoecological potential as reflected in faunal and botanical remains are stressed in this respect (*e.g.* Coles/Coles 1989). Of equal importance, however, is the preservation of distinct spatial patterning and chronological resolution through sedimentation. Stratigraphy and microstratigraphy enables the discovery and localization of episodes or phases of habitation and site-use (Louwe Kooijmans 1997; 1999). This contrasts dramatically with most upland sites. Non-carbonized organic remains often are not preserved due to the natural acidity of the soil (*e.g.* Bakels 2005; Bakels/Zeiler 2005, 311; Price 1978, 81; Verhart 2000, 47, Vermeersch 1989, 284-286). Apart from this the stability of the surface minimalized spatial as well as chronological information while re-use and site-formative processes completed the development of palimpsests (see Chapter 4). This unbalanced distribution of archaeological data quite evidently raises the question of representativeness.

On the dynamic level of past societies the same distinction is of importance. Clearly there are differences between wetland and upland environments concerning the distribution and quantity of resources, inhabitable places or availability of farmland, but the important question here is whether this is a difference of kind, or degree. Were the different wetland landscapes part of a broad range of used environments, or did they represent something different, requiring certain skills or adaptations? Did communities specifically focus on their exploitation or always as part of 'something else'? How wet were the uplands in comparison (Bakels/Zeiler 2005; Louwe Kooijmans 1986; 1997)? The answer to these questions and the interpretation of the wetland environments is not only complicated by the above-mentioned taphonomic bias, but also by our own etic bias. Many wetlands are still

perceived as wastelands, marginal areas, unsuitable for year-round occupation, let alone agriculture. This perception need not have been analogous with the prehistoric perception (*ibid.*), which dictates that we try to answer the question of representativeness principally on the basis of our archaeological data-set, however unbalanced it may be. These topics will be touched upon in Chapters 4 and 7-8.

3.4.2 Bias II: the Scandinavian paragon

The second bias is of a more historical nature, but is related to that described above. For a long time the supposed limited potential of our archaeological record forced researchers to look abroad for parallels. Price (2003, 274), reflecting on his career stated: *'My research here* [the Netherlands] *solidified my interest in the Mesolithic but, at the same time, made me aware that better preservation was essential for understanding prehistoric hunter-gatherers*.' For the Late Mesolithic in general and the Early and Middle Neolithic on the Northwestern fringe this often meant a comparison with high-quality South-Scandinavian sites (see Louwe Kooijmans 2001[a]; 2005[b]). Post-war research mainly focused on typological and typo-chronological aspects (*e.g.* Bohmers/Wouters 1956) and the association with either northern (Maglemose/Kongemose) or western (Sauveterre/Tardenoisien) traditions. For the end of the Late Mesolithic Newell distinguished the De Leien-Wartena complex, also related to the Nordic traditions (Newell 1973, 407). Later on parallels for other aspects such as subsistence, housing, burial customs and settlement system were often found in Denmark or Southern Sweden (*e.g.* Gehasse 1995, 211-216; Hamburg/Louwe Kooijmans 2001, 97; Newell 1973, 410-415; Smits/Louwe Kooijmans 2001, 431-432; Verhart 2000, 123). Apart from these parallels, the Swifterbant culture, specifically, is often linked more directly to the Danish Ertebølle culture because of (supposed) material similarities, especially in the pottery (De Roever 1979; 2004). This sometimes led to the assumption that Swifterbant was a southwestern variant of Ertebølle. Thorpe (1996, 55): '*We should not, however, underestimate the importance of the links visible at the Swifterbant sites with gatherer-hunter practices to the north in the pottery…*' Another example is Thomas (1996[a], 316): '*An interconnected group of later Mesolithic communities on the North European Plain, of which the Ertebølle are merely the most archaeologically visible…*' (*e.g.* Zvelebil and Rowley-Conwy 1986). Stapel (1991) and especially Raemaekers (1997) have recognized and commented on this problem. Raemaekers clearly states that the similarities between both cultures are mainly restricted to the occasional occurrence of point-based pottery in Swifterbant context, arguing for a rather divergent character of both groups (1997, 229).

Another result of the more informative Scandinavian data-base is the fact that certain models used to describe and explain the transition to agriculture in Northwestern Europe are based upon Scandinavian evidence or research. The most influential is without a doubt the 'availability model' designed by Zvelebil and Rowley-Conwy in 1984. This descriptive model has been mentioned and used in many studies on the transition to farming in the LRA (*e.g.* Van Gijn/Louwe Kooijmans 2005[b]; Gehasse 1995; Out 2009; Raemaekers 1999; Louwe Kooijmans 1998[a,b]; Louwe Kooijmans 2001[a,b], Vanmontfort 2004). The 'availability model' in general describes three phases within the transition to agriculture (see fig. 3.7). The first phase, or the 'availability phase', is marked by some exchange of materials or information between foragers and farmers, but domesticates and cultigens do not

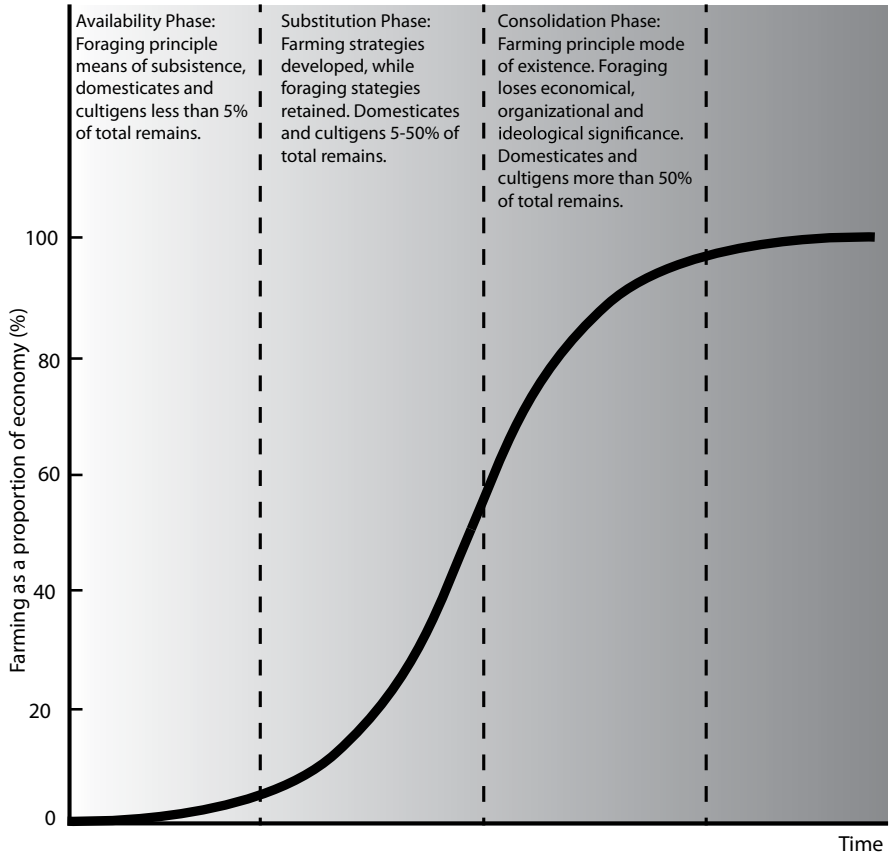


Fig. 3.7 The availability model (adapted from Zvelebil 1986[a]; 1998[a]).

make up more than 5% of the total remains within the assemblages of the hunter-gatherer economies. Both remain culturally and economically independent. In the subsequent substitution phase there is some form of competition between the farming and foraging way of life, which is eventually responsible for an increasing decline of the latter. Domesticates and cultigens make up 5-50% in this transitional phase. The process ends with the consolidation phase when cultigens and domesticates make up more than 50%. Farming is the principal mode of subsistence (Zvelebil/Rowley-Conwy 1984; Zvelebil 1986[a,b]). Although the model cannot be denied a certain elegance, it was originally conceived with reference to the Scandinavian situation. This is most markedly demonstrated by the substitution phase, which is presumed to have been short, mainly because of the difficulties in maintaining a subsistence strategy comprising both a considerable amount of hunting and gathering as well as farming (Zvelebil/Rowley-Conwy 1984, 112; Zvelebil 1996, 326; 1998[a], 11). This seems to be inspired by the rather abrupt shift to agriculture marking the start of the Neolithic in both Scandinavia and Great Britain around 4000 cal BC. Louwe Kooijmans (1998[a], 422-425) and Raemaekers (1999, 187) have therefore both questioned the applicability of the model for the LRA, arguing that the region, by contrast, experienced a rather long substitution phase (also see Chapter 7 as well as Pluciennik 1998, 68; Thomas 1988). Associated with this is the detailed analysis of the transition to agriculture and forager-farmer interactions in the circum-Baltic region (Zvelebil 1996; 1998[a]), which seems quite unrealistic for the LRA.

Using Scandinavian data to patch up the deficiencies of the archaeological record of the LRA and elsewhere (*e.g.* Armit/Finlayson 1992, 665) is not an erroneous practice in itself. In the LRA there are more or less evident cultural similarities on several levels (Louwe Kooijmans 2003, 621). Most Scandinavian data, however, stems from either the Boreal Maglemose culture or the later Ertebølle culture (Louwe Kooijmans 2001[a], 464). The intermittent Kongemose culture, ending around 5400 cal BC, currently is far less informative, thus providing a skewed parallel case-study. Another danger lies in the recurring association of the Scandinavian Late Mesolithic with the concept of complexity (*e.g.* Zvelebil 1996, 1998[a]) and the applicability of this to the situation in the LRA. Complex hunter-gatherers are often associated with certain traits setting them apart from other foragers.[11] Price and Brown (1985, 10-12) name: intensification of production, technological innovations, specialization, reduction in mobility, increased territoriality, extensive and differentiated settlements, complex burial traditions, storage etc. (*cf.* Testart 1982). Elements of these characteristics of complex hunter-gatherers can be found in the archaeological record of the Late Mesolithic communities of Southern Scandinavia (*e.g.* Andersen 1994; 2004; Grøn 1987; Larsson 1990; Müller *et al.* 2002 (1900)). This does not justify their applicability to the situation in the LRA (*e.g.* Verhart 2003), yet some aspects of complexity, such as an increasing population density, smaller territories, more sedentism and associated cemeteries have also been suggested for the Late Mesolithic of this region (*e.g.* Deeben/Van Gijn 2005, 192-197; Neeley/Clark 1990; Newell 1970[a,b]).

The problem of using the notion of complexity will also be touched upon in Chapter 5. Here it suffices to mention that complex hunter-gatherers are often seen as the apogee of foraging communities, suggesting the existence of a logical evolutionary development from simple to complex (Hodder 1990, Price/Brown 1985). This often leads to the assumption that these communities were the ones predisposed to agriculture, exhibiting a higher degree of sedentism, social stratification etc. (*ibid.*; Bogucki 1999; Price 1996). The concept of complex hunter-gatherers as well as its neo-evolutionist connotations have received criticism mainly because of many of these associated assumptions (Rowley-Conwy 1998; 2001). Despite it remaining a contentious term, it generates many questions regarding site-function, settlement system and social structure, rendering it a valuable concept for testing, also in the LRA. Both the concept of complex hunter-gatherers as well as the use of Scandinavian parallels may therefore aid in our understanding of the transition to agriculture, but their use should be conditional in order to avoid careless extrapolation (also see Armit/Finlayson 1992, 665). Research should primarily be based on our own archaeological record. Only by taking into account the regional context of the communities studied is one able to ascertain to what extent defined characteristics are of a general or more specific nature, related to living in and dealing with a certain environment.

3.4.3 Bias III: the constructs of Mesolithic and Neolithic

The last bias to be analysed here is of a conceptual nature and concerns the meaning and implications of the terms Mesolithic and Neolithic. After Thomsen divided prehistory according to his Three Age System, Lubbock (1865) subdivided the Stone Age into a Palaeolithic and a Neolithic era. The main criterion for the latter period was the presence of polished stone tools as opposed to chipped tools.

Later, other elements were added such as pottery, which is still one of the main characteristics of the Neolithic in Russia (*e.g.* Gronenborn 2003[a]). In '*The Dawn of European Civilisation*' (1976 (1925)), Childe advanced food-production as the main distinguishing criterion for the Neolithic, an idea adopted from Elliot Smith (*e.g.* Pluciennik 1998; Raemaekers 1999), which became applied widely as the primary determinant. Apart from economical or material correlates however, the concept of the Neolithic in time also became imbued with technological, social and ideological meaning (*e.g.* Hodder 1990, Thomas 1999). Especially in the light of demic diffusion these different traits were often seen as a package deal of which the identification of one (or more) element(s) signalled the presence of the rest (*cf.* Price 2000[a], 5).

The acceptance of the Mesolithic was not undisputed. Westropp conceived the term Mesolithic in 1872 to accommodate for the hiatus existing between Lubbocks' Old Stone Age and the Neolithic. For historical reasons the term did not catch on, mainly because its usage was internally inconsistent (Rowley-Conwy 1996, 940-944). Eventually it did but it was seen as a period of stagnation, degeneration and decline between the artefactually rich and more imaginative Palaeolithic and Neolithic periods (Childe 1976 (1925); Clark 1978). Later the rich results of excavations at Starr Carr (Clark 1954) and the general reappraisal of hunter-gatherers initiated by the 'Man the Hunter' conference (Lee/DeVore 1968; Sahlins 1968), led to a revision of the Mesolithic period. From the 1980s the concept of complexity and the shifting emphasis in favour of a significant indigenous contribution to the process of Neolithisation (*cf. supra*), further consolidated its chronological and historical position (*e.g.* Pluciennik 1998; Price 2000[a]; Zvelebil 1986[a,b]).

Both the concepts of Meso- and Neolithic have become universally accepted. Their meaning or connotations, however, have remained subject to frequent alterations and additions, but these have failed to accommodate for the existing variability both of the Mesolithic and the Neolithic (*e.g.* Zvelebil 1986[a], 6). This is germane to the LRA as well, since this region is characterized by 'hybrid' communities. These groups combine classical Neolithic elements such as pottery, polished stone tools, a certain level of sedentism and use of cultigens in varying proportions and compositions within an essentially hunter-gatherer way of life. From this it follows that at least the adoption, if not the existence, of a 'Neolithic package' can be refuted for these communities. Since the existing terminology has proved to be inadequate, various subcategories like Subneolithic or Forest Neolithic have been introduced (*e.g.* Werbart 1998; Zvelebil 1986[a,b]). It may, however, be argued as well that the categories defined are perhaps superfluous. Czerniak argues: *'…it can be concluded that there are no true definitions of such concepts as the Neolithic. The answers to what occurred in the Neolithic transition are based on a complex set of assumptions, only a few of which can be, and have been, subjected to empirical investigation*' (1998, 30).

This loss of meaning of the constructs of Mesolithic and Neolithic, the limits of generalization within the process of Neolithisation, poses problems in defining an overarching conceptual framework in the study of the transition to agriculture. One answer has been to abandon existing terminology altogether (*e.g.* Gamble 1986b, 33-34, 40; Zvelebil 1986[a], 6-7), yet this transforms archaeologists into researchers of specific historic particularities, failing to detect interconnectedness as well as understanding what Neolithisation is about (see Czerniak 1998, 29;

Raemaekers 1999, 12). A more popular approach has been the definition of subsistence and the dependence of communities on domesticates and cultigens to be the *'prime marker'* of the Neolithic (*e.g.* Louwe Kooijmans 1998[a,b]; Raemaekers 1999; Zvelebil 1986[a]; Zvelebil/Rowley-Conwy 1984). However one may wonder whether *'the hegemony of subsistence as the defining feature of the Neolithic'* (Pluciennik 1998, 77) is justified. Pluciennik (2008, 27) argues that a sole focus on the transition in subsistence could also lead to a conceptually homogenous Neolithic, in the same way that hunter-gatherers were often characterized in ecological terms. Especially in the light of the criticism over the decoupling of ideology and subsistence (*cf. supra*; Rowley-Conwy 2004), this also applies to the economic side of the debate.

Over the past decade several scholars have attempted to bridge this theoretical and conceptual gap by offering hypothetical solutions as well as suggestions for further research (*e.g.* Czerniak 1998, Pluciennik 1998, Zvelebil 1989). More often than not these have remained on a supra-regional and abstract theoretical level. In order to address the above-mentioned problems archaeologically, it is necessary to (re)define the conceptual parameters within which we study the transition to agriculture in the LRA.

Dealing with Neolithic premises

As already noted above, the main emphasis in characterizing the Neolithic and Neolithisation has shifted from material innovation to economic change marked by the transition from 'living off the land' to actual food production (*e.g.* Zvelebil/Lillie 2000). Ever since Childe (*e.g.* 1958; 1976(1925)), the agricultural premise, in combination with other traits such as house construction, sedentism and pottery, has formed the primary constituent of what has been conceived of as 'the Neolithic package' (see Price 2000[a], 4-5). In this way the Neolithic is interpreted as a unified phenomenon, the individual elements of which signal the presence of the whole. Over the years various scholars have rightly addressed the temporal and spatial incongruities involved with this point of view and questioned the existence of a coherent, integrated set of cultural and economic traits altogether (*e.g.* Bogucki 1987; Czerniak 1998; Thomas 1996[a], 310; Edmonds 1999, 6).[12] This formed the basis for our awareness of the diversity and spatiotemporal variety existing in the many transitions to agriculture, of the mosaic as it were (*cf.* Robb/Miracle 2007; Tringham 2000[a]) of regionally specific situations.

Nevertheless it should be acknowledged that identifying a set of characteristic 'benchmarks' for the Neolithic has remained important. 'Unpacking' the Neolithic will continually lead to the identification of certain elements or traits which from a general perspective remain 'typically Neolithic'. Whittle (1999, 6) therefore argues that the existence of some form of 'agricultural package' is still widely accepted, but it is argued here that the identification and composition of such a set of traits can and should only function as an idealized template against which actual data may be tested. As such, these traits or characteristics act as general points of reference. From this perspective a 'classic' outline of the Neolithic of Northwestern Europe can be drawn. To what extent this outline applies to regions and areas of study should remain to be determined. For the LRA it may be added that much of our perception on what the Neolithic is about is coloured by the Danubian LBK Neolithic and perhaps to a lesser extent by the later TRB groups. As for example argued by Louwe Kooijmans (1998[b], 41, 49), the LBK should be

seen as a rather unique Neolithic phenomenon. Its rigid characteristics differed not only from the existing indigenous communities, but also from ensuing Neolithic groups. The more mobile existence and different exploitation of the landscape of this evolved Neolithic, such as the MK, may have been more in line with and perhaps even partially rooted in the lifeways of previous indigenous groups (*e.g.* Crombé/Vanmontfort 2007; Thomas 1996[a]; Vanmontfort 2007). Defining typically 'Neolithic premises' therefore may sometimes become a dangerously subjective endeavour (see also Chapter 6).

3.5 Perspectives on Neolithisation

As demonstrated above a number of factors influence the debate on the transition to agriculture. These range from the regional landscape and geomorphological situation to general theoretical issues. It is important to be aware of these aspects as well as the manner in which they influence our perspective on the situation in the LRA. In the following, therefore, a general outline will be given as to how this study will negotiate these issues as well as a definition of the perspectives from which it intends to approach the process of Neolithisation.

1. The constructs of both the Mesolithic and the Neolithic are retained as conceptual tools. Chronologically both are linked with partially concurrent cultural phenomena; the Late Mesolithic ending with either the start of the LBK (5300 cal BC) or Swifterbant Culture (4900 cal BC) (*cf.* Lanting/Van der Plicht 1997/1998, Raemaekers 1999), or at least before the start of the MK-culture around 4400 cal BC (see Verhart 2000; Vanmontfort 2004).[13] Qualitatively the Mesolithic and Neolithic are envisaged as less rigid categories representing either end of a continuous spectrum. Both therefore are subject to constant redefinition.[14] Research should thus include an active search for the constituent elements of Neolithic society as well as its archaeological correlates (Zvelebil 1989, 382).[15] This should primarily be done within a coherent regional framework and from a bottom-up perspective.

2. The 'primacy of (domesticated) subsistence' is not regarded as the only defining criterion of the Neolithic (*contra* Zvelebil 1998[a], 9; Zvelebil/Lillie 2000). Subsistence should be correlated with or linked to other elements, be they social, ideological or material (see also Pluciennik 1998; Rowley-Conwy 2004). This could be termed a relational or contextual approach in that the specific composition of archaeological data at a site within its geographical, ecological and social context is indicative for the 'level of Neolithisation'. It is realized that within this approach subsistence remains a crucial category since it is a less ambiguous and more direct indication of the dependence on domesticates. Its importance however clearly hinges upon its use. Zvelebil (1998[a], 11) and Raemaekers (1999, 13) argue that the presence of domesticates should be correlated or calibrated for a regional scale or cultural unit to compensate for taphonomically induced variability as well as existing site variability. This is understandable yet problematic, since it assumes that what is defined by pottery and associated artefacts are in fact also economically and socially homogeneous communities. Furthermore, it also suggests that the transition to agriculture was a unidirectional event. To avoid these culture-historical connotations in this study, subsistence will primarily

be established and calibrated per site. Extrapolation should then take place on the basis of contextual and archaeological arguments (see Chapters 7 and 8). Furthermore, Raemaekers (1999, 13) argues that classification of sites should be based on absence/presence rather than proportional data, *'…because the main concern is the incorporation of domesticates in the subsistence base rather than the proportion of people's diet provided by domestic animals…'.* This, however, is questionable, since it approaches Neolithisation as something rather static, an either/or situation. According to this study communities should, when possible, be appreciated on a qualitative basis. For domesticates and cultigens this specifically relates to quantity and proportion. Keeping a goat is altogether different from having to rely on and tending a substantial herd of cows.

3. It is time to inject the debate on the transition to agriculture in the LRA with an appropriate dose of historicity. Studying the process of Neolithisation can be regarded as studying a mosaic of different situations and particularities (*cf.* Tringham 2000[a], 53). There is a certain risk in trying to define general nomothetic laws or aspects of Neolithisation even within a region like the LRA. Czerniak in this respect refers to pitfalls of universalism, rationalism and progress (1998, 30-31). However one cannot deny the fact that eventually, after several millennia, the hunter-gatherers of the LRA did become farmers (Louwe Kooijmans 1998[b], 15, 39, 50). The introduction of historicity therefore is not intended as a justification to stop searching for structure or specific characteristics. Rather it is a potential tool for investigating the variability existing within the period of transition and shifts the focus from the concepts of Meso- and Neolithic to the period of transition as such (*cf.* Pluciennik 1998, 79).

4. A final perspective is formed by the necessity to study the process of Neolithisation from a meaningful regional perspective that incorporates aspects of landscape and environment and relates these to the communities living there. This is based on the notion that the inhabitation of a certain region and the connection between people and their land, significantly shaped by their perception of it, may form an important factor in the overall disposition of these groups and contribute to their *mentalité* or even identity (*e.g.* De Coppet 1985; Ingold 2000). This in turn also potentially influences how they approach, use and incorporate new resources. This will be further elaborated upon in Chapters 6-9. The LRA as a research area is too large to answer these questions, simply because of the various and contemporaneous regional developments taking place, in different cultural as well as physical settings. The emphasis will therefore be placed on defining the existence of regionally distinct traditions for the Late Mesolithic (Chapter 5). For the subsequent communities in transition to agriculture, attention will shift to the characteristics of inhabiting the wetlands and their margins (Chapters 6-8). Since most of the sites in the cultural sequence from Swifterbant to Vlaardingen are situated in or near the wetlands these and their landscape and environmental qualities will be argued to be meaningful in relation to both the communities living there as well as the development of Neolithisation.

3.6 Concluding remarks

The previous two chapters have provided a general outline regarding the archaeology and theoretical debate of the process of Neolithisation, from a European perspective as well as focusing on the LRA study area. The main points that arose from this exercise concerned the necessity to analyse and interpret the situation in the LRA within a regionally coherent context and without rigid ideas concerning the meaning and connotations of Mesolithic, Neolithic and the transition between them. The aim in the following chapters is to arrive at an analysis of the transition to agriculture in the LRA that is, importantly, rooted in both the communities and region itself and that approaches the process of Neolithisation less from its general implications and more from indigenous perception. The potential of different regional characteristics will be examined through an analysis of Late Mesolithic sites within the LRA as well as for the Late Mesolithic-Vlaardingen continuum in the wetlands (*cf. supra*). Different aspects of these topics will be addressed. However, the following chapter will first deal with the characteristics, deficiencies and potential of the available dataset, addressing both methodological and taphonomic issues as well as the upland-wetland dichotomy.

Notes

1 Another Neolithic culture is the La Hoguette group. Within the area of research it is mainly known from concentrations of flint and mostly bone- or shell-tempered sherds as attested by sites such as Sweikhuizen, Gassel, Ede-Frankeneng and Langweiler (Brounen/De Jong 1988; Brounen *et al.* 2010; Lüning *et al.* 1989; Modderman 1987; Schut 1988). According to Raemaekers (1999, 136-138) it predates LBK within the LRA, because, as opposed to the *Älteste* LBK further south, it is absent from its assemblages. However it is found in a LBK context on the Aldenhovener Platte in Germany (Lüning *et al.* 1989, 383) and at the Graetheide-cluster (Brounen/Vromen 1990) suggesting this is probably due to a lack of research further complicated by difficulties of identification.

2 Recently Lanting and Van der Plicht (1999/2000, 42-46) put forward arguments indicating that the LBK in these parts might have started later (around 5230 cal BC) and ended earlier, lasting no more than 230 years for Southern Limburg.

3 Although geographically hardly separable, Blicquy and Rössen are often interpreted as possibly two culturally distinctive groups (*cf.* Louwe Kooijmans 2005[a], 250). On the basis of artefactual and architectural evidence however Blicquy and the Rössen-linked cultural phenomena of Grossgartach and Hinkelstein seem to be clearly related (see Costantin/Illett 1998, 209-214).

4 In the east the Bisscheim-phase forms the bridge between the Rössen and Michelsberg culture. In the west there seems to be a chronological hiatus between the Blicquy group and the Michelsberg culture (*cf.* Lanting and Van der Plicht 1999/2000, 18; Vanmontfort 2004, 300). This is probably linked to a research bias.

5 It is important to note that the dispersal of *Breitkeile* involves large parts of the North European Plain. This indicates that in spite of a lack of sites on the upland coversand, the area was frequented and possibly also inhabited by people of the Swifterbant culture or contemporaneous groups. It also underscores the intensity of contacts between these groups and those of the southern Neolithic between 4900 and 4400 cal BC. In contrast not many *Breitkeile* have been found in a settlement context. Two fragments were found at Swifterbant-S3 (Raemaekers 1999), and several other pieces at Hüde I (Stapel 1991). Furthermore one complete *Breitkeil* was found in open association at the Late Mesolithic sites of Helmond-Stiphoutsbroek (Arts 1994), as well as an adze in a similar open context at Gassel-Over de Voort (Brounen/De Jong 1988).

6 For recent overviews of Swifterbant pottery in the LRA see Crombé *et al.* 2011[a]; Louwe Kooijmans 2011; Raemaekers 2011.

7 Raemaekers (1997) provides further arguments against a cultural 'assimilation' of the Ertebølle and Swifterbant cultures. Apart from similarities there are various marked differences between the two.

8 The presence of cereals and pollen of cereals at Schokland-P14 is not discussed here because of problems involving the stratigraphy and dating of the individual layers at this site. This specifically involves the long time spans represented by layers A, B and C. The supposed ard marks found at Urk-E4 are also excluded because of problems of identification and interpretation (see Appendix I).

9 Around 10.000 BP the sea-level was still 40-50 meters below NAP. Great Britain was still part of the continent and a large part of the North Sea basin was dry. At the start of the Atlantic, a mere 2000 years later, the present coastline was reached as the sea encroached even further inland (*cf.* De Mulder *et al.* 2003, 216-217).

10 This severely hampers the interpretation of and relative importance attached to marine resources, coastal settlement and suitability for agriculture (Price 1987, 242; Raemaekers 2003, 746). According to Van Gijsel and Van der Valk (2005, 68) and Vos and Kiden (2005, 31), this stagnation took place somewhere between 4500 and 4000 cal BC.

11 The construct of complex hunter-gatherers was partly a reaction to Sahlins' 'Original Affluent Forager' (1968) (Zvelebil 1986, 8). Publications by Binford (1980) and Woodburn (1980) were instrumental in creating an awareness of a different kind of hunter-gatherers: less prone to opportunistic foraging, but employing a logistic mobility, delayed return systems, aspects of sedentism etc. (Rowley-Conwy 2001).

12 This has led some to try and identify a specific order as to what traits came first in a certain area or region. Thomas (1999), for example, argues for material (monumental) change and accompanying changes in society in large parts of Britain, prior to major economic transitions. Similar approaches are adopted by Whittle (1999) and Edmonds (1999), while Hodder (1990; 1998), stresses the socio-symbolic and ideological aspects of Neolithisation as crucial in enabling economic change on an even larger scale. Criticism of these approaches correctly addressed the methodological and taphonomic shortcomings of the data involved (Madsen 1986; Rowley-Conwy 2004).

13 Another possibly earlier representative of the primary Neolithic in the LRA is the La Hoguette group. However, many issues concerning chronology, subsistence and relations to the LBK remain to be solved (see Louwe Kooijmans 1998[a], 410, Lanting/Van der Plicht 1999/2000, 14-15).

14 Thomas (1988, 59) clearly points out that the transition from the Mesolithic to the Neolithic is also a point at which our perception of the past changes. The former is linked to a Palaeolithic tradition concerned with human behaviour in terms of adaptive responses to environmental pressures; the latter considers human beings as purposive subjects, acting in pursuit of socially defined goals (Bailey/Milner 2003). It goes without saying that these models are obsolete even for the most classical cultural exponents of either the Mesolithic or the Neolithic but they are of course especially defunct when communities harbouring aspects of both are studied, such as those in the LRA.

15 From this perspective it may be argued that the 'transition to agriculture' is not synonymous with the 'process of Neolithisation'. While both terms will be used in this study the former stresses the importance of agriculture as the distinguishing criterion, while the latter potentially incorporates many other developments and aspects. Use of the former therefore best fits the chronological period studied, while the latter more aptly defines the process and changes at hand.