A Living Landscape : Bronze Age settlement sites in the Dutch river area (c. 2000-800 BC)

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7 Bronze Age settlement dynamics in the Dutch river area

7.1 Introduction

This chapter addresses the dynamics of Bronze Age settlements in the Dutch river area. Whereas the preceding chapters have been concerned with the stage (chapters 2-3) and actors (chapters 4-6) of Bronze Age settlement archaeology in the Dutch river area, their specific interplay is the focus of the present chapter. Settlement dynamics in this area involve an entangled set of different but interrelated types of dynamics, such as landscape dynamics, landscape use dynamics and cultural dynamics. As such, it is virtually impossible to discuss separately the dynamics of the physical landscape, cultural dynamics and the way these two together influenced the use of space. Therefore, in this chapter such interrelated dynamics are discussed together on a chronological axis.

For the different periods under study, the settlement dynamics are analyzed. A long-term diachronic approach is used to characterize the nature, duration and locational stability of human activities. In this, answers to various questions are sought: Were settlement sites the dominant site type? Were these sites settled permanently? Did additional types of sites exist and what function and duration of use may be assumed for these? Moreover, specific attention is paid to the relations between settlement dynamics and fluvial dynamics: are settlements situated, for instance, solely on levee- and crevasse splay deposits of inactive fluvial systems? If so, how and why does the human usage differ for active and fluvial systems? Answers to such and similar questions provide insight into (the changes in) the ways in which prehistoric communities dealt with – the dynamics of – their surroundings, and the changes taken place in it. Such information is necessary to characterize the settlement dynamics for the Bronze Age periods proper, but also to outline and investigate its significance as part of wider diachronic variation in later prehistoric settlement dynamics.

Such questions may be answered by a detailed study of the remains preserved for the different periods in combination with analyses of the geogentic contexts of these. Additionally, any discussion of settlement dynamics should take into account the societal processes and developments playing at larger temporal (long-term developments) and spatial (supra-local or regional) scales. Therefore, the discussions presented below on the nature of human activities within the study area for the separate periods, are preceded by brief introductions specifying the established views on the settlement dynamics for the periods in question. Starting from the Neolithic, the settlement dynamics of the prehistoric occupation of the Dutch river area will be traced up to the Early Iron Age.

7.2 The onset: Neolithic to Middle Bronze Age-A occupation in the Dutch river area

7.2.1 Models for (Middle to Late) Neolithic and Early Bronze Age settlement dynamics

Neolithic societies in the Low Countries are traditionally conceived of as being characterized by a more spatially and temporally differentiated settlement dynamics compared to later Bronze Age occupation. During the (middle) Neolithic, a larger number of places in the landscape were presumably used for a wider range of tasks. Moreover, these places are thought to have seen a different nature and duration of use in comparison to more permanently occupied domestic sites. Among such additional sites are included raw material procurement (*i.e.* extraction) sites, hunting camps, fishing sites *et cetera*. For some domestic sites, it may be debated whether they were permanently occupied (*i.e.* year-round) or only during certain seasons, but the task-specific sites supposedly did not support continuous habitation. Rather, such sites may have been part of more short-term (*e.g.* daily, monthly, seasonally or even annual) excursions by certain members of the local communities.[1] While characterized by a subsistence strategy based largely to predominantly on cultivated cereals and livestock and only partly on hunting,[2] these communities are ascribed significant settlement differentiation and mobility.[3] Louwe Kooijmans (1993a, 97) classified such a system of long-term seasonal settlements in different ecozones with optional extraction camps as 'restricted residential mobility'.

1 Louwe Kooijmans 1987, 250-251; 1993a, 88-105; Fokkens 2005a, 362; Bakels & Zeiler 2005, 333.
2 *I.e.* quasi-mixed farming; *sensu* Louwe Kooijmans 1993a, 103; Bakels & Zeiler 2005, 329-333, *cf.* Arnoldussen & Fontijn 2006, 299 fig. 8.
3 *Cf.* Van Gijn & Bakker 2005, 293; 298-299; Raemaekers 2003, 744.

Two visualizations of such systems of settlement dynamics, for two different periods, are depicted in figure 7.1. Despite superficial differences, both models bring across a similar image of more fixed (domestic) sites from which

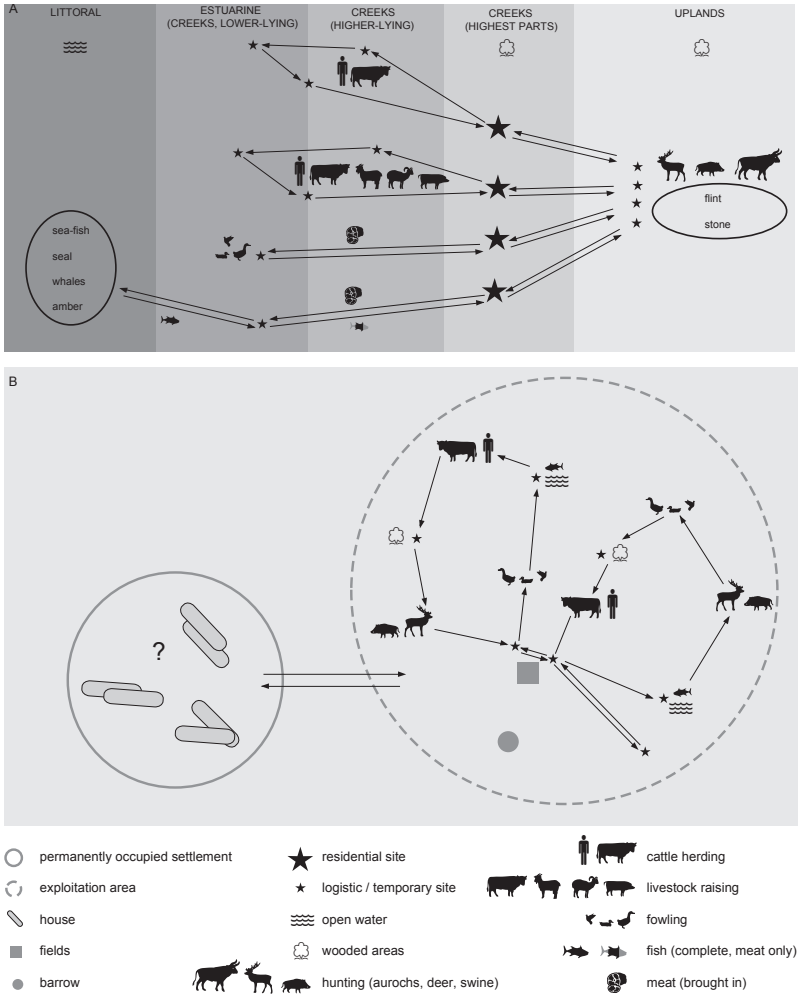

Fig. 7.1 Models showing the dynamics and mobility of Late Neolithic Single Grave culture period (*c.* 3050-2600 cal BC) settlements in the western Netherlands (A: after Hogestijn 2001, 152 fig. 5) and Early Bronze Age (*c.* 2000-1800 cal BC) settlement sites in the Dutch river area (B: after Jongste 2002b, 619 fig. 11.11).

a wider environment was exploited by means of smaller additional sites ('logistic sites', 'extraction sites', 'camps'). Moreover, both representations are unfortunately fairly unspecific as to what the exact relations were between these two main classes of sites. Was there, for instance, a correlation or correspondence between the two classes (*e.g.* were the smaller sites used exclusively by one larger domestic site or were these shared?)? In addition, in both models some elements function whose presence seems more anecdotal and is not explained in relation to the other elements (*e.g.* the meat in fig. 7.1, A, the barrow and fields in fig. 7.1, B). While both models draw attention to the function(s) of such additional sites (the 'why'), they are less informative on the duration ('how long'), the location (the 'where') and the importance (qualitative and quantitative) of such sites within the overall settlement dynamics for these two periods. Essentially, both provide no more and no less than interpretative frameworks within which excavated sites can be meaningfully represented as parts of an overall system of settlement dynamics.

Long-term approaches to settlement dynamics run the risk of oversimplifying and over-contrasting sites from different periods. It appears that in more interpretative accounts of settlement dynamics between the fourth to the first millennium BC, often an implicit evolutionist (almost teleological) progression can be identified. In such

narratives, Mesolithic communities are periodically on the move between sites of different functions, while hunting plays an important role. During the (middle?) Neolithic, less diverse locations are part of the settlement system and the periods of use of particular sites differ more distinctly. While some activities, among which hunting and fowling *et cetera*, are still undertaken in different parts of the landscape, a significantly larger part of time is spent at (semi-?)permanent settlements. With the Late Neolithic, hunting was presumably only marginally relevant to subsistence strategies and permanent settlement sites predominate. This then all culminates in the Bronze Age, when permanent settlements are the focal points in the landscape and only very limited time is spent elsewhere. This kind of narrative structure can be modeled along three axes, which are the role of hunting, the degree of difference in site-use duration and the variability in site types (fig. 7.2).

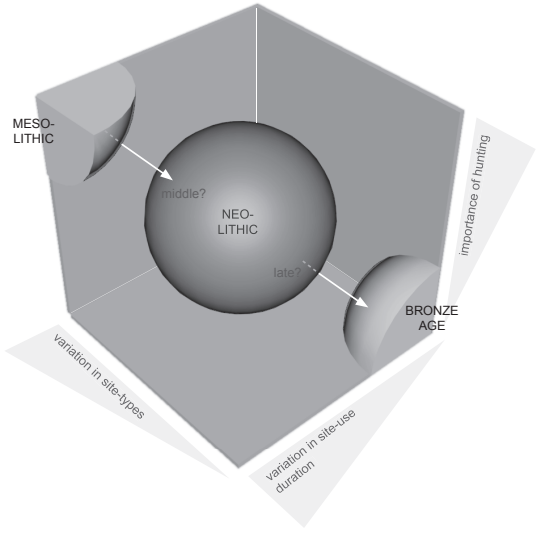

Fig. 7.2 Schematic representation of a common narrative structure used in long-term analyses of settlement dynamics. Site interpretation is in such approaches frequently modelled on the degree of difference in site-use duration (y-axis), the variability in site types (x-axis) and the importance of hunting (z-axis). Evolutionistic interpretations thus assume a progression from the top-left sphere segment (Mesolithic), via the central sphere (Neolithic), to the Bronze Age (bottom-right sphere segment).

The model presented as figure 7.2 may represent a common narrative or interpretative framework, but it should be stressed here that I by no means consider it to be a reliable or data-based reflection of long-term settlement dynamics. Rather, it serves here as an source of inspiration for the compilation of more specific questions that serve to establish the validity of such narratives. Consequently, in order to assess whether and where the sites from the Dutch central river area may be placed and interpreted in such models, we should first turn our attention to the factual indications for settlement dynamics in the excavated remains for the periods under study.

7.2.2 Neolithic sites and site types in the Dutch river area

The Middle Neolithic

Many of the Late Pleistocene and early Holocene aeolian river dunes (dutch: *donken*) in the Dutch river area supported Middle Neolithic occupation.[4] At these locations, presumably more permanent occupation took place and from these, more distant and lower-lying areas were exploited. Examples of such additional sites may be the fowling and fishing

4 *E.g.* De Kok 1965; Louwe Kooijmans 1968; 1974, 125-168; 1993b, 118 fig. 7; 2001a; 2001b, *cf.* Amkreutz *in prep.* There is also considerable evidence for Middle Neolithic(-B); *c.* 3400-2900 cal BC occupation of coastal dunes and barriers (*e.g.* Van Regteren Altena *et al.* 1962a-c; 1964; Glasbergen *et al.* 1967a-b; Verhart 1992; Koot & Van der Have 2001; Louwe Kooijmans & Jongste 2006) and tidal creeks (*e.g.* Louwe Kooijmans 1987; Van Beek 1990; Gehasse 1995; Goossens *in prep.*), but as these sites are situated more distant from the present study area (*cf.* fig. 1.3) they are not dealt with in detail here. See also Diependaele *in prep.*, for a Middle Neolithic to Late Neolithic-A site on crevasse splay deposits of the Oude Rijn fluvial system.

camp at Bergschenhoek (*c.* 3450 cal BC; Louwe Kooijmans 1987, 238-242) or the weirs and fish-traps at Emmeloord (Bulten, Van der Heijden & Hamburg 2002). In addition to the *donken*, levee deposits of fossil rivers were also used for habitation. At Ewijk, levee deposits of a fossil – but possibly re-activated – river course yielded remains datable to the Vlaardingen culture period (*c.* 3400-2600 cal BC).[5] As finds were recovered there from the residual gully fill consisting of humic clay to clayey-peat (Clason 1990, 64 fig. 2) it is improbable that this gully was still active at that time (Berendsen & Stouthamer 2001, 245).[6] Possibly, habitation of unknown permanency and duration was situated on the levees next to it (but these were eroded by later fluvial activity, and it cannot be excluded that the finds in the residual gully were washed from their original location (*cf.* Asmussen & Moree 1987, 55)).

The levees of active river systems in the study area were also used by people in the Middle Neolithic, but no sites have been sufficiently extensively excavated to assess the exact nature and duration of such activities. At Zijderveld, pollen analysis suggests that human activities took place on the levees of the eponymous fluvial system (De Jong 1970-1971, fig. 8).[7] Some flint artefacts and pottery sherds of possible Middle Neolithic age were recovered during the 2005 excavations (Knippenberg & Jongste 2005, 80; 84). As these were found embedded in the levee deposits of the Zijderveld fluvial system and were not associated with a vegetation horizon or evident signs of erosion, the Zijderveld fluvial system was still active then. A radiocarbon date from the residual gully suggests that fluvial activity ceased between *c.* 2870-2480 cal BC (Berendsen & Hoek 2005, 21), confirming a Middle Neolithic Age for these Zijderveld artefacts.

Within the De Bogen macro-region, several find-spots of presumably Middle Neolithic artefacts are known, but their exact dating is often imprecise as they predominantly concern pottery fragments and fragments from polished axes (see Appendix III for details). Moreover, there is usually not enough information on the original context of the finds. Only near the Nieuwe Provinciale Weg at Geldermalsen could it be documented that Vlaardingen-culture period sherds were found in a washed position (Hulst 1973, 28; 1975c, 81). During the Middle Neolithic, several fluvial systems were active in the De Bogen macro-region (Chapter 2; Appendix III). One or several of these created the complex stacked crevasse splay deposits on which the Late Neolithic and Bronze Age occupation took place (*cf.* fig. 2.9). When exactly these crevasse splays were formed is unclear. A combined sample from two residual crevasse gullies at De Bogen sites 28-2 and 28-3 yielded a *terminus ante quem* age of *c.* 3520-3100 cal BC, which indicates a Middle Neolithic age for their formation.[8] As some presumed Middle Neolithic sherds were recovered from De Bogen site 30 (Jongste & Smits 1998, 30-31; Appendix III, table III.5), the crevasse splay deposits of active systems may have been used as well.[9] Unfortunately, the exact stratigraphic context of these sherds is not specified.[10]

Additional support for Middle Neolithic use of crevasse deposits of still active fluvial systems, can be found in the Dodewaard macro-region. Middle Neolithic ceramics and some flint tools were discovered at several sites where test-trenches were dug prior to the Betuweroute railway construction.[11] However, these finds were recovered from a layer that contained mostly Middle Bronze Age ceramics, and they are best interpreted as having been incorporated unintentionally. The same applies to the Middle Neolithic finds uncovered in the main Dodewaard excavation

5 Louwe Kooijmans 1985, 145-146; Janssen 1989; Clason 1990.

6 A sample from the residual gully situated 310 m to the northwest was dated to *c.* 3980-3790 cal BC (GrN-11290: 5105 ± 40 BP; Berendsen & Stouthamer 2001, 151), suggesting the landscape had been fossil for several centuries prior to the Vlaardingen culture period phase of usage (*cf.* Louwe Kooijmans (1985, 50) who argues – for the coastal barriers – that these may have been more favourable locations for Vlaardingen period occupants when a more developed forest was present. Possibly, this may also explain the time difference between the cease of fluvial activity and documented remains at Ewijk).

7 For the Eigenblok excavations as well, pollen data pointed towards Middle Neolithic human activities (Brinkkemper *et al.* 2002, 448-449) whose exact nature, however, could not be determined.

8 AA-37523: 4600 ± 45 BP; Van Zijverden 2002b, 79-80.

9 For example, the 'Buren type' axe found at Noordeloos (to the west of the study area), may have originated from a crevasse splay deposit of the Schoonrewoerd fluvial system (Arnoldussen 2000, 82 fig. 6.5). This find – if not secondarily displaced – renders a Late Neolithic-B start for the Schoonrewoerd system (as proposed by Berendsen & Hoek 2005, 27) improbable.

10 But see Jongste & Smits 1998, 22 fig. 4b. It is suggested that some finds (of unspecified age) were found in the crevasse and floodbasin deposits at levels not associated with vegetation horizons, so possibly during periods of fluvial activity.

11 Bulten 1998a-c; Bulten & Smits 1998; Ten Anscher & Van der Roest 1997; Appendix VI.

(Theunissen & Hulst 1999a, 153-154). Only for site 34 (Dodewaard - Peyenkampse Veldweg; Bulten 1998b) can the nature of the Middle Neolithic occupation in the Dodewaard macro-region be understood more clearly.[12] At this site, at 60 cm below the present-day surface, a finds-layer was discovered that contained Late Neolithic pottery and flint artefacts (Bulten 1998b, 12-19). At 20 cm depth below this layer, another finds-layer and a ditch were uncovered, the latter containing charred emmer wheat, Middle Neolithic pottery and flint flakes. Probably, a Middle Neolithic settlement was present at that location, but most of the surface level of this site is thought to have been eroded by later crevasse formation (*ibid*.; Appendix VI). The ditch was dug into crevasse splay deposits, and a younger layer of crevasse deposits also separated this layer from the upper finds-layer. Most likely, this are two distinct phases of crevasse splay formation by (a precursor to) the Distelkamp-Afferden fluvial system that was active from the Middle Neolithic-B to the Iron Age (Berendsen & Stouthamer 2001, 197; Appendix VI).

For the Middle Neolithic remains uncovered in the Wijk bij Duurstede macro-region (Hessing & Steenbeek 1990, 15; Appendix IV) and near Tiel (Arnoldussen 2000, 35-39; Van Zijverden 2007, 21 fig. 2.7) there is insufficient clarity on their stratigraphic context to use them in discussions of site locations and dynamics.[13]

Middle Neolithic settlement dynamics in the study area: a conclusion

After having presented the available data for this period in the sections above, is it possible to comment upon the settlement dynamics for the Middle Neolithic in the study area? The answer is predominantly negative. While find-spots datable to this period are known in some numbers, the finds were usually no longer in their original stratigraphic context, or no context was published. In any case, the aeolian river dunes west of the study area supported habitation and, where investigated, frequently yielded artefacts in quantities, states and numbers that suggested an interpretation as (semi-?)permanent domestic sites. Yet, it should be stressed that without extensive excavation, it remains unknown if this material resulted from recurrent brief or seasonal use, or from (semi-)permanent occupation.

Clear-cut indicators for permanency of occupation are difficult to establish in the first place (*cf.* Louwe Kooijmans 1993a, 90-95; Raemaekers 1999, 115-125) and possible promising correlates such as seasonally informative bone assemblages, domestic structures or plough marks are generally not encountered in smaller excavations or chance discoveries.[14] Moreover, the Middle Neolithic occupation in the study area has never been the focus of specifically targeted research and finds-layers are generally situated below the reach of modern ploughs, which decreases detectability as chance finds and during survey campaigns. Therefore, the data that *is* available, is a dangerous underestimate of the real numbers, types, extents and densities of sites once present. In short, no evident 'camps', 'extraction sites' or '(semi-)permanent settlement sites' can be outlined in the study area at present.[15]

Nonetheless, the available – albeit anecdotal – evidence indicates that levee deposits of active (Zijderveld),[16] as well as inactive systems (Ewijk; inactive for several centuries) were utilized by Middle Neolithic communities. The diverse nature of the remains at Ewijk may indicate a domestic function for the (assumed) eroded site nearby.

12 For the full overview see Appendix VI, esp. fig. VI.4.

13 For the area around Tiel, the lack of direct dates framing the phase(s) of activity of the Zoelen fluvial system especially hampers the interpretation. Overlapping with the suspected location of the Zoelen channel-bed deposits, Vlaardingen-culture period and Single Grave Culture period finds are known. It is unclear whether the Zoelen system was still active at that time. Some Early Bronze Age finds are also known from similar locations, but it is not clear whether they are situated at the same stratigraphic level. It is clear, however, that the Zoelen system was reactivated prior to the Middle Bronze Age-B occupation, as new levee- and crevasse deposits formed that underlie the Middle Bronze Age and younger occupation (Van Zijverden 2007, esp. fig. 2.7).

14 Possibly also graves may be added to this list (but see Louwe Kooijmans 1993a, 92).

15 But see Louwe Kooijmans 1987, 250-251 (Bergschenhoek, *c.* 4200 cal BC); 1987, 243-250 (Hekelingen III, *c.* 3000-2600 cal BC); 1993a, 94 (and references therein); 2005, 264 (Hazendonk, *c.* 3850-3600 cal BC); Verhart & Louwe Kooijmans 1989, 104-107 (Gassel, Middle Neolithic); Hogestijn, Bulten & Koudijs 1994, 28 (Slootdorp - Kreukelhof, *c.* 3400-2900 cal BC); Hogestijn 1994, 147 (Mienakker, *c.* 2860-2570 cal BC) for Middle- to Late Neolithic examples of such sites outside the present study area.

16 The stratigraphy caused by ongoing sedimentation at Hekelingen III during the Vlaardingen period (Louwe Kooijmans 1974, 244; Louwe Kooijmans & Van de Velde 1980, 10-11) also indicates human activities on active fluvial systems.

The Zijderveld remains are too few to postulate a similar function for.[17] Possibly, active levees were either used less frequently, or in a different manner compared to levees of fossil systems (*cf.* sections 2.7.1-2.7.2). Crevasse splay deposits were in any case also used during the Middle Neolithic period. The discovered ditch fragment at Dodewaard - site 34 presents tangible evidence thereof. For the other Middle Neolithic artefacts from the Dodewaard macro-region, it is plausible (but not definitively proven) that they were situated on crevasse splays deposited by fluvial systems that were active during the Middle Neolithic. The artefacts datable to this period from within the De Bogen excavations were all found in secondary contexts, which means that it remains unclear whether they were associated with active or passive crevasse splays. Consequently, to study if – and how – Middle Neolithic activities differed on crevasses splays of active and passive fluvial systems may be an important future research question. At present, there is unfortunately inadequate data to shed more light on site types and settlement dynamics for the Middle Neolithic period in the study area.

What is nonetheless clear, is that the Dutch central river area formed the north(eastern) most boundary between the Vlaardingen group sites in the south and the northwest group of the Funnel Beaker culture to the north during the Middle Neolithic (fig. 7.3).[18] The river area possibly provided a natural boundary zone against which pottery traditions can be outlined. The typical funnel-beaker decorated ceramics are scarce to absent south of the central river area, and the Vlaardingen pottery tradition with s-shaped pot profiles and rim-perforations is only very infrequently encountered to the north of it.[19] Nonetheless, there is sound evidence for contacts between these two areas. For example, axes of distinct Funnel Beaker (rectangular cross-sections) or Vlaardingen-style (*Buren*) are found in the opposite areas.[20] An additional argument may be the fact that ceramic types like baking plates and collared flasks are present in both areas as well (Van Gijn & Bakker 2005, esp. 303). Possibly, the large tidal estuary that penetrated up to the higher (boulder-clay) areas in the north-west of the Netherlands formed a key area of contact and interaction.[21] For instance, from the present-day province of Noord-Holland – which was then part of the large tidal zone – Funnel Beaker period sites (Hogestijn 1992; 2001; Drenth & Hogestijn 2001) as well as Vlaardingen group sites (Van Heeringen & Theunissen 2001b, 227-236) are found as little as 17 km apart.[22]

The reasonably easily recognizable Funnel Beaker style decorated pots are almost unknown from the central river area proper. The so far single exception are the sherds from two or three (locally made?; Bakker 1982, 90-91) pots decorated in Funnel-Beaker style from the Hazendonk (Louwe Kooijmans 1976a, 285 fig. 23) but Funnel Beaker sherds are also known in some numbers from the ice-pushed hills of the province of Utrecht that directly border the central river area in the east (*e.g.* van Tent 1979, 117). These relatively sharply contrasted distributions (Bakker 1982, 90) suggest that communities present in the river area conceived their region – in addition to as a region imbued

17 At Zoelen - Kerkenakkers significant amounts of pottery, stone and bone were recovered, which may suggest a domestic use of the site (Arnoldussen 2000, 39; Archis 22375). At Echteld - Scheele Hoek (Arnoldussen, *loc. cit.*; Archis 40498), Middle Neolithic finds originated from a large feature. While the quantity and diversity of artefacts, as well as the presence of features may indicate more permanently used sites, they are not discussed here in detail as the fluvial system on which these sites are situated (the Zoelen fluvial system) is ill-dated (see note 13). Consequently, it is not known whether, or how long, this fluvial system was inactive prior to the Middle Neolithic activities.

18 The remains classified as the Stein group are presumable the southern Netherlands, upland, counterpart to the Vlaardingen group sites known predominantly from the Holocene wetland areas (Van Gijn & Bakker 2005, 281-282; Schreurs 2005, esp. 318-319). Presumably, the Stein group continued up to the Late Neolithic-B without showing much Beaker (*e.g.* Funnel Beaker, All Over Ornamented, Single Grave period) influence (Schreurs 2005, 319; Van Hoof & Van Wijk 2005, 190).

19 For claimed Vlaardingen-style ceramics in the north-east see Bakker 1982, 90; Heidinga 1984, 6; Scholte Lubberink & Lohof 1997. For the previously claimed TRB ceramics from Herpen (Ball & Jansen 2002, 26-28, see Waterbolk 2003, 215 on the origin of the TRB axe), Drunen (Van der Lee 1976, 84) and Roggel/Neer (Archis 27298), a Late Bronze Age date cannot be excluded. Note that the coastal dunes are also part of areas where Vlaardingen-style ceramics were currrent.

20 See for instance the *Buren* type axes found at Denekamp (Bakker & Van der Waals 1973), Darp and Zwigelle (Archis 239807; 239935), the possible Vlaardingen (or TRB?) chisel of Slootdorp - Dolfijntocht (Archis 18506) or the TRB axe from Zandwerven (Bakker 1982, 94) and knob-butted axes from Leenderheide, Neeritter, Ittervoort and Bladel (Bakker 1982, 102).

21 The recent finds of Funnel Beaker Culture sherds at the sites of Hazerswoude - Turbinepark N11 (Diependaele *in prep.*; pers. comm., Feb. 2008) and Hellevoetsluis (Goossens *in prep.*; Van Hoof, pers. comm., March 2008) support the idea that the coastal estuaries and adjacent part of the river area may have been a key area of contacts.

22 The identification of ceramics from P14 as Vlaardingen (Bakker & Hogestijn 1987, 54) is no longer seen as tenable (Gehasse 1995, 219).

with other local characteristics – as a boundary zone where differences were perhaps stressed rather than bridged (*cf.* Cohen 1985, 110).

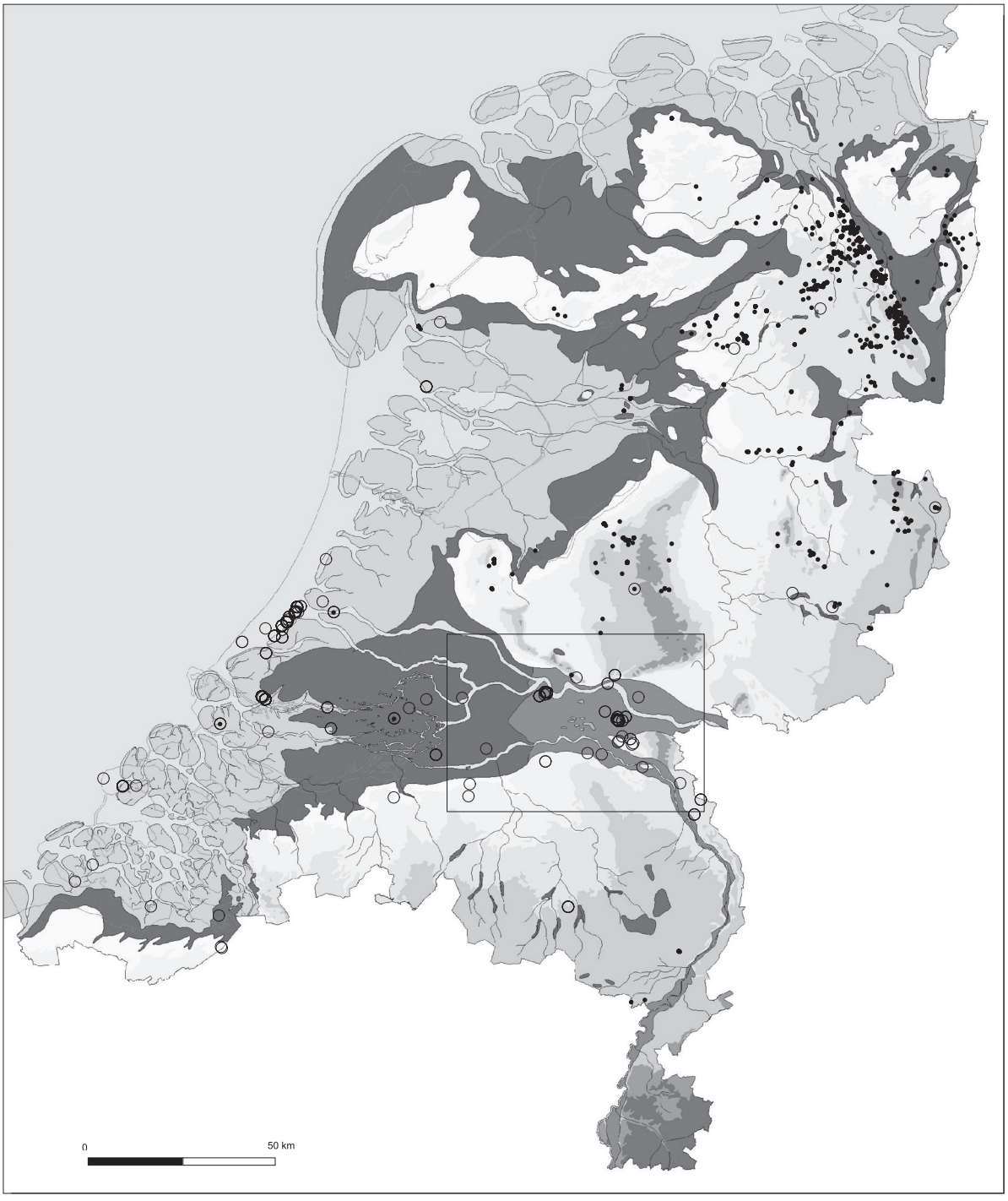

Fig. 7.3 Funnel Beaker culture sites (filled small circles, *c*. 3400-2900 cal BC) and Vlaardingen group (outlined larger circles, *c*. 3600-2500 cal BC) sites (from Dutch national Archaeological inventory Archis, maintained by the RACM, formerly ROB) plotted on a palaeogeographic map for the Netherlands around 5100 BP (from Vos 2005, map 4). The study area is indicated as the outlined frame.

The Late Neolithic

Around the end of the 4th and start of the 3rd millennium BC, the subsistence strategy of Neolithic communities shifted notably towards a strategy wherein mammal hunting no longer seems to play a dominant role. From the start of the Single Grave Culture period (*c.* 3000/2900-2500 cal BC), the dominance of hunted mammals in bone assemblages drops in nearly all sites to less than 10-20%.[23] In the (near-)coastal sites, fowling, fishing and the collecting of shellfish nonetheless continued to be of importance (Lauwerier 2001). As with the preceding Middle Neolithic period, a differentiation between presumably (yet not proven) permanently settled sites and smaller, more transient, logistic sites is envisioned (*e.g.* fig. 7.1, A; Hogestijn 2001, 153).[24]

The presence of fields, documented archaeologically by plough-marks or pollen evidence, has been forwarded by Louwe Kooijmans (1993a, 92) as reflecting the permanency of domestic sites. Therefore, much weight has been put on the role of the ard – and its archaeological correlate: the ard-mark – in the transition from the Middle- to the Late Neolithic.[25] While there is evidence that ard-based agriculture was practised during the Funnel Beaker Period,[26] it may have been more common or even the customary in the Single Grave Culture period, when such traces are more frequently encountered.[27] It is plausible that the increased labor investments in the fields – as reflected by ard-agriculture (Fokkens 1986) – helped to create bonds between households and specific places in the landscape that were claimed, effectuated or celebrated by the use of barrow burials (Van der Beek 2004, 158). This change towards a dominant agricultural strategy based on ard-agriculture may also have rendered redundant or inappropriate the hunting that previously formed part of the Middle Neolithic subsistence strategies.[28]

Regardless of when exactly ard-agriculture gained momentum, a whole new burial custom (barrows erected over individual graves) and new styles of material culture were *en vogue* at the start of the Late Neolithic. In settlements, moundless graves and in barrow interments, ceramics decorated in Northwest European Single Grave Culture styles are encountered.[29] In addition, flint daggers and perforated stone axes are found that display styles shared within wider northwest-European networks.[30] The distribution of these new styles cuts across some of the former Vlaardingen/Funnel Beaker boundary zones. Single Grave pottery is thought to be current in all areas above the present-day river Rhine in the Low Countries, as well in the main Meuse and Rhine river valleys (*e.g.* Fokkens 2005a, 359-360 fig. 16.2).[31] Only during the later All Over Ornamented (*i.e.* All Over Corded, *c.* 2600-2500 cal BC) [32] and Bell Beaker (*c.* 2500-2000 cal BC) periods, is the entire Dutch central river area thought to have been part of this more northernly distribution pattern.[33]

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23 *E.g.* Gehasse 1995, 226 table 9.12; Lauwerier 2001, 206-207; Arnoldussen & Fontijn 2006, 299 fig. 8.

24 *Cf.* Woltering 1985a, 214; 1987, 295-297; Gehasse 1995, 228; Fokkens 1998a, 107.

25 *E.g.* Sherratt 1981, esp. 286; Fokkens 1986, Tegtmeier 1993, Drenth & Lanting 1997.

26 *E.g.* at Emmerhout; Drenth & Lanting 1997, 57-59, possibly also at Groningen; Kortekaas 1987, *cf.* Drenth 2005, 335.

27 See examples in Drenth & Lanting 1997; Pronk 1999; Van Heeringen & Theunissen 2001a, 132.

28 It should be stressed here that there is nonetheless much evidence that at Single Grave Period sites situated in the near-coastal areas of rich bio(tope)-diversity, hunting, fishing and fowling was practised (Zeiler 1997). The difference with preceding periods lies in the fact that despite this more 'broad-spectrum' exploitation, domesticated species almost invariably dominate the bone assemblages (Lauwerier 2001, 206-207; Gehasse 2001, 173 table 5; De Vries 2001, 324; Arnoldussen & Fontijn 2006, 299 fig. 8).

29 *E.g.* Floore 1991; Roorda 2001; Sier 2001, Drenth 2005, 336-349, *cf.* Drenth & Bakker 2006, 5-7

30 Drenth & Lanting 1991; Buchvaldek & Strahm 1992; Suter 2002; Furholt 2003; Van der Beek 2004, 178-180; Drenth & Bakker 2006, 5.

31 Although the site of Voorschoten was situated south of the Rhine inlet (Glasbergen *et al* 1967a-b), it is perhaps best regarded as a continuation in southern direction of the Single Grave Culture period presence on the coastal barriers more to the north (*e.g.* Ten Anscher 1990, 49; Bitter 1993, 306; Woltering 1985b, 327).

32 Lanting & Van der Plicht 2002, 79-83; Van der Beek 2004, 159.

33 Fokkens 2005, 360 fig. 16.2; Drenth 2005, 335; Schreurs 2005, 319. See also Lanting & Van der Plicht (2002, 33) on possible Single Grave Culture period fragments of (type A battle-)axes and pots at Vlaardingen (Van Beek 1990, esp. 173; 203; plates S & W). The cord-decorated beaker sherd (PFB?) from Linden - Kraaienberg (Louwe Kooijmans & Verhart 1990, 62 fig. 13) from a pit with Stein-type ceramics (*cf.* Schreur 2005, 318) is a well-known possible finds-association between these two ceramic traditions. Additionally, Lanting and Van der Plicht (2002, 32; 66) dismiss the often claimed Funnel Beaker-Protruding Foot Beaker association of the late Funnel Beaker Culture period cremation grave of Emmen - Angelslo (Bakker & Van der Waals 1973, 25 fig. 9). They object that bioturbation may have caused the incorporation of the Single Grave Culture period sherd into this feature, despite opposition to this in Bakker and Van der Waals (1973, 25). As such, it may still be a case of association, but it needs to be considered with due caution.

Essentially, the ideas on what settlement dynamics were like during the Late Neolithic, do not differ essentially from those applied to the Middle Neolithic, save for a generally reduced importance of hunting. Does this mean that sites of comparable types may be expected in comparable locations? Furthermore, it may be worthwhile investigating whether the established views on the central river area as an area initially devoid of new (Single Grave period) ceramic styles, but with All Over Corded and Bell Beaker ceramics, holds true and can shed any light on the (demise of the) central river area as a possible boundary zone.

Late Neolithic sites in the study area

There are no find-spots known for the start of the Late Neolithic (*i.e.* Late Neolithic-A; 2900-2500 cal BC) from the Zijderveld macro-region. In the first place, this should be attributed to low research intensity, but this still leaves unexplained why in the various Zijderveld excavations (see section 4.2) no undisputable Late Neolithic remains have been found. A plausible explanation may be that the sedimentation of the Schoonrewoerd fluvial system, situated only 500 m to the southeast, rendered habitation unfavorable until the cessation of sedimentation by the Schoonrewoerd fluvial system prior to or around *c.* 2460-2140 cal BC.[34] After the cessation of sediment deposition, the accumulation of Zijderveld- and Schoonrewoerd levee- and crevasse deposits was in theory available for use, but no remains have been documented for the Bell Beaker phase within the Zijderveld excavations. Possibly, sedimentation by the Schoonrewoerd system covered the preferred (more sandy to silty) locations beyond what acceptable for either living or agriculture. Alternatively, the slightly higher Schoonrewoerd levee- and crevasse deposits may simply have been preferred. Some support for the latter option can be found downstream of the Zijderveld macro-region, where several sites on the Schoonrewoerd deposits that have been test-trenched or excavated, yielded remains datable to the Late Neolithic. These sites yielded a few possible All Over Ornamented (Single Grave Culture period) and Maritime Bell Beaker sherds, but most beaker sherds could be interpreted as originating from Bell Beakers.[35] This suggests a rapid usage of the Schoonrewoerd levee deposits after the cease of fluvial activity.

At both the Enspijk (section 4.3.3) and Eigenblok (section 4.3.4) excavations, sherds datable to the Late Neolithic were found. The single groove-decorated sherd from Enspijk can not be dated more precisely than 'Late Neolithic, possibly Bell Beaker' (Ter Wal 2005b, 27; 29 fig. 16.2). While this fragment does prove that the period of fluvial activity suggested for the Hooiblok/Enspijk fluvial system(s) on which the site is located may be wrong (*c.* 2500-2200 BP; Berendsen & Stouthamer 2001, 199; 208), it only provides a *terminus ante quem* for the actual age of this branch of the Hooiblok-Enspijk system.[36] It is possible that the Enspijk fluvial system linked up downstream to the Eigenblok fluvial system (Van Zijverden 2004b; Appendix II, fig. II.2). For this system, cessation of sedimentation prior to or around *c.* 3340-2930 cal BC is likely.[37] On the levee and crevasse splay deposits of the Eigenblok fluvial system, a vegetation horizon formed (Van Zijverden 2002a, 60 fig. 2.7). No direct or indirect dates are available that can more precisely date the formation of this vegetation horizon. A date from the residual crevasse gully that later eroded parts of this finds-layer only indicates that this occurred well before *c.* 1920-1680 cal BC.[38] The few (n = 24) possible Bell Beaker sherds recognized at the Eigenblok excavations cannot be dated more precisely and were all found in secondary context (*i.e.* the upper, Bronze Age, occupation layer; Bloo & Schouten 2002, 265). It is probable that at both Enspijk and Eigenblok, Late Neolithic activities (of indeterminate nature) took place only centuries after cessation of the underlying fluvial system.

From the greater diversity and quantity of Late Neolithic artefacts from the various De Bogen excavations (section 4.4.3; Appendix III) it is clear that Late Neolithic occupation must have differed in nature here compared

34 See Appendix I and Van Zijverden 2003a for a detailed discussion on the proposed end-dates for the Schoonrewoerd fluvial system.

35 Louwe Kooijmans 1974, fig. 18 and his appendix III; Wassink 1981, 59 (although for a few cord-decorated sherds an interpretation as AOC-pots cannot be excluded; *e.g.* Wassink 1981, photo 15, top right); Deunhouwer 1986, 101; Thanos 1995, 58 table 8.2. At Molenaarsgraaf, Bell Beaker pottery is the oldest pottery recovered (Louwe Kooijmans 1974, 209-210), although some smaller fragments may be parts of AOO beakers (*op. cit.*, 287).

36 Moreover, the exact context (feature, finds-layer, levee deposits?) of the sherd was not published.

37 GrN-24265: 4450 ± 40 BP; Berendsen & Stouthamer 2001, 199.

38 AA-37254: 3475 ± 45; Jongste 2002a, 36. Another indirect indication is provided by the charcoal from a pit situated within the ring-ditch at Eigenblok site 5 dated to *c.* 2300-1750 cal BC (GrN-24100: 3660 ± 80 BP; Jongste 2002a, 35).

to that at Eigenblok and Enspijk. At the De Bogen sites, many sherds and lithic remains were dated to the Late Neolithic.[39] These finds were generally embedded in a vegetation horizon that had formed in a layer of (Middle Neolithic; *supra*) crevasse deposits that overlaid older levee- and crevasse splay deposits (Van Zijverden 2002b, 78; 2004b). The oldest Late Neolithic remains from the De Bogen macro-region may be the possible All Over Corded sherds from De Bogen site 30 (Jongste & Smits 1998, 28; 31), similar sherds found with Vlaardingen period sherds at Geldermalsen - Nieuwe Provinciale Weg (Hulst 1973, 28; 1975c, 81)[40] and a possible type P2 battle-axe (Addink-Samplonius 1968, 233) and a possible Protruding Foot Beaker sherd (De Jager 1996, 13) from Meteren - Kalenberg.[41] These finds indicate that Single Grave Culture period activities may be expected, but cannot yet be isolated and understood in detail.[42]

It is not until the All Over Ornamented (*c.* 2600-2500 cal BC) and Bell Beaker period (*c.* 2500-2000 cal BC) phases that human activities have left clearer traces. Comparable to the situation at the Eigenblok macro-region, a time lag of several centuries may have lapsed between the cessation of fluvial activity and more intensive human activities in the De Bogen macro-region. Alas, the exact nature and duration of these latter activities escape us. The presence of the claimed Late Neolithic structures at De Bogen site 29, 30 and 45 (Hielkema, Brokke & Meijlink 2002) has been refuted in this study (section 4.4.3; Appendix III), which means that finds and features cannot easily be studied in meaningful interrelation. Moreover, no areas or stratigraphically separated levels were found where Late Neolithic remains could have been studied in isolation from younger period occupation traces. Consequently, the various fragmentary – yet vivid – relicts such as artefacts and some remarkable features (*cf.* Chapter 4, fig. 4.21, C) cannot be characterized more precisely than as 'human activities'. They may very well represent habitation, but the duration and nature thereof remains unknown.

For the Wijk bij Duurstede macro-region, only few indications for Late Neolithic use are known. While it is plausible that deposits of the Werkhoven fluvial system were suitable for human use after the avulsion into the Houten fluvial system around *c.* 2460-2040 cal BC (Berendsen & Stouthamer 2001, 209), few tangible remains thereof have been uncovered. Weak indications are provided by the radiocarbon dates for a vegetation horizon (Steenbeek 1990, 67; Appendix IV), features observed in trench sections below the level of the Bronze Age occupation (Appendix IV), recovered flint artefacts (Letterlé 1985, 335) and Late Neolithic features and pottery described in passing remarks (Hessing & Steenbeek 1990, 16; Hessing 1994, 226).

At Lienden, a few late Bell Beaker sherds were recovered from a vegetation horizon that formed in the lowermost crevasse deposits of the adjacent Westerveld fluvial system (Siemons & Sier 1999b, 23-25). Unfortunately, this fluvial system is not dated directly, and the Bell Beaker sherds form only a *terminus ante quem* date. It seems however probable that the Westerveld fluvial system remained active during the Late Neolithic, as a second phase of crevasse formation underlies later Bronze Age occupation (Van Dinter 2002, 50; Appendix V).[43] At present, the data from Lienden cannot be used to determine whether the Bell Beaker activities (which may have included the digging of postholes; Siemons & Sier 1999b, 19) took place shortly after the start of sedimentation by the Westerveld fluvial system or not.

From the data obtained in the Dodewaard macro-region, it is clear that crevasse splay deposits in the vicinity of active fluvial systems were (intensively?) used during the Late Neolithic (Appendix VI). There, on several

39 On the ceramics see Ufkes 2001; Ufkes & Bloo 2002, on the lithic remains see Niekus, Van Gijn & Lammers 2001; Niekus & Huisman 2001; Niekus *et al.* 2002; Van Gijn *et al.* 2002.

40 A sherd with three rows of spatula impressions in herringbone pattern was found as well, which could be part of a Single Grave Culture period Protruding Foot Beaker (type 1d) or an All Over Ornamented beaker (type 2IIc; for types see Van der Beek & Fokkens 2001, 302 fig 1).

41 For the typochronological dating of battle-axes see Butler & Fokkens 2005, 394-395; Drenth 2005, 349.

42 A dated sample of charcoal from a house typologically dated to the Middle Bronze Age (house 30DH) yielding an age of *c.* 3330-2890 cal BC (AA-37516: 4390 ± 55 BP; Meijlink 2002a, 47) provides a weak *terminus ante quem* for the creation of the underlying crevasse splay and may simultaneously provide a weak indication of human activities during the first (Single Grave Culture-period) part of the Late Neolithic.

43 Berendsen & Stouthamer (2001, 207; 243) assume that the Homoet-Kamp fluvial system formed the upstream connection to the Westerveld system situated 9 km to the west. For the former, a residual gully date of *c.* 1740-1420 cal BC has been obtained (*op. cit.*, 170), which confirms the continued activity from the Late Neolithic into the Bronze Age for the Westerveld fluvial system.

crevasse splay deposits – for which it was not clear from which fluvial system(s) they originated[44] – Late Neolithic ceramics, stone tools and some possibly associated features have been discovered.[45] All sites are situated within 900 m from an active fluvial system (Appendix VI, fig. VI.4). Generally, the remains recognized concern Bell Beaker ceramics, which are mostly found mixed with younger (Bronze Age) period features and finds.[46] Only at two sites in this macro-region that were test-trenched prior to the Betuweroute railway construction, did Late Neolithic finds and features occur without later activities at the site.[47] At Dodewaard - site 24 a possible hearth and a posthole were found, but the surface area of the site may have been disturbed by later fluvial erosion (Bulten & Smits 1998a, 12-13). This site appears to be situated at the transition of more sandy-clayey crevasse deposits towards more silty-clayey floodbasin deposits. Some archaeological remains were found incorporated in the floodbasin deposits, which again suggests fluvial erosion (Van Zijverden in Bulten & Smits 1998a, 21-27). At Dodewaard - site 23, a thin finds-layer was uncovered at the (vertical) transition between crevasse-splay and (covering) floodbasin deposits (Jongste 1998, 8-16). Underneath this finds-layer, that contained most Bell beaker and Potbeaker sherds (Jongste 1998, 39), two postholes and a pit were uncovered. This site too may have been affected by fluvial erosion, as possible washed-in finds were noted and the remaining thickness of the finds-layer (*c.* 15 cm) was limited (Jongste 1998, 10-12). The absence of well-developed vegetation horizons, combined with the indications for fluvial erosion and the knowledge that several large fluvial systems were active in the Dodewaard macro-region during the Late Neolithic, supports the proposed view of Bell Beaker period activities taking place on crevasse-splay deposits, and possibly on floodbasin deposits overlying them, that were (incidentally or periodically) affected by active fluvial systems.[48] Again, the nature of these activities remains unclear.

Late Neolithic sites in the study area: special activity sites or settlement sites?

There is a stark contrast between the number of Late Neolithic find-spots known from the study area and the amount of information on settlement dynamics obtainable from them. Generally, the find-spots consist of typologically better datable stone artefacts (*i.e.* (battle)axes, plano-convex knives, flint daggers), ornaments (v-perforated buttons) or pottery displaying beaker types of decoration) that were found amidst debris from other – usually Middle Bronze Age – periods. The number of sites where Late Neolithic finds and/or features could be studied in relative isolation is very limited. While at some sites features stratigraphically pre-date the Bronze Age, there is generally no indication of their exact age. Consequently, only very few features can be dated to the Late Neolithic based on incorporated finds or radiocarbon dated samples, and structures such as outbuildings and houses have not been identified with certainty yet. How does this compare to the regions directly outside the study area?

For the area outside the study area, a comparable image can be drawn. While many find-spots are known from various geogentic regions and barrows datable to the Late Neolithic are known in some numbers, settlement sites are less apparent.[49] Whereas some Single Grave culture period settlement sites in West-Friesland have seen more extensive research,[50] excavated settlement sites from this period in other regions and Bell Beaker period settlement sites in general are few in number. This is not to say that no Bell Beaker settlement sites have been excavated at all, but that the number of sites where the Bell Beaker-period habitation seems to have been the only or dominant occupation phase, is low. For instance, the several more extensively researched Bell Beaker period sites found on

44 Some *terminus ante quem* indication for the start of crevasse formation may be offered by the radiocarbon dated fragment of charcoal at site 24 (Valburg - Vergulde Bodem; Asmussen 1994, 46-49; Bulten & Smits 1998a) which yielded a date of *c.* 3090-2890 cal BC (UtC-3108: 4360 ± 40 BP; Asmussen 1994, 47).

45 Appendix VI, fig. VI.5; Ten Anscher & Van der Roest 1997; Bulten 1998b-c; Theunissen & Hulst 1999a, 140; 150; Schutte 2003.

46 No older beaker styles can be identified with certainty; Appendix VI and references therein.

47 Dodewaard - site 23; Jongste 1998 and site 24; Bulten & Smits 1998a.

48 A similar conclusion (Late Neolithic activities on active fluvial systems) may also hold true for sites such as Maurik - Meerboomweg and Kerk-Avezaath - Burensedijk (Arnoldussen 2000, 37-38 inventory nos. 17 & 70), which both yielded cord-decorated (Single Grave Culture or All Over Corded period?) ceramics and are both likely to be associated with the crevasse- or levee deposits of the Zoelen channel for which a start of sedimentation around *c.* 3100-2900 cal BC is probable (UtC-6846: 4376 ± 37 BP; Berendsen & Stouthamer 2001, 248).

49 Drenth & Hogestijn 1999; Drenth 2005; Drenth & Lohof 2005.

50 *E.g.* Van der Waals 1989a; Hogestijn, Bulten & Koudijs 1994; Van Ginkel & Hogestijn 1997; Van Heeringen & Theunissen 2001a-c; Drenth 2005, 353.

the Schoonrewoerd levee- deposits that have been published by Louwe Kooijmans (1974), have all yielded remains from younger periods. This complicates the interpretation of settlement nature and settlement dynamics for the Bell Beaker period, as the sites represent a palimpsest of features and finds caused by later activities (often at the same stratigraphic level). For example, at Ottoland - Kromme Elleboog, Bell Beaker, Barbed Wire-stamp decorated and Hilversum-style decorated sherds were found (Wassink 1981, 59). For the possible house plan (Chapter 5, fig. 5.4, no 2) and tentative four-post outbuilding from this site (Wassink 1981, fig. 56; 59), an Early Bronze Age date cannot be excluded as pits 'associated with' the houses yielded both Bell Beaker and Barbed Wire-stamp decorated fragments (*op. cit.*, 19).

At the nearby site Ottoland - Oosteind, a post-alignment of which one feature yielded a potbeaker sherd, may represent yet another Late Neolithic or Early Bronze Age house plan.[51] For this site as well, occupation remains from the Early-, Middle and Late Bronze Age are likely to occur interspersed (Deunhouwer 1986, 101-150). At Molenaarsgraaf, two house plans were reconstructed, for which a Late Neolithic to Early Bronze Age date may be assumed based on the indirectly associated ceramics from the site.[52] As it has been argued above that sedimentation by the Schoonrewoerd fluvial system on whose levee deposits these three sites are situated is likely to have ceased around 2400-2100 cal BC (*supra*), their presence suggests that inactive river courses may have been utilized almost instantly there. This was, however, not always the case.

The available data and dates for Late Neolithic activities on the levee- and crevasse deposits in the Eigenblok macro-region and the crevasse deposits in the De Bogen region indicate that between cessation of fluvial activity and the first human activities, a time lag of two to five centuries may have occurred (*supra*). Alternatively, the data obtained in the Dodewaard macro-region indicate that crevasse-splay deposits were used for human activities at a time when the fluvial systems responsible for their formation (and/or other fluvial systems within a kilometer distance), were still active.

Having outlined that active, recently inactive and long fossil systems could equally well harbour Late Neolithic activities, the nature and duration of these activities has yet to be determined. The diversity and quantity of the finds and features uncovered at Ottoland, Molenaarsgraaf and Valburg (for references see above) suggests a use as a settlement site, although houses have not (yet) been discovered or could not be dated to the Late Neolithic with certainty.

For Valburg - De Vergulde Bodem zuid, the small spatial extent (*c.* 60 by 40 m) and limited numbers of features and finds recovered were used to propose a function as a special activity site (Bulten & Smits 1998a, 16). Considering the small area uncovered in the test-trenches and the possibility of later fluvial erosion, the number of recovered artefacts is perhaps not that low.[53] This assemblage may very well reflect the (partially eroded) debris of a settlement, and the proposed interpretation as an animal butchering and animal product processing-site seems rather far-fetched.[54] The small (?) size suggested by the coring campaign (Asmussen 1994, 46 fig. 12) may be much more related to the morphology of the underlying deposits combined with differential taphonomic processes (*i.e.* fluvial erosion) than related to past human behavior. Consequently, this small size should not be used as an argument supporting claims of it being a special activity site.

The nearby site Valburg - Zettensche Veld Oost (situated *c.* 100 m more westerly) is comparable in geological terms, taphonomy and nature of the archaeological remains discovered. For this site, by contrast, an interpretation as a settlement site was forwarded (Jongste 1998, 16). This more plausible interpretation also applies to Valburg - De

51 Chapter 5, fig. 5.4, no 7; Deunhouwer 1986, 36 & fig. 12.

52 Louwe Kooijmans 1974, 169-339; 1993, fig. 6.10, nos. 3-4; section 5.2.1, fig. 5.2, A-B.

53 In total, 698 sherds (*c.* 1 kg), 94 flint objects (*c.* 360 g), 61 stones (*c.* 1 kg) and 287 bone fragments (*c.* 450 g) were recovered for the Late Neolithic phase from *c.* 168 m^2 (Bulten & Smits 1998a, esp. 8; 12-13).

54 While this interpretation is not supported by the remains uncovered, one might wonder whether the presence of many sherds of (often large) ceramics vessels (Bulten & Smits 1998a, 13 fig. 6), polished axe-flakes and a flint arrowhead (*ibid.*, 13-14) do not even argue *against* a dominant or exclusive function of this site as a special (animal processing) activity site.

Vergulde Bodem zuid, and possibly also to other sites in the Dodewaard macro-region.[55] The above observations suggest that the 'special activity sites' assumed for the Bell Beaker phase of the Late Neolithic (*supra*; Louwe Kooijmans 1993a, 94; 99) are not easily identifiable or even archaeological constructs, instead of well-documented phenomena for this period.[56] Moreover, it is unclear whether the scarcity of clear-cut special activity sites, besides known (near-) coastal Single Grave Culture period examples, should be explained in terms of chronology (*i.e.* they are predominantly a Late Neolithic-A feature), geography (*i.e.* they are predominantly a (near-)coastal feature), or both.

Late Neolithic sites in the river area: the distribution of Single Grave Culture period finds

At first glance, it seems that typical Single Grave Culture ceramics (Protruding Foot Beakers), are absent from the study area, confirming the view that it was not until the All Over Ornamented phase (*c.* 2600-2500 cal BC) that the river area was added to the former Single Grave Culture distribution areas. It should, however, be kept in mind that the fragmentation of pots into the small sherds generally recovered from settlement sites may have decreased recognition.[57] The fact that larger pot profiles – which show the undecorated lower bellies typical for Protruding Foot Beaker – are necessary to distinguish between All Over Ornamented and Protruding Foot Beakers, implies that Protruding Foot Beakers are presently underrepresented. Moreover, pots from the All Over Ornamented phase share decorative techniques, motifs and decoration locations with the Protruding Foot Beaker vessels, which means that for cord- or herringbone pattern decorated fragments a decisive interpretation can only be made if the lower pot section is preserved.[58]

Several find-spots of Protruding Foot Beaker sherds or stone implements attributed to the Single Grave culture period are known from the regions south of the present-day river Rhine. While digging a drainage ditch at Almkerk, sherds from All Over Ornamented beakers were found (Louwe Kooijmans 1968, 124; 1974, 345, possibly also Protruding Foot Beaker sherds). At Wijchen - De Homberg, several sherds decorated with cord impressions and spatula impressions in herringbone pattern were uncovered (Jansen & Tuyn 1978, 244 fig. 8). During fieldwalking at Siebengewald,[59] sherds decorated with herringbone patterns were found and at Swalmen - Bosheide, two Protruding Foot Beakers were found during barrow excavations (fig. 7.4, C; Lanting & Van der Waals 1974; 1976, 7 fig. 3).

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55 See Appendix VI, fig. VI.5. Site Valburg - Zettensche Plas (22; Jongste & Ten Anscher 1998) may represent the periphery of a settlement site (datable to the Middle Bronze Age-A/B?), as here many (washed?) finds but no postholes or pits were uncovered (*contra* Jongste & Ten Anscher 1998, 17). At the neighbouring site Valburg - Zettense Veld west (21; Ten Anscher & Van der Roest 1998), a similar situation occurred. There, Bell Beaker and Barbed Wire-stamp decorated sherds were found together with flint, stone and bone fragments and despite several arguments to the contrary (*ibid.*, 18), interpreted as special activity sites dated to both periods (*loc. cit.*). The authors may have put too much weight on their interpretation of the spatial distribution (Arnoldussen 2000, 90) and the interpretation of neighbouring sites which are all based on test-trenches of limited size and wide inter-trench distances (see Appendix VI, section II).

56 The references stated by Louwe Kooijmans (1993a, 94) for examples of Late Beaker special activity sites must be viewed critically. First, Woltering (1985a, 214) states that sites existed that were discontinuously occupied, but does not refer to a more specialized functional nature for these. Second, while the distribution of Bell Beaker ceramics at Vlaardingen is spatially confined (Van Beek 1990, 173-174 fig. 95), they originated from a layer also containing Vlaardingen-period ceramics, flint and stone fragments and (burnt) bone (Van Beek 1990, 173-183). This cluster is at one point interpreted by Van Beek as a possible house-site (1990, fig. 95), and at another as reflecting more short-lived activities (*op. cit.*, 250). Only for the smaller (spatially distinct) concentrations that formed the late Vlaardingen to Beaker period use-phase of Hekelingen III (Louwe Kooijmans & Van de Velde 1980, 10-12), can a distorting role of methodology and taphonomy be dismissed to explain the limited spatial extent and numbers of features.

57 For instance, the cord-decorated fragments recovered at Ottoland - Kromme Elleboog, De Bogen site 30, Maurik - Meerboomweg or Kerk-Avezaath - Burensedijk, or the sherds with herringbone pattern from Geldermalsen - Nieuwe Provinciale Weg, Meteren - Kalenberg, Molenaarsgraaf and Hekelingen III may have been part of All Over Ornamented or Protruding Foot Beakers (Ottoland - Kromme Elleboog: Wassink 1981, photo 15; De Bogen site 30: Jongste & Smits 1998, 31; Maurik - Meerboomweg and Kerk-Avezaath - Burensedijk: Arnoldussen 2000, 37-38; Geldermalsen - Nieuwe Provinciale Weg: Hulst 1973, 28; 1975c, 81; Meteren - Kalenberg: De Jager 1996, 13; Molenaarsgraaf: Louwe Kooijmans 1974, 287; Hekelingen III: Louwe Kooijmans & Van de Velde 1980, 13).

58 Which also affects the interpretation of the claimed AOC sherds from Geldermalsen - Middengebied (Hulst 1994, 72), Maurik - Hornixveldweg (Arnoldussens 2000, 40), Broekhuizen (Archis 15591) and Linnen (Archis 4285). For an introduction to the pottery see Drenth 2005; Drenth & Hogestijn 2006.

59 Verscharen 1988; Stoepker 1989, 174; Archis 17482.

Additionally, stray finds such as fragments of daggers made from *Grand Pressigny* flint are known from the southern Netherlands.[60] Such daggers date to *c.* 2650-2400 cal BC and are frequently found in graves in association with (late?) Protruding Foot Beakers and All Over Ornamented vessels.[61] At Sevenum - Reindonk, half a type P1 battle axe was found as a stray find (Bloemers 1973). Another battle axe (type Glob F3) was recovered at Beesel - Turfheide (Willems 1983, 205-206).[62] Both are presumably relatively late Single Grave Culture period axes (Drenth 2005, 349).

To sum it up, the distribution of clear-cut Protruding Foot Beaker ceramics is at present predominantly confined to the coastal barriers and the Pleistocene areas north and north-east of the present-day river Rhine. Nonetheless, a few find-spots of Protruding Foot Beaker ceramics are known in the south (*e.g.* Swalmen and Wijchen). It is frequently difficult to distinguish between Protruding Foot- and All Over Ornamented Beakers for smaller sherds.[63] Near the end of the Protruding Foot beaker phase and start of the All Over Ornamented phase of the Late Neolithic-A, contacts seem to more often – at least archaeologically – span the river area, as (late) Single Grave Culture period axes and flint (*Grand Pressigny*) daggers are known in some numbers from the sandy areas to the north as well as to the south of the Rhine river. All Over Ornamented Beakers may have had their widest distribution during this period (*c.* 2650-2400 cal BC).

Late Neolithic settlement dynamics in the study area: a conclusion

For the Late Neolithic periods, a paradoxical situation exists. While ceramics and stone artefacts are known from most macro-regions – and sometimes in considerable quantities – the contextual information available for them is very limited. No extensively excavated settlement sites are known within the study area where Late Neolithic features and finds could be studied in relative isolation. At nearly all sites, Late Neolithic remains are found either void of context or mixed with younger period settlement site debris. Pottery fragments from the first part of the Late Neolithic (Protruding Foot Beaker- and All Over Ornamented phase) are respectively absent to scarce. Yet, the typical Bell Beaker pottery seems

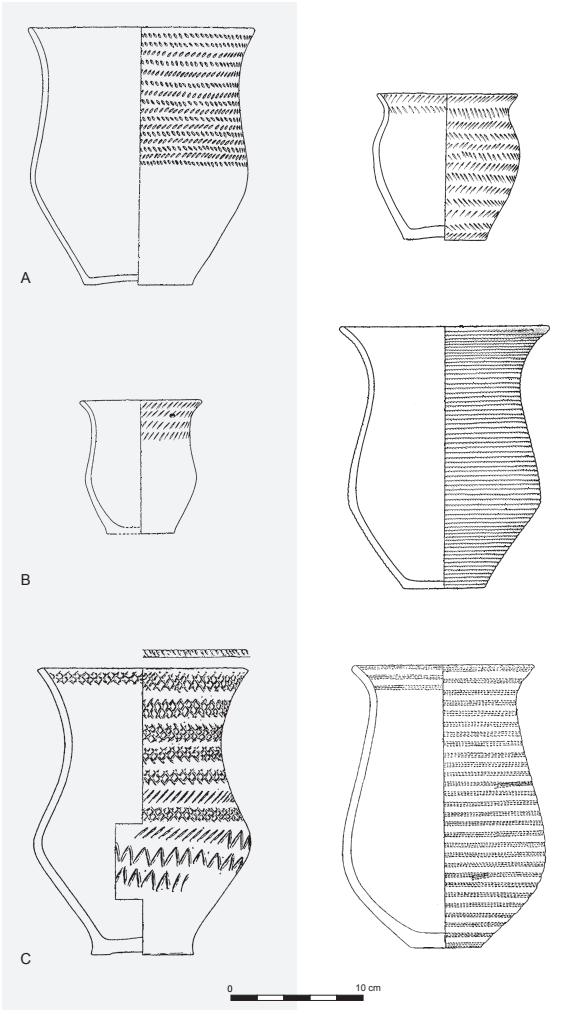

Fig. 7.4 Examples of Protruding Foot Beakers (left) and All Over Ornamented Beaker pots (right) from Soesterberg - Tumulus 3 (A; after Lanting & Van der Waals 1976, 18 fig. 8), Emst-Hanendorp - Tumulus 2 (B; after Lanting & Van der Waals 1976, 19 fig. 10) and Swalmen – Bosheide Tumulus 6 (C; after Lanting & Van der Waals 1974, fig. 12). See Drenth 2005, esp. 337 fig. 3, for an overview of the Single Grave Culture period pottery traditions.

60 *E.g.* Kaatsheuvel - Bernsehoef (Van der Lee 1970, 20), Boekel - Molenwijk (Hulst 1965c, 43), Groesbeek - Klein America (Archis 7536), Kesseleijk (Franssen 1982), Beek en Donk (Polman 1993, 14), Meerlo (Brounen 1998), Venray - Overbroek (Archis 29639), Zundert (Dijkstra & Peeters 1983), Heeze - Leenderheide (Archis 30534), Kessel (Wouters 1981), Bergeijk (Beex 1957; Kakebeeke 1971), Loon op Zand (Van der Beek 1993, 54), Rijsbergen (Beex 1959, 17) or Heythuysen (Roymans 2004; Archis 406791).

61 Lanting & Van der Waals 1976, 14 table II; Drenth 1990; 2005, 338; 349.

62 A type R/P1 battle axe was found at Echt - Slufferd, but this has not been published yet (Archis 4344*, cf.* Archis 15642).

63 Note that all examples (A-C) in fig. 7.4 were found in graves, indicating the undoubtable association of PFB and AOO decorative traditions, which is claimed to be rare according to Van der Beek (2004, 164). It does also underline the risk that sherds interpreted as All Over Ornamented beakers may in fact be (contemporaneous to) partly earlier Protruding Foot Beakers.

to occur more widespread. Considering the low overall numbers, and low quality of presently known Beaker period sites, this differential occurrence is hard to interpret. Several explanations of equal, and indeterminate, validity may be forwarded.

First, the limited geographic distribution and confined spatial extent of the excavations executed in the study area simply missed settlement site locations for these periods.[64] Such an explanation would imply that settlement site locations may have differed for the start and final phase of the Late Neolithic, as remains from the latter part *are* known in some numbers. Second, the observations for the Lienden and Dodewaard macro-regions suggest that crevasse-splay deposits next to active fluvial systems were used during the Bell Beaker period. If during the first part of the Late Neolithic-A similar locations were chosen, these sites were prone to more fluvial erosion and/or sediment covering, which could decrease their archaeological visibility. It would however seem probable that the Bell Beaker period sites were affected equally, which appears not to be the case. Finally, the role of fluvial dynamics must be considered. At first glance, a reasonably similar situation seems to exist for the Late Neolithic-A and Late Neolithic-B, if judged by the number of fluvial systems emerging, active and becoming inactive (*cf.* fig. 2.13; Berendsen & Stouthamer 2001). Few fluvial systems, however, become inactive directly prior to the Late Neolithic-A,[65] and the ones that do so have seen little archaeological research.[66] In addition, for some of the more extensive fluvial systems that became inactive, nearby systems remained active or became active relatively soon thereafter.[67] This may have limited human usage of these fossil systems.

The interpretation of the settlement dynamics for this period is hampered by the scarcity of well-preserved and single-phased sites. While fossil levee and crevasse splay deposits and crevasses of – or next to – active systems were used, the nature and duration of such usage remains unknown. The diversity and sometimes quantity of the artefacts recovered do however hint at domestic use of some of such sites. Remarkably, other site types like smaller extraction-, processing- or hunting camps are commonly assumed for these periods, but have not yet been discovered for this region and period under study. One might speculate whether the assumped presence of such sites does not in the first place derive from preconceived notions of what 'proper' Late Neolithic life-styles and settlement dynamics should be like (*cf.* fig. 7.2). In any case, following an inductive approach there is little evidence to indicate the presence of such site types in the study area.

7.2.3 Early Bronze Age sites and site types in the Dutch river area

7.2.3.1 The Early Bronze Age

The start of the Early Bronze Age is traditionally related to the introduction of two new categories of artefacts: the name-giving bronzes and pottery decorated with 'Barbed Wire'-stamp impressions.[68] This introduction need not have suddenly or dramatically changed the nature and dynamics of settlement sites, and the implications of these technological changes in the domain of settlements is best not overstated (Fokkens 2001, 255). Fokkens has stressed

64 Additionally, pottery datable to *c.* 2900-2500 cal BC from the river area may be hard to identify if it was characterized by decorative traditions not akin to those elsewhere or traditions that differed little from preceding and ensuing periods. There is presently no evidence, however, to suggest that this was the case.

65 *E.g.* Andel/Molenveld/Zaltbommel-Nederhemert or Blokland-Snelrewaard; Berendsen & Stouthamer 2001, 193; 246. See also Chapter 2, fig. 2.16.

66 The period of activity of the Blokland-Snelrewaard fluvial system is well-bracketed by radiocarbon dates to *c.* 3340/2920 cal BC for the start and *c.* 2880/2490 cal BC for the cessation of fluvial activity (Berendsen & Stouthamer 2001, 193). Later fluvial activity has presumably not eroded much of this system's deposits, suggesting that preservation conditions may be good. Specific archaeological research of this system may yield high-quality information on Single Grave Culture period activities on active fluvial systems and usage of fossil systems for later periods. The Schaik system (see note below), may offer a similar potential for the study of Bell Beaker period sites.

67 For instance, the usability of the Schaik fluvial system (fossil around *c.* 2930-2630 cal BC; Berendsen & Stouthamer 2001, 233), may have been affected by the continued sedimentation of the nearby Schoonrewoerd system (*ibid.*, 233-234). A similar situation may have occurred in the south of the central river area, when the Andel/Molenveld/Zaltbommel-Nederhemert system may have been quickly brought under influence of sedimentation by the nearby Biesheuvel-Hamer/Hedel-Wordragen fluvial system, which became active around *c.* 2630-2460 cal BC (*op. cit.*, 204).

68 Anonymous 1967, 9; Lanting & Mook 1977, 6; 97; Fokkens 2001; Fontijn 2003, 56-57.

the fact that in pottery traditions, burial customs and presumably settlement data a continuity between the Late Neolithic and the Early Bronze Age can be outlined (Fokkens 2001, 258, following Lanting 1973). This could indicate that settlement dynamics also changed little between these two periods and I have already argued earlier (*cf.* fig. 7.1) that some models proposed for Early Bronze Age settlement dynamics differ only marginally from those used for the preceding (Late) Neolithic phases.

In Chapter 5 (section 5.2.1) I have shown that Early Bronze Age houses in the Low Countries exemplify a building tradition that may prove hard to distill from more dense post-concentrations, suggesting that these are frequently likely to remain undetected. Indeed, only very few Early Bronze Age houses are known, despite the fact that the distinctive Barbed Wire-stamp decorated pottery is frequently found during excavations of later-period settlement sites.[69] This problem of recognizing Early Bronze Age houses also affects additional interpretations of the nature and dynamics of the settlement sites for this period. For instance, granary-type outbuildings do not seem to have been a common element of settlement sites until the Middle Bronze Age-B (Chapter 5, section 5.4).[70] While fence lines and palisades may date to the Early Bronze Age, they do not appear to define or delimit Early Bronze Age house-sites or settlement sites (Chapter 5, section 5.5).[71] Essentially, while Early Bronze Age houses can be outlined in a few specific cases, the evidence from those sites (*i.e.* direct observations) and from other sites with 'stray' Early Bronze Age remains (*i.e.* indirect argumentation) indicates that during the Early Bronze Age, little structuring of the house-environment can be identified.[72] During the Early Bronze Age, house-site structuring did evidently not matter in the same way, was not standardized, or depended on principles with poor archaeological visibility.

While it is tempting to link this interpretation of the nature of Early Bronze Age settlement sites to that of the preceding Late Neolithic period, similarities remain to be proven. The fact that for both periods the structure of settlement sites is unclear, and that houses can only be outlined with great uncertainty, does not prove that the nature of settlement sites or settlement dynamics were comparable. A similarly incomprehensible outcome may very well hide distinctly different genetic processes. Therefore, the Early Bronze Age find-spots in the study area will be discussed to see whether, and how, they differ from those of the preceding Late Neolithic period.

7.2.3.2 Early Bronze Age sites in the study area

At Culemborg - Lanxmeer in the Zijderveld macro-region, some Barbed Wire-stamp decorated sherds and a charcoal sample radiocarbon dated to the Early Bronze Age were recovered from a feature interpreted as a hearth (Huis in 't Veld 2004, 13; 27).[73] This site is situated at the location of the large crevasse splay between the (active) Hennisdijk and (fossil) Schoonrewoerd fluvial systems (Appendix I, fig. I.7). Although it cannot be determined whether the Schoonrewoerd or the Hennisdijk system deposited these crevasse sediments, the latter was in any case active and situated only 700 m east of the site. Floodbasin deposits of the Hennisdijk fluvial system appear to cover the early Bronze Age remains (Huis in 't Veld 2004, 29). That the levee deposits of the Schoonrewoerd system were in use by this time is indicated by the Barbed Wire-stamp decorated sherds found in secondary context at Culemborg - Den Heuvel (Arnoldussen & Van Zijverden 2004, 66).

Downstream of the Zijderveld macro-region, several other sites located on top of the Schoonrewoerd levees have yielded (Bell Beaker and)Barbed Wire-stamp decorated sherds.[74] At Molenaarsgraaf and Ottoland - Kromme Elleboog, Bell Beaker and Barbed Wire-stamp decorated sherds were equally well-represented (Thanos 1995, 58-

69 Modderman 1955c; Lanting 1969; 1973. The available radiocarbon dates suggest that pottery decorated with 'Barbed Wire'-stamps was current between *c.* 2060-1630 cal BC, although this date range is in need of more high-quality dates. See for direct dates: Gehasse 1995, 113-114; Lanting & Van der Plicht 2003, 175 and for other dated samples with reasonable – albeit indirect – association: Huis in 't Veld 2004, 11; Deiters 2004, 502; Van Heeringen, Van der Velde & Van Amen 1998, 38-43; Waterbolk 1960, 74; Lanting & Mook 1977, 97; Butler, Lanting & Van der Waals 1972, 230; Lanting 1973, 245.

70 See for some claims Chapter 5, note 253 and references therein and Appendix II, figs. II.5 and II.7.

71 See for instance the claimed Early Bronze Age fence-line at Noordwijk (Van Heeringen, Van der Velde & Van Amen 1998, 15 fig. 5; Van der Velde 2008) and the palisades at De Bogen sites 29 and 30 (Hielkema, Brokke & Meijlink 2002, 157; 185).

72 Particularly if compared to that of the Middle Bronze Age-B (Chapter 6; Arnoldussen & Fontijn 2006, 299-301).

73 Charcoal (unspecified wood species) dated to *c.* 2020 - 1760 cal BC (GrA-27104: 3555 ± 40 BP; Huis in 't Veld 2004, 11).

74 Louwe Kooijmans 1974, esp. fig. 18; Wassink 1981; Deunhouwer 1986.

59 table 8.3).[75] This may indicate that these sites were used with comparable intensity (nature, duration) during both periods. Thus, from the fact that the features cannot be disentangled and separated into distinct Late Neolithic and Early Bronze Age phases of use, important observation can still be made. First, it indicates that during both periods, identical locations were used. Second, it is clear that these were places that were not affected by direct fluvial sedimentation because of (1) their remote location from active fluvial systems and/or (2) by their relatively high topographic positions. Otherwise, sedimentation would or could have created separate stratigraphic levels. Third, the seemingly uniform appearance of the finds-distributions and feature configurations also conveys the impression that general settlement site use and the use of post-built structures did not differ categorically between the two periods. While preservation conditions allowed for distinctly different post-configurations – representing structures from different periods – to be preserved, this was hardly the case. This is not to say that *no* variation can be outlined. Quite the contrary may have been the case, as is also suggested by the different aspect of the tentative houses claimed for Molenaarsgraaf (Chapter 5, fig. 5.2, A-B), Ottoland - Kromme Elleboog (Chapter 5, fig. 5.4, no 2) and Ottoland - Oosteind (Chapter 5, fig. 5.4, no 7) that all cannot be dated more precisely than 'Late Neolithic or Early Bronze Age'. It is exactly this *variation* that seems to typify settlement site elements for these periods. Perhaps the bandwidth of allowed variation was comparable for the Early Bronze Age and Late Neolithic settlement site elements, rather than that specific structures were of comparable (super)structure. Without significantly large excavated areas of limited time-depth, such argumentation is however difficult to uphold or falsify and has little to offer to the interpretations of the frequently isolated finds from the several macro-regions in the study area.

Few Early Bronze Age finds are known from the Eigenblok macro-region, despite the extent of the excavations at Enspijk - A2 (*c.* 0.5 ha; Ter Wal 2005b, 11) and Rumpt - Eigenblok (*c.* 1.7 ha; Jongste 2002a, 24). At Enspijk, a single sherd pierced underneath the rim (presumably datable to the Early Bronze Age) was found in the trench with the later Middle Bronze Age(-B) house plans, but its exact context has not been published (Ter Wal 2005b, 28). As such, it can only be used as an Early Bronze Age *terminus ante quem* for the Hooiblok/Enspijk fluvial system on whose levee deposits this site was situated. In the Eigenblok excavations, Early Bronze Age sherds have been uncovered on the crevasse splays, as well as on the levee deposits (Jongste 2002a, 37-38). The number of sherds unambiguously datable to the Early Bronze Age is low and the few and probably unintentional incorporation of these fragments into features does not allow to isolate features or structures presumably datable to this period.[76] However, it is possible that intensity of pre-Middle Bronze Age-B activities at Eigenblok is underrepresented. This may have two complementary causes. First, a phase of crevasse activity prior to *c.* 1920-1680 cal BC has eroded much of the pre-existing landscape, possibly removing finds and destroying more shallow features.[77] Second, the location and extents of the excavations at Eigenblok sites 1 to 4 was steered by the location of the Middle Bronze Age-B vegetation horizon and finds-layer (Jongste 2002, 20-23) and was not specifically targeted towards investigating older occupation traces. Consequently, it is possible that pre-Middle Bronze Age sites (of unknown types) were present on the crevasse- and levee deposits of the Eigenblok fluvial system, that have essentially not been investigated.[78]

Within the De Bogen macro-region, there is considerable evidence of Early Bronze Age use of the stacked crevasse splays uncovered in the various excavations (Chapter 4, section 4.4; Appendix III). Beyond the De Bogen excavations, the number of Early Bronze Age find-spots is low. Only at the excavation known as 'Lage Blok', at *c.*

75 For the group of potbeakers and other decorated beaker period pots, it frequently cannot be determined whether they date to the Late Neolithic and/or the Early Bronze Age, as several decorative techniques and motifs (*e.g.* grooves, v-shaped paired fingertip impressions) were current in both periods. A detailed combined technological-, typological- and radiocarbon supported analysis is much needed for these periods and these ceramic groups in particular.

76 The total number is 11 to 13 fragments; Jongste 2002a, 37-38; Bloo & Schouten 2002, 265-266.

77 Based on a residual channel date for this crevasse phase (AA-37254: 3475 ± 45 BP; Jongste 2002a, 35; Van Zijverden 2002a, 70).

78 As the later crevasse formation extended up to the highest parts of the Eigenblok fluvial system's levee deposits (Van Zijverden 2002a, 60 fig. 2.7a), the low numbers of Early Bronze Age artefacts and features recovered from them may not be used to indicate that the nature of the Early- and later Middle Bronze Age activities differed categorically. Had no crevasse erosion taken place at these highest parts of the landscape, the presence or absence of earlier (Neolithic, Early Bronze Age) traces may – if ever present – have been discussed with more certainty.

1.2 km to the east of the De Bogen excavations, were a few Barbed Wire-stamp decorated sherds recovered (Ufkes 2002b, 70; Milojkovic & Smits 2002). The contexts of these sherds are not specifically discussed, but they most probably originated from a level below that of the Middle Iron Age settlement site which was the focus of this excavation (Van Zijverden 2002c, 40-41). No direct dates are available for the fluvial system on whose levees these Bronze Age activities took place,[79] but based on a comparison of the stratigraphy and sand-depth to the nearby De Bogen excavations, a cessation of fluvial activity of this system prior to the Late Neolithic may be assumed (Van Zijverden 2002c, 39; 2004b). This suggests that activities here took place on the levee deposits of an inactive fluvial system.

For the Early Bronze Age remains uncovered within the various De Bogen excavations, it has proven very difficult to outline specific structures or activity areas (Meijlink 2002b, 770). Even for the sites where Early Bronze Age ceramics occurred relatively abundantly,[80] no evident Early Bronze Age clusters or structures could be isolated. Moreover, it has been argued that the houses claimed to date to the Early Bronze Age, show too much inconsistency in post placement and depth within and between structures for these to be credible.[81] Nonetheless, the diversity and quantity of the indicators of Early Bronze Age use of the stacked crevasse splay landscape is striking. Several Early Bronze Age radiocarbon dates for pits, wells and sherds indicate that these were all current phenomena. Essentially, the available evidence suggests the presence of domestic activities and thus of a settlement site, for which we unfortunately fail to credibly reconstruct post-built structures. Due to the palimpsest nature of the site, no detailed information on the duration and permanence of use can be given (Meijlink 2002a; Appendix III). Presumably, De Bogen site 31 represents a part of the crevasse splay landscape where remains from this period were more prominently present in the past, or where they have been better preserved (*i.e.* adequate preservation and less affected by later erosional activities; Schoneveld & Gehasse 2001). Here too, the diversity, content and quantity of the remains recovered point more towards a (brief?) use as a settlement site, than towards a 'special activity site' as was assumed at the start of the excavations.[82] Additionally, the interpretation of this site as being used only briefly and exclusively during the Early Bronze Age is challenged in this study, as indications for later Middle Bronze Age use are present as well.[83]

In the Wijk bij Duurstede macro-region as well, indications for Early Bronze Age presence are only found within the large scale excavations (Chapter 4, section 4.5). Besides stray finds of Barbed Wire-stamp decorated sherds at Wijk bij Duurstede - De Geer (J. van Doesburg, pers. comm., Aug. 2006), somewhat more information is available for the data from the Wijk bij Duurstede - De Horden excavations. There, a phase of reduced sedimentation between *c.* 2000 and 1700 cal BC led to the formation of a vegetation horizon. This vegetation horizon formed in the floodbasin deposits of the Houten fluvial system, that covered older deposits of the Werkhoven fluvial system.[84] The few (n = 2) Barbed Wire-stamp decorated sherds and a single presumed Early Bronze Age flint arrowhead are presumably associated with this vegetation horizon.[85] As the Bronze Age levels were not specifically targeted at that time of the excavations (Appendix IV), no interpretation of the contexts of these remains can be made. Nonetheless, they do indicate that human activities took place within several hundred meters of active systems.

At Lienden, some Early Bronze Age activities took place on the crevasse splay deposits of the Westerveld fluvial system, which remained active throughout this period. The extent of a vegetation horizon dated 'pre-Middle Bronze Age-B' by stratigraphy could be mapped and showed different densities or archaeological materials (fig. 7.5, d-e; Van Dinter 2002). Presumably, the 20 Barbed Wire-stamp decorated sherds recovered were predominantly associated with this vegetation horizon.[86]

Regrettably it was decided that the remains from the lowermost level would remain undisturbed by the railway construction, despite advice to the contrary (Kranendonk & De Voogd 2002, 18) and the subsequent

79 *I.e.* an unnamed precursor of the Meteren fluvial system; Van Zijverden 20-02c; Appendix III.
80 Ufkes & Bloo 2002; Appendix III, table III.5.
81 Chapter 4, section 4.4.3; Appendix III, esp. figs. III.13; III.14.
82 Schoneveld 2001, 189, *contra* Jongste & Smits 1998, 40; Ter Wal 2001, 32.
83 See section 4.4.3 and Appendix III for details, *contra* Schoneveld & Gehasse 2001, 21.
84 Hessing & Steenbeek 1990, 16; Van Zijverden 2004a; Appendix IV.
85 Letterlé 1985, 335, fig. 4; 341 fig. 9; Hessing & Steenbeek 1990, 16.
86 Siemons & Sier 1999b, 80; Sier & Drenth 1999, 14-17; Ufkes 2002a, 99; Appendix V.

excavations at Lienden focused solely on the upper (Middle Bronze Age) occupation levels. Consequently, a rare opportunity to investigate (Late Neolithic to) Early Bronze Age remains in relative isolation may have been missed. Moreover, the few remains that were recovered and documented now cannot be used in discussions on the settlement nature and dynamics for this period.

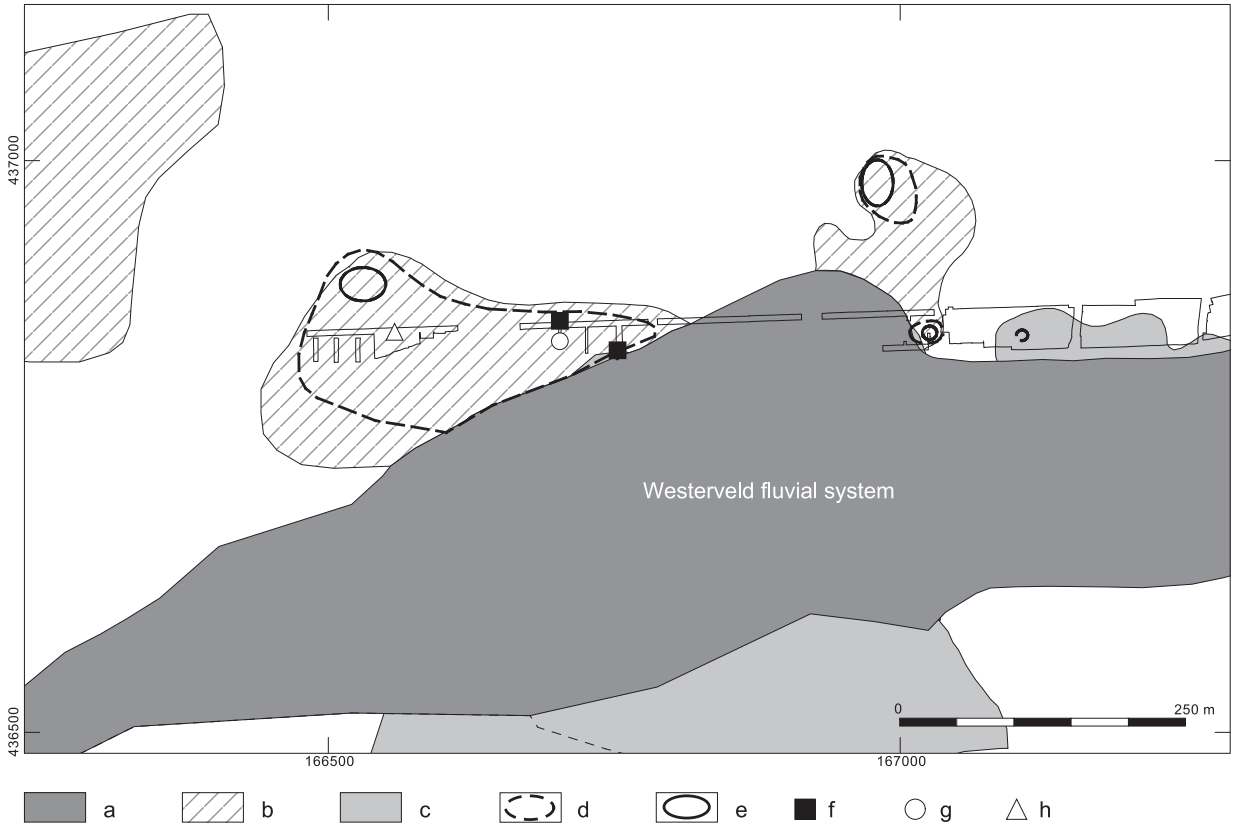

Fig. 7.5 Distribution of the finds-layers dated by stratigraphy to the (Late Neolithic and?) Early Bronze Age at Lienden, in relation to the fluvial landscape and excavation trenches.

a: active fluvial system, b: crevasses of active fluvial systems, c: fossil fluvial systems, d: periphery of finds-distribution as suggested by corings, e: core area of finds-distribution as suggested by corings, f: 'Barbed Wire'-stamp decorated sherds from excavations, g: features, dated by stratigraphy to the Late Neolithic or Early Bronze Age, h: possible Early Bronze Age flint arrowhead.

For the Early Bronze Age remains found in the Dodewaard macro-region, the interpretation does not differ fundamentally from that offered for the Late Neolithic remains. For this period as well, several find-spots of Barbed Wire-stamp decorated pottery are known from the crevasse splay complex wedged between the both active Distelkamp-Afferden and Herveld fluvial systems (*cf.* fig. 4.38, e-f; Appendix VI, fig. VI.7).[87] The numbers of sherds however are low and they were found mixed with older and younger period remains.[88] The absence of clear-cut Early Bronze Age finds from the main Dodewaard excavation is confusing. While palaeogeographical analyses indicate that conditions at this time were favourable, not a single Barbed Wire-stamp decorated sherd was recovered

87 Ten Anscher & Van der Roest 1997, 14-16; Bulten 1998c, 19; Peters 1999, 17; 19; Appendix VI. Possibly, the Late Neolithic and Early Bronze Age remains at Valburg - Zetten-West were washed from their original location (Peters 1999, 19-20), confirming continued fluvial activity in the Dodewaard macro-region.

88 A total of 11 Early Bronze Age sherds at site 21 and one at site 18; Ten Anscher & Van der Roest 1997, 14-16; Bulten 1998c, 19.

from the *c.* 0.4 ha area excavated.[89] Possibly, this is just a matter of chance, as the detailed spatial and chronological distributions of the Dodewaard crevasse splays are not yet fully understood. It may just be that at the location of the most extensively investigated site, a somewhat younger layer of crevasse deposits destroyed or covered earlier traces. Like at Lienden, for this site too it is a pity that no more extensive excavations were planned prior to the Betuweroute railway constructions, as now the pre-Middle Bronze Age-B relicts remain very difficult to interpret.

7.2.3.3 Conclusion: Early Bronze Age sites in the study area

While all of the macro-regions have yielded finds datable to the Early Bronze Age, in none of them were such remains uncovered in certain association with other artefacts and features. The finds were either recovered outside their original context – mixed with finds from other periods – or could not be related directly to specific (clusters of) features or structures. This means that these finds do not greatly improve our understanding of the settlement dynamics for this period. Assessments of the permanency or duration of (settlement) site use rely to a considerable degree on structures being recognizable and more importantly, on cases where material assemblages can be studied for functional clues and seasonal indicators. None of the sites presently investigated in the study area meet these requirements.[90] As such, discussions of the nature and dynamics of Early Bronze Age settlement systems are rendered impossible.

Nonetheless, the current evidence confirms the relative ubiquitous presence of people in a broad spectrum of locations with different fluvial dynamics.[91] The evidence from Wijk bij Duurstede indicates that former levees quite close (< 1 km) to active fluvial systems were used, as were the crevasse splays of active systems (*e.g.* Culemborg - Lanxmeer, Lienden and Dodewaard). In addition, crevasses (*e.g.* Eigenblok sites 1 and 2) and levees (*e.g.* Enspijk, Eigenblok 5 and 6, Culemborg - Den Heuvel, Lage Blok) of (long) fossil systems were used. This 'usage' may very well be (permanent?) settlement, but only for the De Bogen excavations does the diversity and quantity of remains uncovered for the Early Bronze Age presumably support this interpretation. It has been argued, however, that (a) the Early Bronze settlement site elements were not categorically different from those of later Bronze Age periods – otherwise, they would have stood out – but that (b) the variation in construction and placement of such settlement sites elements was so considerable as to render them archaeologically invisible with the present state of knowledge. At Dodewaard, and particularly at Lienden, where locations with Early Bronze Age traces could have been isolated by specifically targeted research, a significant research potential has been left unexplored as no specific research (*i.e.* large scale excavation) aimed at this period was undertaken.

7.2.4 Middle Bronze Age-A sites in the study area

7.2.4.1 Quiet before the storm? Low-visibility settlement archeology

Even more than for the preceding periods, the Middle Bronze Age-A presents a somewhat paradoxical situation. The Middle Bronze Age-A spans a *c.* 300 year period between the end of the Early Bronze Age and the start of the Middle Bronze Age-B at 1500 cal BC during which our knowledge on settlements is extremely limited. While the characteristic pottery decorated in 'Hilversum'-style (see Chapter 5, table 5.1) is known in some numbers from various regions of the Low Countries (see fig. 5.6), no clear-cut settlements can be outlined. Typically, Hilversum-style decorated sherds are found in very small numbers within larger ceramic assemblages datable to the Middle Bronze Age-B or (Middle) Bronze Age in general. Had it not been for a few sites such as Den Haag - Bronovo (Waasdorp 1991; Bulten *in prep.*), Vogelenzang (Ten Anscher 1990) or Barendrecht (Moree *et al.* 2002, Moree *in prep.*) where Hilversum-style decorated pottery occurs abundantly, the hypothesis may have been forwarded that this pottery represented a special purpose ware complementary to the normal (less lavishly decorated) vessels.[92]

89 Steenbeek 1990, 190-193; Van Zijverden 2003b; Appendix VI, fig. VI.6. For the excavation results see section 4.7 and Theunissen & Hulst 1999a.

90 But see Brinkkemper & Van Wijngaarden-Bakker 2005, 492-493 on an Early Bronze Age fishing camp at P14.

91 Note that Early Bronze Age activities on *donken* and activities on levees and crevasse deposits that only recently became inactive, remain to be discovered (*cf.* fig. 7.10).

92 But see table 8.1 on possibly more frequent use of Hilversum pottery in settlement site depositions.

It remains however difficult to explain why Hilversum-style decorated vessels are not known in greater quantities beyond the coastal areas.

The most plausible explanation is that pottery decorated in Hilversum-style was part of an interaction sphere whose centre of gravity may not have been land-based, but marine. Around the time of our Middle Bronze Age-A, intensive cross-channel contacts can be outlined. Such contacts may be reflected by the continental presence of circular enclosures (*e.g.* Bostyn, Blancquaert & Lanchon 2000), British and Irish Bronzes (*e.g.* Butler 1963; 1989; Fontijn *in press*), ornaments such as grooved biconical faience beads (*e.g.* Shepherd & Barclay 2004; Haverman & Sheridan 2006) and the shared presence of pottery decorated in Hilversum-tradition (cord-decorated, horseshoe handles) and possibly the (Late Bronze Age?) round houses.[93] Recently, Needham coined the term 'maritory' to describe this marine territory of (cross-) coastal interaction (Needham 2006, 88; O'Connor 2007, 7). The coastal (and riverine!) distribution of the pottery decorated in Hilversum tradition is striking (Chapter 5, fig. 5.6), although some find-spots are also found more inland to the south of the Rhine.[94]

While the similarities between some English, French and Dutch vessels presumably datable to the Middle Bronze Age-A period is conspicuous, the fact that different interpretative schemes are used across the channel somewhat complicates comparisons. Vessels from the United Kingdom are primarily classified by pot morphology, and additionally by decoration (*e.g.* Gibson 2002; Needham 2005), while continental pottery is classified primarily by the type (technology and iconography) of decoration (*cf.* Chapter 5, table 5.1). Consequently, there is little information on the chronological relevance of pot-morphology for the continental 'Hilversum-style' pots,[95] while conversely vessels from the United Kingdom that would be classified in a continental framework as 'Hilversum-style' ceramics, appear under 'bi-conical urns', 'Trevisker ware', 'Collared urns' and '(enlarged) Food Vessels'.[96] It may be rewarding to investigate whether the (more confined) date-ranges for the European decorative techniques bear relevance to the dating of similar insular examples.[97] In any case, there is considerable evidence to suggest that in both areas pot-morphology and decorative traditions were ultimately based on those of the preceding (late Neolithic to) Early Bronze Age periods.[98] Yet, the distribution of 'Hilversum-style' ceramics appears much more confined compared to that of the Barbed Wire-stamp decorated pottery. In the Netherlands, for instance, it is absent from the north-western sandy soils, while Barbed Wire-stamp decorated ceramics are known from that region.

If the interpretation holds true that Hilversum-style ceramics were part of a North Sea/channel coast maritory, the difference in ceramics assemblage composition (dominant in coastal settings, minority in inland areas) may be better understood. The larger density of find-spots of Hilversum-style decorated vessels along the Oise, Schelde and Rhine tributaries (*cf.* Chapter 5, fig. 5.6) suggests that rivers played some part in the distribution. This still, however, leaves the problem unaddressed in what ways the ceramic distribution did spread inland. A key problem is that it is entirely unclear 'what' exactly was distributed. Possibly, only the pottery form and decoration were shared, implying local production and emulation, but also pots themselves may have traveled. Future trace-element and diatom analyses may shed light on this matter. Alternatively, it may have been its contents (possibly of coastal origin?, *e.g.* salt, salted foodstuffs, metal scrap or ores?) that were sought for in more inland and upstream areas. It seems probable, however, that a much more encompassing package of cultural elements were shared, instead of just the beakers. Needham's (2006) discussion of the distribution of different artefact types such as ornaments

93 On roundhouses see Desfossés, Martial & Vallin 2000 and references therein; Pope 2003; Jahier 2005; Mare 2005, *cf.* section 5.8.

94 Additionally, it may be interesting to study the evolution of the 'Culture du Rhone' pottery traditions (*e.g.* Roudil 1972; Guilaine 1972; several contributions in Mordant & Gaiffe 1996; Lemercier 2002; Lemercier & Gilabert *in press*) in relation to those of the north-west coastal maritory. There as well (starting from a local Barbed Wire-stamp decorated tradition) several elements typical for 'Hilversum-style' pots are found such as cross-hatched motifs (done in cordons), cordons linked to knobbed handles – like horseshoe handles mimicking handles attached to an organic encasing netting ? – while cord-decoration is absent to very infrequent there.

95 NL: *Hilversum* (Glasbergen 1969), D: *Hilversum* (Hoffman 2004, 70-80), F: *Urnes à décor plastique* (Blanchet 1984).

96 *E.g.* Gibson 2002, 21 fig. 7; 26 fig. 9; 54 fig. 25; 97 fig. 46; 100 fig. 48; 102 fig. 49, *cf.* Theunissen 1999, 206; Fokkens 2005c. In French terminology, some Hilversum-style decorated pots are classified as '*céramique à anses en fer à cheval*' or '*céramique à decor à la cordelette*' (Warmenbol 1996, 643) or simply as '*vases biconiques*' (Roussot-Larroque 1996, 518).

97 This is a task, however, that lies beyond the scope of the present study.

98 This is exemplified by hybrid types such as the Barbed Wire-stamp decorated Hilversum-style vessels from Wijchen (Glasbergen 1954, 125 fig. 63.4-5), Vorstenbosch (Modderman 1959a) and the pot from Rhenen-Remmerden, which is decorated in Early Bronze Age tradition yet has Middle Bronze Age morphological traits (Jongste 2001, 12 fig. 14).

and drinking cups shows how varied and far-reaching such interaction could be. While such far-reaching contacts or influences can be identified in some cases for this period, it is also evident that regional variation in the dominance (*i.e.* relative frequency of occurrence) of Hilversum-style decorated pottery can be outlined between the coastal and inland/upstream sites. Whereas some coastal sites (*e.g.* Den Haag - Bronovo, Vogelenzang, Barendrecht (*supra*)) have yielded significant amounts of Hilversum-style decorated pottery,[99] the scarcity of this pottery in inland settings indicates that these were not produced and/or used there in similar quantities.

The fact that sherds decorated in Hilversum-style generally form only a minority within ceramic assemblages of (more extensively investigated) sites, renders it difficult to indicate possible Middle Bronze Age-A settlement sites supplementary to the coastal sites already referred to. Moreover, the excavations of these coastal sites are of limited size and discontinuous surface area, which has complicated the identification of settlement site elements for this period (Chapter 5, section 5.2.2). Essentially, studying settlement sites for the Middle Bronze Age-A is looking for a needle in a haystack: only a limited set of bronze and ceramic artefacts can be reliably dated to this period, and the excavated presumed settlement sites have thus far yielded no reconstructed buildings or features that can be reliably used to outline occupation traces from this period at other sites. Moreover, I feel that archaeologists should perhaps not focus on 'trying to locate' Middle Bronze Age-A settlement sites beyond the coastal areas, but should accept that they may be different beyond the coast, and instead investigate *why certain elements* from the cultural set shared within the maritory were (literally and/or figuratively) taken up by (specific) non-coastal communities.

7.2.4.2 Middle Bronze Age-A settlement sites in the study area?

In short, there are no sites known from the study area where artefacts or features were recovered in isolation or in such diversity and/or quantities that they could sustain an interpretation as representing a possible Middle Bronze Age-A settlement site. Even at Meteren - De Bogen, with several house-sites claimed to date to the Middle Bronze Age-A (Meijlink 2002b, 774-779; 2007), critical (re)analyses of the structures, radiocarbon dates and pottery (Chapter 4, section 4.4.3; Appendix III) have shown that the structures forwarded cannot be proved to date to the Middle Bronze Age-A and that in general, only very few sherds date unambiguously to the Middle Bronze Age-A.[100] Nonetheless, the presence of these ceramics and several samples radiocarbon dated to the Middle Bronze Age-A indicate that some activities took place – possibly indicating a settlement site – but that these activities cannot be analyzed in relation to settlement dynamics or discussions of occupational duration or permanence.

At Zijderveld, only a single post was radiocarbon dated to the Middle Bronze Age-A, but as no ceramics were found, later re-use of older wood cannot be excluded (Theunissen & Hulst 1999b, 158). I have already argued above (section 7.2.3.2) that several of the features at the lowest stratigraphic levels at Eigenblok 5 and 6 predate the Middle Bronze Age-B, but cannot be dated directly. Therefore, the few clear Hilversum-style sherds (n = 8-9; Jongste 2002a, 37-38), a possibly 16th century BC dagger (Hielkema 2001, 337) and a single post radiocarbon dated to the Middle Bronze Age-A (possibly of a structure; section 5.2.2; fig. 5.5, no 4) are the few direct indications of use of the Eigenblok levee and crevasse deposits during this period. For the three to four Hilversum-style decorated vessels at Wijk bij Duurstede - De Horden, no detailed context has been published (Letterlé 1985, 341 fig. 8; 9.2-3). At Lienden, no clear-cut Hilversum-style ceramics were recovered.[101] Within the Dodewaard macro-region, use of the crevasse splays is likely to have continued, although only very few sherds decorated in Hilversum tradition were recovered from the different sites subjected to test-trenching.[102]

7.2.4.3 Absent or masked? Middle Bronze Age-A settlements?

The Middle Bronze Age-A remains from the study area tie-in well with the pattern established for the other geogentic regions beyond the coastal zone (section 7.2.4.1). A limited number of find-spots are known, that moreover generally yield only small amounts of diagnostic pottery. The Middle Bronze Age-A may be the period poorest in type-fossils

99 Bloo *in prep.*; Bulten, Boonstra & Bloo 2008, *cf.* Île Tatihou; Marcigny & Ghesquière 2003, esp. 75-97.
100 The ceramics concern 24 sherds at site 28-1 and 16 from all other De Bogen sites; Appendix III, table III.5.
101 But see Sier & Drenth 1999, 17; Ufkes 2002a, 95-96.
102 A total of five to six sherds; Jongste 1997, 13; Bulten 1998c, 19; Jongste & Ten Anscher 1998; 14-15; Peters 1999, 17; Appendix VI.

for the various periods under investigation in this study. Only diagnostic pottery fragments, some bronze types and radiocarbon dates may indicate human presence at the different sites. It should be noted that in nearly all cases, continued use from the preceding Early Bronze Age onward is a possibility.[103] In absence of better recognizable artefact types and domestic structures, the issue whether the few remains recovered at the different excavations reflect settlement sites will remain unresolved. In this study, I have used the somewhat larger set of indications (*i.e.* several radiocarbon dates and relatively more sherds) to postulate that the De Bogen palimpsests may mask a use-phase as a settlement site during the Middle Bronze Age-A.

The remains recovered at other sites may reflect more transient uses of these locations. Alternatively, it may have been the case that towards the Middle Bronze Age-B, the percentage of decoration on and between vessels drops, and that fewer other typologically datable finds (*e.g.* bronzes) were current. If the hypothesis is correct that Hilversum-style pots were (1) perhaps not produced at all, or (2) not at all sites, or (3) not in comparable quantities in the study area, the intensity and nature of human presence during this period is prone to be downplayed unacceptably. In other words: accepting the low-diagnostic character of material culture and settlement site elements for this period, even year-round long-term habitation will still escape our view if masked by traces of similar (and similarly non-diagnostic) use-phases.

As I see no urgent reasons to assume that the population densities or subsistence base differed significantly for the Late Neolithic-B to Middle Bronze Age-A communities, the remains from these periods may (but need not) reflect similar usage of the landscape. Again, we cannot but argue from the negative evidence: as no clear-cut structures, finds-concentrations or feature types can be recognized that are distinguishable from earlier (Late Neolithic) or younger (Middle Bronze Age-B) use-phases, the usage need not have differed categorically. Yet, in all fairness, the extreme paucity of numbers of datable pottery fragments is in stark contrast to the abundance of ceramics recovered from well-preserved Middle Bronze Age-B house-sites (*cf.* Chapter 6, fig. 6.36). Acknowledging the small size of the various excavations, the impression remains that even if pottery decorated in Hilversum tradition was only incidentally present (*i.e.* made or imported) at Middle Bronze Age-A settlements, the few numbers recovered at present from the various sites seem to indicate anecdotal rather than long-term permanent domestic use. Two lines of interpretation – presently of equal validity – remain: (1) usage (*i.e.* settlement structure and duration) was indeed more short-term, or (2) many remains of the Middle Bronze Age-A are presently (through their nature; *e.g.* simple postholes, undecorated pottery of generic Bronze Age fabric) erroneously dated to other periods. Only when (a) a site is excavated beyond the coastal setting for which an exclusively Middle Bronze Age-A period of use may be argued for, can (b) the search for additional diagnostic elements be continued and (c) can the relation between non-diagnostic and diagnostic elements (pottery?) be established and used to better interpret the presently known data for this period.

7.3 Middle Bronze Age-B settlements: between wandering single farms and fixed settlements?

7.3.1 Middle Bronze Age-B models of settlement dynamics and site types

As the Middle Bronze Age-B occupation traces form the main data set and research topic of this study, a brief recapitulation of the ideas on settlement dynamics suffices here. I have argued in Chapter 3 (section 3.3) that for the Middle Bronze Age(-B), house-sites are seen as units that were periodically – generally assumed to be after a single human generation – relocated. In this model of 'wandering farmsteads', only few (diffusely distributed) houses are seen as functioning contemporaneously within a settlement territory, each of them relocating to new grounds after a given time-period. This model predicts that Middle Bronze Age-B house-sites will mostly show only a single house-phase. This model also suggests that clustering of houses will be rare and that the structuring of the direct vicinity of the house may be steered by properties (*e.g.* orientation) of the defining house rather than by other (spatially more extensive) elements of the cultural landscape such as other house-sites or land parcelling features. The validity of such hypotheses will be evaluated below. Yet first, some attention is paid to Bronze Age site typology. Are house-

103 Only at Dodewaard - site 20 (Dodewaard - Valburg/Hiensche Veld; Jongste 1997), no Early Bronze Age sherds were recovered and at site 22 (Valburg - Zettensche plas; Jongste & Ten Anscher 1998) only tentative Early Bronze Age sherds were recognized (Appendix V).

sites (or 'farmsteads') the only or dominant site type for this period, or should additional site types be incorporated into accounts of Middle Bronze Age-B settlement dynamics?

As its name suggests, the 'wandering farmsteads' model indicates that a new spatial level – the house-environment – is seen as the dominant element in analyses of settlement dynamics. This presents a break from the models compiled for the preceding periods, where 'hunting-', 'logistic-' or 'raw material-procurement'-camps are seen as integral parts of the settlement dynamics (fig. 7.1). It is questionable whether this is a proper approach. I have argued above that for the earlier periods (*e.g.* Late Neolithic-B to Middle Bronze Age-A), such non-domestic sites may be present but cannot be identified with certainty. Moreover, I have suggested that perhaps assumptions by archaeologists on what the settlement dynamics for these periods *should* look like, have overly emphasized the importance of such sites (section 7.2). Conversely, it may be that our *notions* of the subsistence strategies of Middle Bronze Age-B communities precludes the presence of such site types (*e.g.* Louwe Kooijmans 1993a, 101; 104), while in reality they may have been present in numbers and importance comparable to that of preceding periods. I have argued that various tasks may have been undertaken away from settlement sites that required brief to longer ventures into other parts of the landscape, for example to undertake activities such as fishing, metalworking, pottery production, raw material procurement and maintaining social contacts. Presumably, site types intrinsically different from settlements are associated with such activities, but we have failed to recognize and investigate these yet. Essentially, the types, numbers and importance of sites other than domestic sites need not have differed categorically between the Late Neolithic and the Middle Bronze Age-B, but as they are difficult to outline archaeologically, they are prone to inappropriate conceptual contrasting (fig. 7.6).

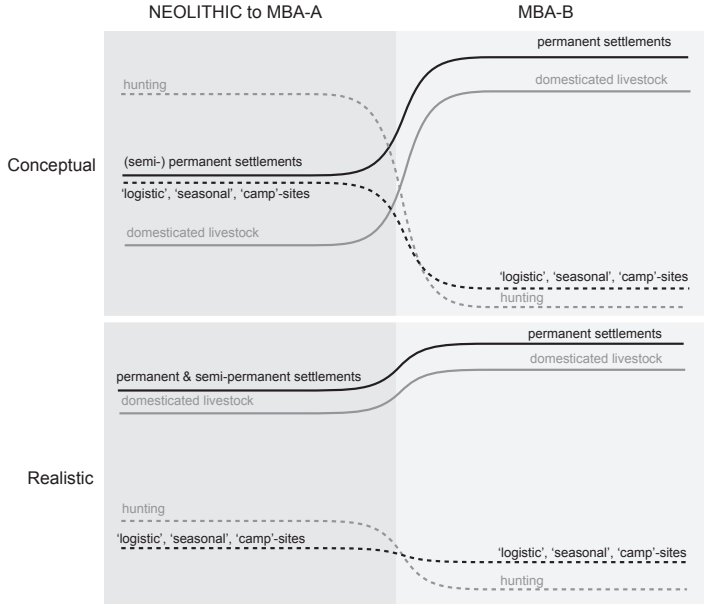

Fig. 7.6 Schematic example of the ways in which Neolithic to Middle Bronze Age-A settlement systems are frequently contrasted to those of the Middle Bronze Age-B. The top part shows an interpretative framework in which changes in settlement dynamics (*e.g.* the permanancy of occupation or the presence of non-domestis sites like hunting camps) and subsistence base (*e.g.* the importance of hunting or domesticated livestock) are strongly contrasted between the Middle Bronze Age-B and the earlier periods. The bottom part shows an interpretation of such changes that is considerd more realistic by the present author.

For example, the importance of activities like hunting, fishing and fowling – and the 'logistic', 'processing' or 'seasonal' sites on which such activities were carried out – is often considered to have decreased significantly with the start of the Middle Bronze Age-B (*cf.* fig. 7.6). However, it can be argued that hunting already decreased in importance much earlier,[104] and that the presence of site(-type)s complementary to domestic sites may have been

104 *Cf.* Clason 1999; Arnoldussen & Fontijn 2006, 399 fig 8 and references therein; *supra*.

relatively similar for the Middle Bronze Age-B and the directly preceding periods (*infra*). Similarly, the contrast often claimed between the Neolithic and the Middle Bronze Age-B periods in the permanency of occupation (*i.e.* the 'Neolithic' being characterized by more impermanent and semi-permanent occupation), may prove less dramatic if the evidence for permanent settlement from the Middle Neolithic onward is reconsidered (*e.g.* Amkreutz *in prep.*, chapter 8). The differences between such assumed (presumably somewhat exaggerated) changes in subsistence strategies and settlement dynamics, and more realistic scenarios, are visualized in the top and bottom part of figure 7.6 respectively. This figure is therefore not intended as an explanatory or descriptive model, but serves merely to outline in what ways the Neolithic to Middle Bronze Age-A settlement dynamics and subsistence base are frequently, yet often unsubstantiated, contrasted to the Middle Bronze Age-B.

While it can be assumed that site types such as food-procurement and processing sites (*e.g.* fishing, fowling, incidental hunting?) as well as raw material procurement sites (*e.g.* stone, coppice, thatch, wood, clay) must have been present during the Middle Bronze Age-B like in earlier periods, only very few are known.[105] During the palaeogeographical mapping around the Eigenblok excavations, a possible 'special purpose camp' location was postulated based on its small spatial extent and geographic location at the transition from the crevasse splay to the floodbasin (Van Zijverden 2002a, 63). As this site was not disturbed by railway construction, it has not been excavated and this interpretation must remain tentative. Another example may be the Middle Bronze Age-B phase of Oldeboorn, which was presumably a pike-catching and processing site also used previously during the Bell Beaker phase (Fokkens 1998a, 111, *cf.* IJzereef 1981, 117-126). While the small numbers of such sites known may be used to question the validity of the assertion that they existed in some numbers for this period, one should keep in mind that traditionally (and still; *e.g.* Jongste 2002a, 20-21; Hielkema 2003) excavations are focused on house-sites. These site types are both more easily detectable and have the 'virtue' of offering most archaeology-per-euro.[106] Therefore, such sites are – through their better detectability – overrepresented (Louwe Kooijmans 1993a, 94) and moreover favoured in decision phases of heritage management for their archaeological richness. Consequently, specific research of 'special purpose sites', for both the (Early and Middle) Bronze Age and the preceding Late Neolithic, is much needed.

The better visibility of houses for the Middle Bronze Age-B (Chapter 5, section 5.2.3) has the positive consequence that for this period, the distribution and possible interrelations with other settlement site elements can be studied in more detail. In Chapter 6, I have focused predominantly on the information available on the nature (*i.e.* the constituent elements and their (spatial) interrelations) of the Middle Bronze Age-B house-sites, and in this section I will focus on the available information on settlement dynamics.

I have argued in Chapter 3 (section 3.4.2) that the use-life of individual Middle Bronze Age-B houses is likely to have exceeded 50 years. This weakens explanations of domestic mobility that assume a close link between household life cycles and those of houses (section 3.4.3), but does not argue against a system of settlement dynamics with periodical relocations. Therefore, in order to asses the validity of the wandering farmsteads model, an analysis of the diachronic dynamics of Middle Bronze Age-B house-site uses is in place. First, the Middle Bronze Age-B house-sites from the study area are discussed. Thereafter, the results are compared to other regions within The Netherlands.

7.3.2 Middle Bronze Age-B house-sites in diachronic perspective

The data set of Middle Bronze Age-B house-sites in the study area comprises *c.* 36-45 house-sites which supported a total of 42 to 50 houses. If the house-sites of Tiel - Medel 1 and 8 are added, 42-52 house-sites with 51-59 Middle Bronze Age-B houses have been uncovered.[107] This large number of house(-site)s allows analyses of the nature of, and differences between, house-site use histories.

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105 *Cf.* Tesch 1993, 14 and Gröhn 2004, 69 on Swedish Bronze Age special activity sites.

106 *Cf.* section 2.7; 2.7.3; fig 6.36. Virtue is placed here in brackets as this has a tendency to backfire: locations with many finds recovered can, and frequently do, represent palimpsest sites used during multiple periods, which limits understanding of the individual constituent phases.

107 The house-sites from Tiel - Medel are set apart here because they were discovered during the writing of this thesis and have consequently not been integrated into this study in the same way as the other Middle Bronze Age settlement sites (Chapter 1, note 27; Hielkema 2003; Van Hoof & Jongste 2007).

For the phase preceding the Middle Bronze Age-B occupation of these house-sites, there is much variation in the types of uses (table 7.1). First, at some sites (*c.* 15-25 %), such as at parts of Zijderveld, Tiel - Medel 8 and Wijk bij Duurstede - De Horden,[108] the Middle Bronze Age house-sites were constructed in areas where the absence of other features suggests that they had not been used previously as settlements.[109] Second, at other sites – such as at parts of De Bogen and Eigenblok excavations – house-sites were constructed in areas of low to high feature densities (Chapter 4, sections 4.3.4; 4.4.3). For these locations, no evident structures could be recognized within the feature concentrations, but judging by the finds recovered and/or radiocarbon dates obtained, it is probable that some of these activities predated the Middle Bronze Age-B (*c.* 25 %).[110] Third, structures (houses or outbuildings) overlapped with the house plans at *c.* 27 % of the house-sites.[111] Based on the typology of the structures that overlapped the house plans, it is often clear for the houses – and assumed for the granary-type outbuildings– that they date either to another use-phase in the Middle Bronze Age, or that they post-date the Middle Bronze Age occupation phase(s). Additionally, a few house-sites were constructed next to older barrows (*c.* 8-10 %) or older palisades (*c.* 5 %).[112]

nature of prior activities	feature density	nos. of house-sites	interpretation
unclear (undated features)	very high	1	possibly on former domestic site
unclear (undated features)	moderate	3	possibly on former domestic site
LNEO to MBA-A features	high	7	possibly on former domestic site
LNEO to MBA-A features	moderate	3	possibly on former domestic site
LNEO to MBA-A features	low	2	possibly on former domestic site
unclear to 'none'	moderate	5	on former 'empty' area
'none'	low	7	on former 'empty' area
palisade	moderate	3	near older palisade
barrow	high	1 (2?)	near older barrow
barrow	moderate	2	near older barrow
barrow	low	1	near older barrow
outbuilding or house	high	3	on BA or later settlement site
outbuilding or house	moderate	4	on BA or later settlement site
outbuilding or house	low	6	on BA or later settlement site

Table 7.1 Indications for the previous uses of Middle Bronze Age-B house-sites in the Dutch river area.

The presence of older occupation traces can be interpreted either as chance palimpsest situations, aided by the fact that that no changes or sedimentation in the micro-topographic landscape occurred that could stratigraphically separate these use-phases. For instance, at Eigenblok, fluvial activity had long ceased and only gradual 'drowning' (see section 2.3.5) of the landscape by the combined processes of shrinkage, compaction and ongoing sedimentation by other rivers took place between the Middle Neolithic and the Early Iron Age (fig. 4.10; Van Zijverden 2004b). If local communities from the Late Neolithic and the Middle Bronze Age-B all similarly preferred the highest parts of the micro-topographic landscape for post-built structures, it is no wonder they are found interspersed with each of them (Jongste 2002a, 37-38; Appendix II). While the (limited) availability of proper plots and similar settlement location preferences may indeed have *bounded* the locations of Middle Bronze Age-B house-sites, the above argumentation overlooks the possibilities for (individual) choices of location that certainly did exist. The results from the De Bogen excavations are a case in point. Within an undulating, yet essentially similar micro-topographic landscape, distinctively different locations were settled in the Middle Bronze Age-B. Some Middle Bronze Age-B house-sites (such as those at De Bogen sites 28-1, 28-4 and possibly 30) were constructed in areas that were intensively to moderately used (*i.e.* the usage reflected by feature densities and finds-distributions) during the preceding periods, while at the 'same' time some house-sites were constructed in previously unbuilt areas (*e.g.* De

108 For Zijderveld see Chapter 4, section 4.2, fig. 4.3, for Tiel - Medel 8 see fig 6.12; 6.54; Van Hoof & Jongste 2007 and for Wijk bij Duurstede - De Horden see Chapter 4, section 4.5.3.

109 Calculated by the ratio of 'none' and ('none' + unclear to 'none') respectively against the total observed cases (n = 48-49) in table 7.1.

110 Calculated by the ratio of 'Late Neolithic to Middle Bronze Age-A features' listings against the total observed cases (table 7.1).

111 Calculated by the ratio of 'outbuilding or house' listings against the total observed cases (table 7.1).

112 House-sites near (presumable) barrows: Eigenblok sites 5 and 6 (section 4.3.4), De Bogen house-sites 45BH/HH (section 4.4.3) and Wijk bij Duurstede - De Horden 9 (section 4.5.3).

Bogen house-sites 45AH, 45CH, 30 AH and 30GH; fig. 4.16; Appendix III). This means that the options were open to settle either on previously used locations or on pristine plots, and that both were used.

While there may be a practical side to settling as yet unbuilt areas (*e.g.* no debris, no post-stumps to remove, less animal infestations?), it should not be overlooked that opposite views may have been as valid. Previously settled areas may have communicated the potential for successful living in these areas, regardless of whether such previous occupation was seen as the work of mythically or appropriated ancestral occupants, or genealogically traceable forbears. For example, in ethnographic studies, there are various examples of communities more positively appreciating places in the landscape that had proven their value by 'ancestral' activities. Two quotes from Rival's (2002) study of the Amazonian forest dwelling *Huaorani* illustrate this well:

> *'They explored the forest systematically, looking for useful plants and, more important, for evidence of previous occupation, such as potsherds, stone axes, and plant species all taken to be unmistakable signs of previous human occupation. During evening conversations, after having share a copious meal cooked from forest food, they would exchange news about resource-maturing states and locations (...).'* (Rival 2002, 70),

> *'Meanwhile, men were felling trees (...) to make house poles. Women traditionally contribute vine ropes to attach the house poles that men erect, as well as mö leaves to make the water-tight inner roof that lines the external palm roof woven by men. Back from the gathering expeditions, we would work together at leveling the ground underneath the great roof, digging out all root remains and pulling out stones and debris. Each unearthed bits of clay pot or broken stone axe was discovered with great pleasure and excitement, and preciously kept by the women. They were the material signs that* mono memeiri *(literally 'our grandfathers') had once lived there.'* (Rival 2002, 94).

A similar observation has also been published for the occupants of the Solomon Islands, where 'Knowledge of past settlements is not simply a part of memory, to be recalled when asked for by an outsider: it is of major importance in a number of aspects in everyday life (…).' (Miller 1980, 453, *cf.* 456; Joyce 2000, 196).

Presumably, during the Bronze Age (older) barrows formed rich sources of (claimed) ancestral legitimacy, societal well-being and fertility, which may explain why Middle Bronze Age-B house-sites were occasionally erected next to them.[113] A deliberate and recurrent intertwining of funerary and domestic functions has also been noted for the barrow location at De Bogen site 45 (section 4.4.3). There, on a location already in use in the Late Neolithic, a Middle Bronze Age-B house overlapped with a presumably older funerary monument, and may itself have been cross-cut by yet another funerary phase (figs. 4.15; 4.21; Hielkema, Brokke & Meijlink 2002, 197-236). The fact that for the unique post-built (mortuary) structure 45HH dimensioning common to Middle Bronze Age-B houses was used, may be just another reflection of such deliberate entwining of domestic and (ancestral) funerary domains (section 8.2.3.3; Bourgeois & Fontijn 2008; Meijlink 2008). The possibility that not only barrows, but also other vestiges of past habitation (*e.g.* features, debris, pits and palisades) may have carried connotations of ancestral approval and success – which in turn may have been quite important factors in deciding settlement site locations – cannot be proven in archaeological contexts but should at least be kept open.[114]

From such a perspective it can be argued that while an overlap between older occupation traces and Middle Bronze Age-B house-sites may have been a consequence of chance or necessity, this may also have been intentionally favoured. The overbuilding of houses on Middle Bronze Age-B house-sites (*cf.* fig. 3.3, e), which occurred at Enspijk (fig. 4.5, A; Ter Wal 2005b) and Tiel - Medel 8 (fig. 6.12, A; Van Hoof & Jongste 2007) may similarly have been a deliberate choice to reuse a location that had proved its potential by past occupancy, as there was enough space for these houses to be situated elsewhere, had avoidance been preferred.

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113 Section 8.2.3.3; Harsema 1982, 156; Fokkens 1999, 32; 2005d, 72; Gerritsen 2003, 237; Kolen 2005, 145; Bourgeois & Arnoldussen 2006; Bourgeois & Fontijn 2008.

114 *Cf.* Jackson 1956, 24; Middleton 1973, 374; Christie 1992, 22; Waterson 2003, 45, Gerritsen 2003, 240.

There are several indications that once a choice for a particular house-site location (and orientation) was made, these locations maintained this function in the long-term. The exact duration of such a 'long term' may be situated somewhere between 50 years and three centuries.[115] To this end, or as a consequence of such presumably long-term usage of house-sites, repairs were commonly undertaken (*c.* 37 % of the houses; table 7.2). Of such repairs, only the re-digging of ditches, replacement of wattle-and-daub walls and replacement of roof-bearing posts are visible archaeologically, altough the re-plastering of walls, floors and hearths and refurbishing of thatch will have occurred more frequently.[116] The fact that some houses may have been extended (*c.* 2-4) can also be interpreted as reflecting an attitude to prolong the use of a given location.[117] While additional domestic space (whether for storage, livestock or people) could have been created by building a bigger (or additional) farmhouse elsewhere, it was decided to prolong the use-life of the existing house instead.

Moreover, when houses had to be replaced completely (regardless of whether this was necessitated by practical (timber decay) or ideological motives), they were often rebuilt on the same spot. While there may be some differences in the dimensioning, ground plan or orientation of the rebuilt houses, they frequently remain so similar as to assume that the occupant groups of both house-phases were related, if not the same.[118] Examples of such nearly identical rebuilt houses were found at four different sites.[119] At one of these, a rather extreme example of such rebuilding of houses was documented. At De Bogen site 30, a farmhouse was rebuilt three times, with only minimal changes in orientation and location for the four house phases (fig. 7.7).

Additionally, I have argued in Chapter 6 (section 6.4.2) that the rebuilding of granary-type outbuildings does not only indicate past intentions to maintain house-site functionality over prolonged time periods, but also that the spatial ordering of elements *within* house-sites was considered important to maintain over time. As (shared) orientation was an important aspect of such ordering (sections 6.4.1-6.4.2) it is probable that the outbuildings which show a different orientation to the houses with which they overlap, date from a different phase of use of the site. Unfortunately, the possibilities to date such overlapping structures are generally limited and such structures can therefore pre-, as well as post-date the occupation phase. Based on indirect typochronological (see section 5.4) and contextual arguments (section 4.5.3), I feel that those overlapping outbuildings that conform in orientation to the houses (*e.g.* fig. 4.5; 4.29), may nonetheless date to the Middle Bronze Age-B. While such outbuildings by definition belong to another (later, yet still Middle Bronze Age-B?) use- or house-phase, their placement may have been a deliberate act intended to create and stress the ties between former (or ancestral) and later occupants. In anthropological studies, there are various examples in which ties between former 'ancestral' houses and branched-off houses are stressed in comparable ways.[120]

From the entries in table 7.1 with 'low feature density', it is clear that in circa one-third of the cases, Middle Bronze Age-B house-sites were not utilized for, or affected by, later habitation. In some cases, such as at Zijderveld, De Bogen and Wijk bij Duurstede, on-going sedimentation may have rendered (the lowermost parts of) the micro-topographic landscape unfavourable for later habitation. A few weak indications for Late Bronze Age use of the Zijderveld, Dodewaard, Eigenblok and the De Bogen micro-regions are known (Appendices I-IV). Early Iron Age structures have been recognized at Eigenblok and Zijderveld.[121] At these sites, features found within the houses and structures overlapping with houses may date to these periods. At Wijk bij Duurstede - De Horden, Early Iron Age

115 Based on documented wood-durability (section 3.4.2) and the date-ranges between the earliest Middle Bronze Age-B occupation and oldest dates for later (*i.e.* end Middle Bronze Age-B/Late Bronze Age or Late Bronze Age/Early Iron Age) structures at Zijderveld, De Bogen and Tiel - Medel 8.

116 See Chapter 3, note 62.

117 *E.g.* De Bogen house 28-1AH (fig. 4.14, B) or Eigenblok house 6.2 (fig. 4.8, 7).

118 See Chapter 3, note 20 for examples.

119 Eigenblok (houses 2.1 and 2.2; fig. 4.8, nos. 2 & 3), Wijk bij Duurstede (house 2, possibly also houses 4-7; fig. 4.23, no 2; fig. 4.27), Dodewaard (houses 1a; 1b; fig. 4.37, B & C) and De Bogen (*e.g.* houses 29B2H and 29B3h; fig. 4.14, H & I).

120 For example, with the eastern Timorese *Mambai*, branched-off houses are empowered by '*buis noran*' or '*fo otan*' rituals (literally; to pluck a leaf or break a branch) wherein stones and some ritual objects are taken from the 'father/mother' house to the new house (Traube 1980, 295). See also Bloch (1995, 77; 82) and Waterson (2003, 45).

121 See Hielkema, Prangsma & Jongste 2002, 108-109; Appendix II; fig. II.19 and Theunissen & Hulst 1999b, 156-177; Appendix I; fig. I.21 respectively.

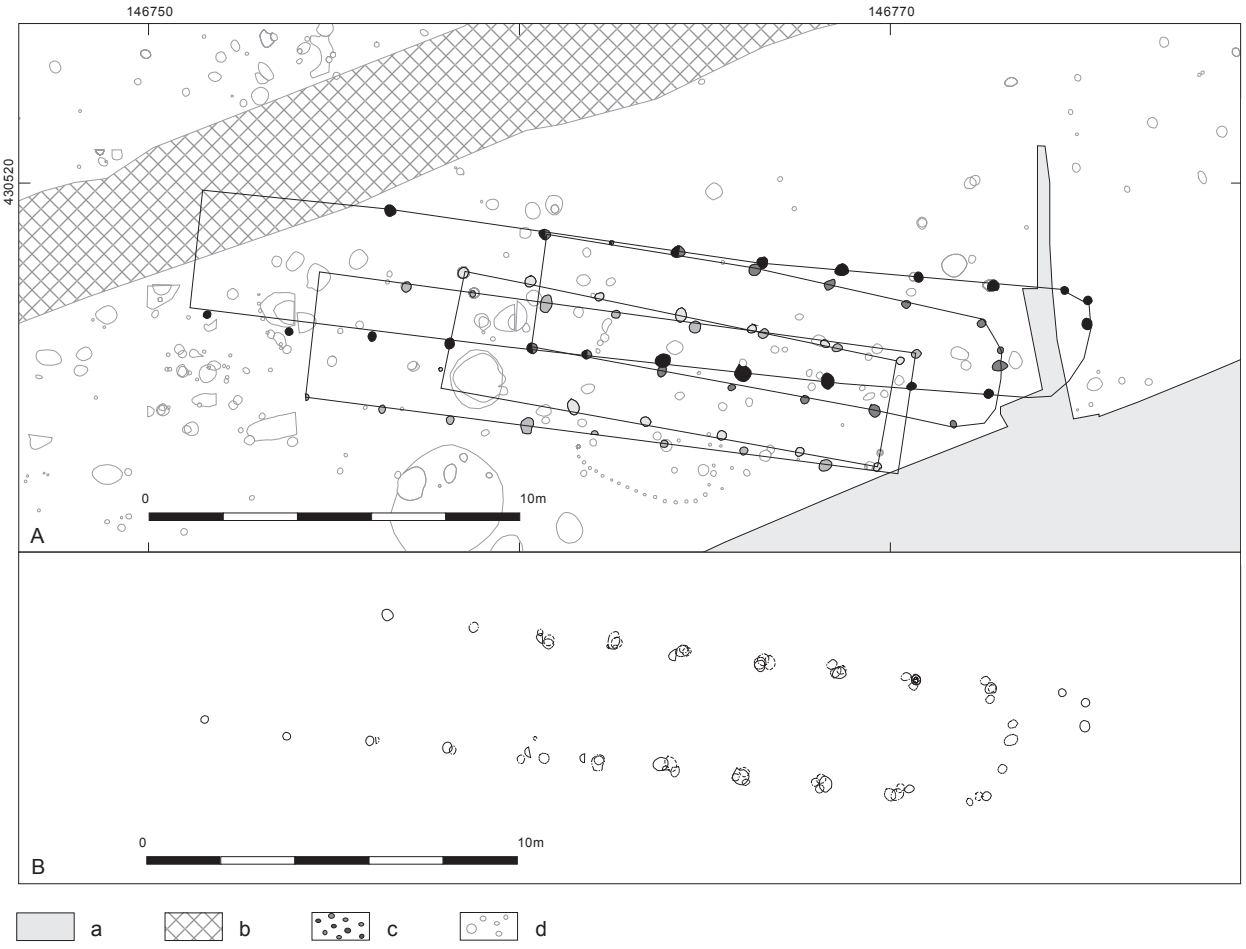

Fig. 7.7 Farmhouse rebuilt three times at De Bogen site 30 (A: after Hielkema, Brokke & Meijlink 2002, 145-154; outlines added for clarity; they have no structural relevance). The four phases are rotated and overlain to show the similarities in roof-bearing structure in B.

a: not excavated, b: recent disturbances, c: features associated with house-phases, d: other features.

occupation took place as well, but this was separated from the Middle Bronze Age-B levels by a layer of sediment.[122] Generally, no typologically datable structures can be reconstructed from the features that overlap with the houses. The type-1a fences that overlap with houses at Dodewaard and Wijk bij Duurstede - De Horden house 3, also occur on Early Iron Age sites, but at Dodewaard no Early Iron Age ceramics were recovered, while at Wijk bij Duurstede the fences were found at a level stratigraphically above that of the house. Other types of later (yet possibly still Middle Bronze Age-B) usage of house-sites may be the construction of ditches, such as the ditches that cut-across De Bogen houses 29B2H/B3H (fig. 4.17) or the ard-marks observed at Eigenblok sites 5 and 6.[123]

While these examples offer some insights into the diversity of later uses of Middle Bronze Age-B house-sites, problems of inadequate dating resolution and representativeness do not allow for discussion of these patterns in more specific terms. In general, it is probable that Middle Bronze Age-B house-sites were erected in three particular types of locations; (1) in areas that showed some traces (finds and features) from preceding periods (*c.* 40 %), or (2) in areas presumably settled earlier during the Middle Bronze Age (*c.* 27 %) or (3) in areas previously left completely or nearly completely unbuilt (*c.* 25 %; table 7.1). The use of a given plot may have altered already during

122 Hessing 1989; Hessing & Steenbeek 1990, 17; Appendix IV.
123 Hielkema, Prangsma & Jongste 2002, 141-142; 156; Appendix II, fig. II.14; II.16.

the Middle Bronze Age-B, and the various post-holes, ard-marks and fences that overlap with Middle Bronze Age-B house(-site)s, may date to a later phase of Middle Bronze Age-B use. For sites that yielded remains datable to younger periods, it is plausible that traces from these periods penetrated down to the Middle Bronze Age-B levels, in locations where insufficient sedimentation occurred to separate these. However, there are indications that prolonged Middle Bronze Age-B occupation need not by definition have lead to a dramatic increase of feature densities on Middle Bronze Age-B house-sites. Particularly house-sites 3 at Zijderveld and 5 at Eigenblok are good examples of house-sites where a long use-life is evidenced by the dates obtained (section 3.4.2), but where feature densities are moderate to low. At Wijk bij Duurstede - De Horden and Tiel-Medel 8 as well, the low feature density of the different house-sites is striking (section 4.5.3; Van Hoof & Jongste 2007). This again supports the notion that once fixed, the built-up environment within (and presumably between, *cf.* section 6.4.3) Middle Bronze Age-B house-sites was not intended to change radically. In different aspects, such as the rebuilding of fences, granaries and complete houses *on their former locations and with identical orientations*, a tradition of 'having everything in its right place' may be reflected that is typical for this period of the Bronze Age (section 8.2.3.6; Arnoldussen & Fontijn 2006; Fontijn 2007).

Theoretically, Middle Bronze Age houses from different phases within this period could have been built to overlap at different angles,[124] but this occurred only rarely in (and beyond) the study-area during the Middle Bronze Age-B (table 7.2). Thus, while for the river area the density of Middle Bronze Age-B house-sites may have been high in suitable parts of the landscape (mean *c.* 55 m apart, *cf.* table 6.3), houses of comparable types did not overlap, but rather conformed in orientation to nearby houses (section 6.4.1, fig. 6.15). This pattern may be explained by two assumptions. The first assumption could be that the house-sites were periodically (*i.e.* after 50-100 years?) relocated and when such relocation occurred, 'new-comers' purposefully avoided the locations of former house-sites yet adopted their orientation. A second scenario is one in which during the Middle Bronze Age-B, new house-sites were erected next to other, *still functioning*, house-sites.[125] With this option, the orientation of the houses was either steered by that of the still present houses, or by the systems of land-parceling within which both older and younger houses were fitted (*cf.* fig. 7.9). To my mind, the second scenario is more appealing, although not much direct evidence can be put forward to support this. It does, however, have important consequences for the nature of Bronze Age settlement sites. Whereas the first option allows for wandering single house-sites (D: *wanderende Einzelhofe*), the second option implies the agglomeration of Middle Bronze Age-B house-sites (or in other words, the existence of hamlets or villages).

It is necessary to discusses whether there are any arguments in support of the presence of multi-house settlement sites. In the cases of Zijderveld and Eigenblok, the available dates for houses allow for contemporaneity, but do not unambiguously dictate it (sections 4.2 and 4.3.5). The fact that the boundaries of the built-up parts of the cultural landscape have not been reached in both excavations, despite trenches distributed across hundreds of meters, suggests that settlement sites in any case may have been rather extensive. A similar impression is obtained for some other sites, such as Bovenkarspel (fig. 7.8, outside the study area) and possibly Wijk bij Duurstede - De Horden, although for the latter the documented size is known to be an under-representation (especially in the western parts; Appendix IV).

For Wijk bij Duurstede - De Horden, I have argued that the ditch to the south of the Middle Bronze Age-B house-sites may have formed a settlement boundary (section 5.6, esp. fig. 5.55), as it partly delineates all Middle Bronze Age-B house-sites. No comparable features are known from other sites, which means that only the numbers of houses, their shared orientation and comparable dates may indicate that several of them were contemporaneous. For example, the four radiocarbon dates for the Middle Bronze Age-B occupation at De Horden (Appendix VI; Hessing 1991) suggest that habitation between 1410 and 1260 cal BC is probable.[126] Assuming a 50 years life-span for individual houses (section 3.4.2), one would expect three rather than 12 house-phases, suggesting that two or three

124 *E.g.* possibly at Hijken (Harsema 1991, 24 fig. 3), or the Middle Bronze Age to Late Bronze Age sites of Elp (fig. 8.3; Waterbolk 1965; 1987) and Angelslo-Emmerhout (Van der Waals & Butler 1976; Kooi 2008).

125 These houses may have been relocated from more distant areas, but more plausibly, were built by the same household (family?) or local community that occupied the former or nearby houses.

126 Based on the calibrated range of these four dates combined; 3069 ± 22 BP (see Appendix VI for details on the individual dates).

farms may have been contemporaneous. Along similar lines, it has been argued for Eigenblok that the six Middle Bronze Age-B houses uncovered there can be framed within a 35 to 205 year period (Jongste 2008, 105). Again using the 50 years life-span, this implies the presence of multiple, contemporary, house-sites. Unfortunately, it is generally unclear exactly how many houses were existing contemporaneously, and possibly not that relevant. What *is* relevant, is that it is very well possible that more than three house-sites functioned simultaneously at short distances, and that when houses were 'added', this was done with respect to prior established bi-axial systems of land-parceling (system of fences) and/or house-orientation. In such a system, individual house-sites may still have shifted locations, have gone into disuse, have changed function or new house-sites may have been added. These processes were, however, all undertaken with respect for, or within pre-existing systems of land-structuring (*cf.* section 8.2.2. Consequently, this is better described as a system of settlement dynamics involving gradual growth and shifts, rather than one of 'wandering farmsteads' (fig. 7.9).

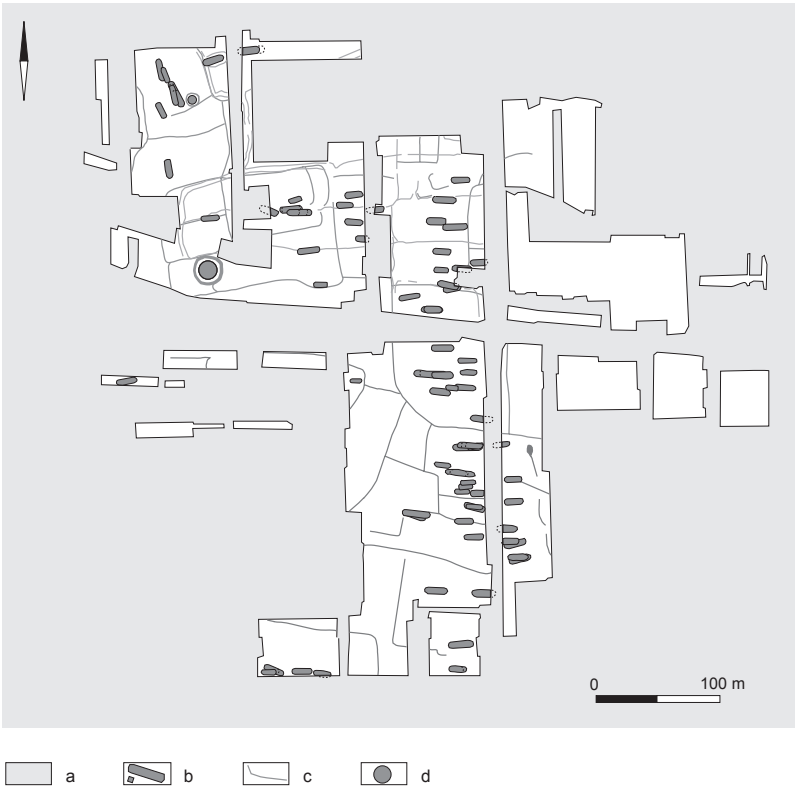

Fig. 7.8 Simplified interpretation of the Bronze Age cultural landscape at Bovenkarspel-Het Valkje (after Buurman 1996a, 16, fig. 5 and IJzereef 1989, 22). Note the extent of the settlement site and the density of houses.

a: not excavated; b: Bronze Age houses; c: Bronze Age ditches; d: pre-Bronze Age barrows.

7.3.3 Middle Bronze Age-B settlement preferences

Cultural factors

In the section above I have argued that settlement location preferences may have been (partly) based on the nature of the pre-existing cultural landscape. Funerary sites such as barrows, but also palisades or domestic refuse that was part of pre-Middle Bronze Age-B occupation periods may have been perceived as reflecting favorable signs for later established Middle Bronze Age-B settlement sites. In addition, I have argued that the built-up part of the cultural landscape may have offered an extensive spatial framework *within which* agglomerations of Middle Bronze Age-B house-sites could evolve. The creation of such agglomerations may have involved shifts of households over considerable distances (*e.g.* unrelated households joining), but I feel that it predominantly reflects small scale expansion and relocation of already present communities or households (fig. 7.9, B). The arguments for this are, however, all indirect:

(1) In the placement and orientation of the houses, conformity to the pre-existing landscape structuring – and thus (broad) contemporaneity – is reflected (section 6.4.1);

(2) the available radiocarbon dates for conforming houses do not argue against contemporaneity (Chapter 4, Appendices I-VI);

(3) in autarkic agraricultural communities, the presence of a neighbour (whether related or not) is an important factor or even prerequisite as households, particularly beginning households, often cannot cope without material help or labour offered by neighbouring households (section 3.4.1).

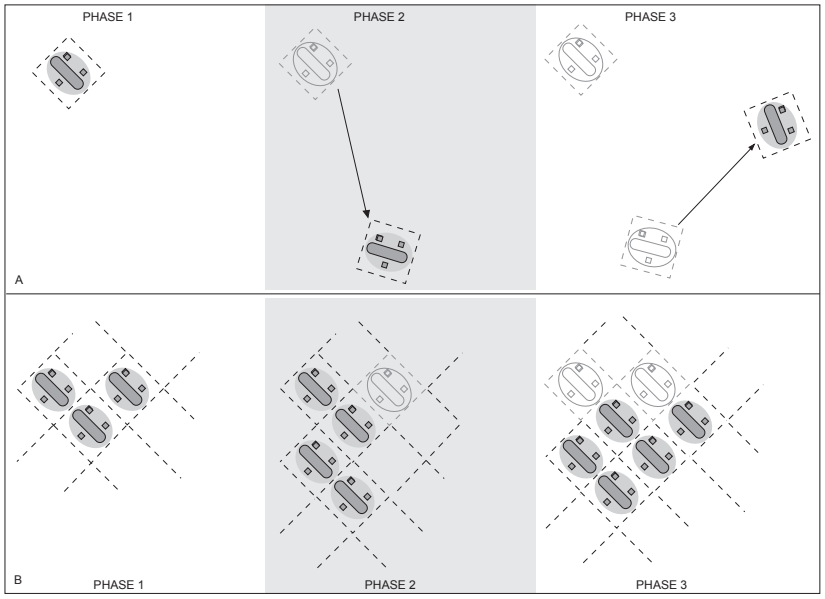

Fig. 7.9 MBA-B house-sites dynamics as represented by the models of 'wandering farmsteads' (top) and 'growth-and-shift' (below).

The role of the physical landscape and its dynamics

The role of cultural factors in determining Middle Bronze Age-B settlement site locations can only be understood as complementary to the determining roles of properties of the physical landscape. Settlement site locations may thus have been decided upon somewhere midway the spectrum between cultural determinism and ecological determinism. These societies were not uniformly cloning culture irrespective of the physical landscape, nor did the properties of the physical landscape determine at which locations what activities needed to take place. However, by both the cultural and physical realms, boundaries were set to human usage of the landscape (Louwe Kooijmans 1993a, 77). For instance, at perfect hunting grounds, such behavior may have been restricted by cultural regulations (*e.g.* taboos), just as settling vast coversand areas could render certain culturally acceptable options (*e.g.* fishing or fowling) improbable. But exactly what choices were made by Middle Bronze Age-B communities in the study area?

It is clear from figure 7.10 that during the Middle Bronze Age-B, an increase occurred in the types of locations of settlement sites. In nearly all types of landscapes, of different fluvial activity and genesis, Middle Bronze Age-B settlement sites can be outlined. Only for the *donken* and on the levee deposits of active systems proper, is evidence limited to absent (fig. 7.10). Despite the fact that problems of definition (section 3.2.1) and recognizability (sections 5.2.1-5.2.2) affect the seemingly dramatic increase in the clarity of the evidence between the Middle Bronze Age-A and the Middle Bronze Age-B, the image of widespread and ubiquitous Middle Bronze Age-B settlement sites remains. Nearly all, rather different (sections 2.7.1-2.7.2) types of fluvial landscapes were chosen for settlement, and no significant difference in the nature of the settlement sites can be outlined between these types (*cf.* Chapter 4; 6).

Interpreting this abundant presence in such a wide variety of landscapes is difficult. Possibly, the system of 'true mixed farming' (*sensu* Louwe Kooijmans 1993a, 104) could be successfully pursued in all these specific environments (*i.e.* an identical subsistence strategy was utilized in varied landscapes), or alternatively; the 'true mixed farming' strategy was sufficiently open to manipulation to allow a wide range of environments to be used (*i.e.* different strategies applied in different environments). Most likely, these two points-of-view are extremes between which the realistic scenarios should be placed. The core of subsistence strategy will have been combined (and interdependent?) livestock rearing and crop-cultivation. Both the composition or relative dominance of livestock versus crops, and

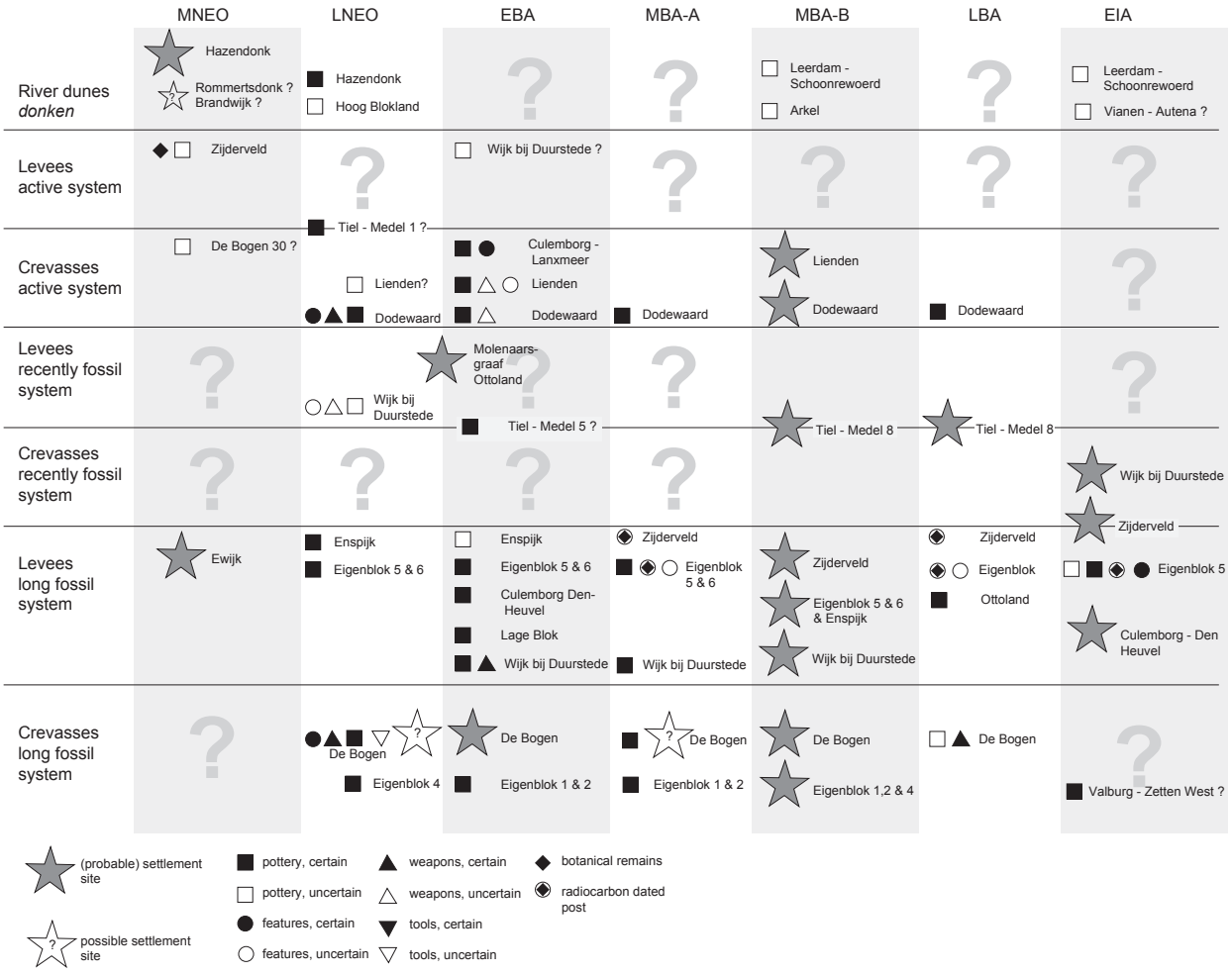

Fig. 7.10 Types of fluvial environments (y-axis) and the documented nature of their usage in different periods (x-axis). For references to the publications of the sites quoted see Chapter 4, Appendices I-VI and Louwe Kooijmans 1974; Verbruggen 1992; Out 2007. Systems classified as 'long fossil' were generally inactive for more than two centuries.

the use of other natural resources exploitable in the vicinity, may have been determined by variations in the physical landscape in the directly accessible surroundings of Middle Bronze Age-B settlement sites. Considering the similar livestock composition spectra and recurrent crop types for sites from different settings (fig. 7.11), such differences are variations on a theme, rather than categorically different strategies.

In Chapter 2, I have argued that crevasse splay deposits and levees of inactive fluvial systems differed in use-potential from crevasse splay deposits and levees of active fluvial systems (sections 2.3; 2.7). Nonetheless, all but the levees of active systems provided suitable settlement locations. With both active and inactive systems, the floodbasins will – if grazed – have provided areas rich in grasses on which cattle could be fed. It remains to be seen whether in the peat-rich areas to the west of the study area, similar possibilities existed. There, rivers were more frequently of the anastomosing type, with small levees and limited lateral movement (sections 2.3.6; 2.7.3). This means that fewer avulsions took place, that the number of overall coeval channel belts may have been lower and that the opportunities for stacked crevasse splay landscapes to form were also smaller. Compared to within the study area, a relatively smaller surface area was available, which was moreover more severely affected by peat-growth and its spatial distribution was more confined to that of the river channels proper. One may also question whether the *donken*, whose surface area was ever decreasing through ongoing sedimentation and/or peat growth, offered a sufficient(ly accessible) area of grazing ground for livestock herding as desired by Middle Bronze Age-B communities.

site	fluvial dynamics	NDB	Bos (n)	(% NDB)	Sus (n)	(% NDB)	Ovic. (n)	(% NDB)	Equus (n)	Canis (n)	Wild (n)	Fish (n)	Birds (n)	Hor. vulg.	Trit. dic.	Trit. aes.	Ave na	ard-marks	references
Lienden	crevasse splay of active fluvial system	3054	2023	66	432	14	556	18	5	1	10	152	3	19	11	0	-	-	Buitenhuis 2002
Dodewaard site 157	crevasse splay of active fluvial system	259	219	85	22	8	17	7	1	0	7	1	1	-	-	-	-	-	Theunissen & Hulst 1999a
Tiel - Medel site 1 and 8	levee and/or crevasses of recently (? *c.* 0.2 kA) fossil system, active system at 1.5-2 km	1054	839	80	95	9	105	10	5	10	4	1	-	- (+)	- (+)	- (+)	-	-	Buitenhuis 2003; De Roller 2003; Cavallo & Van Groenesteijn 2007; Bakels 2007
Wijk bij Duurstede	long (*c.* 0.7 kA) fossil levee deposits, active system at < 500 m	200	161	81	12	6	16	8	9	5	30	-	-	+	+	-	-	-	Letterlé 1985; Hessing 1991
Zijderveld	long (*c.* 1.2 to 0.8 kA) fossil levee deposits, active system at 3.5-7 km	521	488	94	16	3	12	2	2	3	5	0	1	++	+	-	-	-	Theunissen & Hulst 1999b; Bakels 2005; Cavallo 2005
Eigenblok sites 5 to 6	long (*c.* 1.6 kA) fossil levee deposits, possible active system at < 500 m	7150	5669	75	772	14	707	10	2	0	44	7	0	2008	58	0	-	++	Van Dijk 2002; Brinkkemper *et al.* 2002
Enspijk	long (unclear; possibly *c.* 1.6 kA) fossil levee deposits, active system at 6 km	136	95	70	5	4	36	26	0	0	0	0	6	69	8	-	1	-	Schnitger 2005; Hänninen 2005
Eigenblok sites 1 to 4	long (*c.* 1.6 kA) fossil crevasse splay, possible active system < 500 m	321	213	66	57	18	47	15	3	1	0	14	14	152	9	736	-	-	Van Dijk 2002; Brinkkemper *et al.* 2002
De Bogen sites 28 to 31	long (*c.* 1.8 kA) fossil crevasse splay deposits, active system at < 500 m	7633	4446	58	1638	21	1385	18	1	138	47	187	39	745	457	-	-	- / +	Buitenhuis 2001; Stuijts 2001; Van Dijk, Esser & Zeiler 2002; Hänninen & Van Haaster 2002

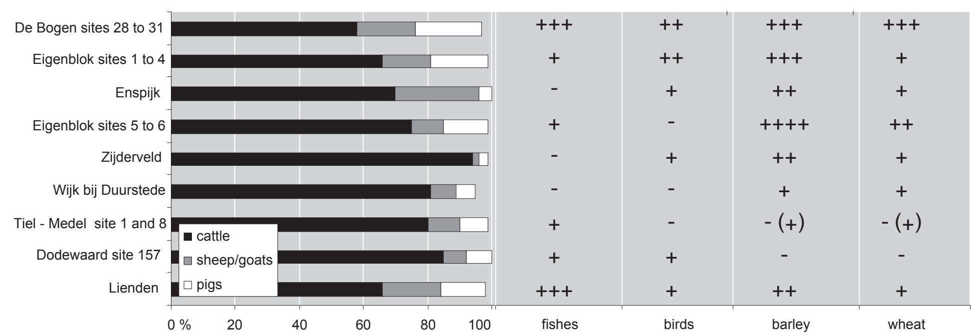

Fig. 7.11 Livestock composition for Middle Bronze Age-B settlement sites in the study area in numbers and as percentages of the fragments identified for the five main domesticated species (NDB; *Bos Taurus*, *Ovis/Capra*, *Sus domesticus*, *Canis familiaris*, *Equus caballus*), the number of fragments for a series of wild species (*Bos primigenius*, *Sus scrofa*, *Ursus arctos*, *Cervus elaphus*, *Capreolus capreolus*, *Alces alces*, *Castor fiber*, *Lutra lutra*, *Martes* sp. and *Putorius putorius*), fishes and birds. Certain numbers of identifications for four main species of cereals (*Hordeum vulgare*, *Triticum dicoccon*, *Triticum aestivum* and *Avena* sp.) and the presence or absence of presumably Middle Bronze Age-B ard-marks is also listed. A simplified interpretation is offered in the lower half of this figure.

Crop-cultivation is also bounded by some properties of the physical landscape. In Chapter 2, I have argued that fluvial sedimentary environments are rich in nutrients, which – in active fluvial settings – are frequently replenished. The lithology of levees (consisting of sandy to silty clay and fine sand; table 2.1) and especially crevasse splay deposits (similar constituents, but much more locally variable; table 2.1) offered a combination of mineral richness and adequate drainage that would have supported different types of, and prolonged (section 3.4.4), crop-cultivation. On active systems, the risk of flooding may have limited the cropping strategies (*e.g.* no winter cereals) and locations of the fields (*e.g.* only the higher locations were used), but the site of Lienden shows that cereals were present (and produced?) in such environments.[127]

River dunes, or *donken*, are characterized by a different lithology (fine to coarse sand, only incidentally loam-rich, which is of a poorer mineral composition (De Mulder *et al.* 2003, 197-202; 346-350)). This also possibly affected the possibilities for (prolonged) crop-cultivation. Moreover, no or only partial replenishing of soil-nutrients by flooding took place at *donken*, while their highest parts were subjected to the leeching-out of minerals and decalcification since their (generally Late Pleistocene to Early Holocene) period of formation. It may be just this combination of a smaller surface area (and fewer possibilities for transport and communication), longer-term soil

127 De Roller, Korf & Mook-Kamps 2002, *cf.* Van Haaster in Bulten 1998c, 50; Hänninen in Sier & Smits 1998, 44.

formation and the absence of nutrient-rich sedimentation, that rendered the river dunes less ideal habitation sites during the Middle Bronze Age-B. As only few river dunes with remains from the Middle Bronze Age-B have been investigated, the distortion caused by research intensity cannot yet be assessed. Presumably, future research may show that some river dunes were indeed settled during the Middle Bronze Age-B. I would suspect these river dunes to be situated close to (inactive) fluvial systems, and possibly in locations were aeolian river dune deposits underlie a thin fluvial cover. This would create a nutrient-rich, subsidence-free and logistically well-conected area comparable to those of the levee and crevasse-splay deposits.[128]

7.3.4 Dynamic landscapes?

Various reasons why the levee- and crevasse-splay deposits in the study area were favoured settlement site locations have been forwarded in the sections above. These arguments all hinge on the interplay between the culturally determined choices for types of land use and the possibilities offered by the physical environment. Levees and crevasse-splay deposits offered (sometimes extensive) areas that could be easily settled, that were nutrient-rich and provided good crop-cultivation and travel possibilities (sections 2.7.1-2.7.2). In the lower-lying parts, where levee and/or crevasse-splay deposits merged into the floodbasins, excellent pastures were present. Most probably, the possibilities thus provided to exploit varied resources at short distances was one of the chief factors drawing Middle Bronze Age-B communities into these landscapes. The erratic occurrence and distribution of crevasse splay formation created a landscape that was compartmentalized on a very local scale. Especially in the study area, Middle Bronze Age-B occupation is perhaps better regarded as being 'webbed' in nature rather than as being bound to the 'threads' of the levee deposits proper.[129] The detailed palaeogeographical coring campaign executed at Eigenblok provides an example of the degree of local variation present in such 'mosaic' landscapes (fig. 7.12; Van Zijverden 2002a; 2004b).

The darker shaded areas in figure 7.12 represent clayey to peaty more lower-lying areas, with open water, reed and alder carr that were suitable for fishing and the collecting of fodder, thatch, wood and wattle. The lighter shades are the fertile more higher, drier and sandy areas suitable for habitation, crop cultivation, exploitation of forest resources *et cetera*. The intermediate areas represent grassland areas interspersed with alder and willow shrubs, which are excellent pastures. As the Eigenblok fluvial system ceased fluvial activity around 3340-2930 cal BC (Berendsen & Stouthamer 2001, 199) the observed Middle Bronze Age-B occupation took place in an already centuries old fluvial landscape, *i.e.* an area of limited fluvial dynamics. Nonetheless, another fluvial system at *c.* 500 m to the south may have been active (Van Zijverden 2002a; 2004b). But to what extent may Middle Bronze Age-B farmers themselves have considered habitation at this site – and the other Middle Bronze Age-B settlement sites in the study area – to have taken place in dynamic landscapes?

In Chapter 2, I have discussed the perceptibility of various fluvial processes in relation to human time-scales in more detail (section 2.4). Consequently, here only the key elements need to be recalled. From a human perspective – which is here for convenience equated with a human generation of *c.* 30 years – the landscape was perhaps not that dynamic to the eyes of its Middle Bronze Age-B occupants. The Bronze Age farming communities were well-acquainted with the annual flooding of the rivers during late autumn and spring (section 2.4.2). Generally, only the lower-lying parts of the landscape were affected and the water level dropped again after several weeks. Only very rarely (*i.e.* once in a generation) did extreme (*e.g.* 150 to 200 % of normal discharge) flooding take place. During such periods of peak-discharge, excess flooding, re-opening of blocked channels and crevasse-inlets and new crevasse-splay formation could take place. As most sites were situated at some distance (*i.e.* several hundreds of meters) from the active channels, these processes are unlikely to have been witnessed by Middle Bronze Age-B occupants in the first place, let alone to have been catastrophic.

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128 Note that not all crevasse-splays and not even all levee deposits are subsidence free, as they may not everywhere have scoured into the Pleistocene subsoil (*cf.* fig. 2.9; 2.12; Makaske 1998, Appendix 3).

129 However, it is this image of narrow 'threads' that is best understood (Berendsen & Stouthamer 2001) and has made its way into heritage tools such as the IKAW (Deeben *et al*. 1997; Deeben & Wiemer 1999; Deeben, Hallewas & Maarleveld 2002, esp. 25), although this map – in using paleogeographic base maps compiled for other purposes - grossly underestimates the areas available for human use (*cf.* fig. 2.8 and 7.12, *cf.* section 8.3.2; Verhagen 2007, 129-132).

Fig. 7.12 Example of a compartmentalized, 'mosaic' Middle Bronze Age-B landscape and its occupation traces at Eigenblok (after Van Zijverden 2004b). Depicted is a soil-type map showing the more lower lying peaty to clayey wetter zones with some patches of open water (dark) and the higher, drier sandy soils (lighter). A cut-out of A is represented at a more detailed scale in B.

a: soil-types, b: levee deposits of the Eigenblok fluvial system, c: excavation trenches, d: Middle Bronze Age-B occupation traces, e: presumably Middle Bronze Age-B traces documented in coring campaigns (small cross: tentative fields, large cross: possible settlement sites, bold cross: presumable settlement sites).

The sites of Lienden and Dodewaard, by comparison, appear to be 'inconveniently' close to active systems. Yet here as well, the frequency and risk of re-working of the fluvial micro-topographic landscape may have been low. At Lienden, the Middle Bronze Age-B occupation was situated on crevasse splays that had formed shortly before (possibly during the Middle Bronze Age-A; Van Dinter 2002, 50, *cf.* fig. 4.32). A residual crevasse gully associated with this phase of crevasse formation appears to have gradually silted-up, with only minor periods of flooding (Van Dinter 2002, 46).[130] This means that Middle Bronze Age-B farmers accepted that parts of the adjacent floodbasin were annually flooded and partly submerged, and that this need not have rendered habitation impossible. At Dodewaard, the fluvial genesis of the micro-region is not yet fully understood (Van Zijverden 2003b; Appendix VI). Based on the studies by Steenbeek (1990) and Van Zijverden (2003b), it is clear that complex sequences of crevasse-splay formation and fluvial erosion took place prior to the Middle Bronze Age-B in the micro-region, but the exact spatial distribution and chronology of these processes is not yet known. During the Middle Bronze Age-B, however, fluvial activity seems to have been limited, as only some floodbasin sedimentation took place (Steenbeek 1990, 174; 185; 193). Considering the fact that the main Dodewaard excavation (Theunissen & Hulst 1999a) is situated at the convex meander peak, it is probable that at the time of occupation, the active course was meandering in the other direction and may have been situated as much as 1.2 km to the south (fig. 4.38; Appendix VI). The preservation of the site itself is proof that no erosive lateral meandering occurred at that part of the micro-region. Near the end of the Middle Bronze Age-B, alder carrs were restored and peaty to strongly humic clay (indicating reduced to absent sedimentation) could be found in the floodbasins near the Dodewaard site (Steenbeek 1990, 194).

In short, there is evidence at the two sites situated near active river courses, that the situation during the Middle Bronze Age-B need not have been much different from those sites situated on the systems that had become inactive centuries prior to Middle Bronze Age-B occupation. The gradual 'drowning' of the landscape, through combined subsidence and continued sedimentation at Meteren - De Bogen and Rumpt - Eigenblok would not have been (considered) catastrophic by the Middle Bronze Age-B occupants, as these processes only very slowly decreased the surface area (but see Van Zijverden 2002a, 70; 75) and the presumed main uses of these areas (raw-material procurement, herding, fishing?) were not bound to specific spots.[131] Rather, it seems that habitation was much more hindered – or even rendered impossible – once continued sedimentation occurred within the settlement site area. This may have been caused by new crevasse formation,[132] by reactivation of an older residual gully,[133] or by a combination of these processes.[134] To conclude, while annual and incidental flooding will not have ended Middle Bronze Age-B occupation, prolonged deposition of floodbasin sediments and crevasse-splay formation within the settlement site area or its direct vicinity could have (locally) rendered successful agriculture (temporarily) impossible and this in turn may have caused people to relocate.

7.3.5 Man-landscape interactions

In section 7.3.3 I have argued that subsistence (and social) circumstances during the Middle Bronze Age-B were adequate and/or adaptable enough to settle a wide range of landscapes, of different geological dynamics (*cf.* Arnoldussen & Fokkens 2008). But this should not be taken to signify that Middle Bronze Age-B settlements were structured irrespective of properties of the physical landscape. To the contrary, there are several examples of settlement sites where the distribution and orientation of settlement site elements may have been influenced or even steered by properties of the physical landscape. For example, at Zijderveld the orientation of the houses and many of the fences is identical to that of the Zijderveld fluvial system, and presumably more significantly, its residual gully that was visible as a marshy depression (perhaps seasonally waterlogged) at the time of Middle Bronze Age-B occupation (fig. 7.13).

130 The later crevasse formation that eroded much of the finds-layer at Lienden is dated to *c.* 1220-790 cal BC, and it is related to the start of sedimentation by the Echteld channel to the south, which reactivated the former Westerveld residual gully (Van Dinter 2002, 50; Berendsen & Stouthamer 2001, 198; Appendix V).

131 Sections 2.3.5; 2.4.3; 4.3.4; 4.4.3; 4.7.3; Appendix II-III; VI.

132 *E.g.* at De Bogen (Van Zijverden 2002b, 87-88; 2004b, Appendix III).

133 *E.g.* at Zijderveld (Knippenberg & Jongste 2005, 25; Van Zijverden 2003a; Appendix I) and Eigenblok (Van Zijverden 2004a; Appendix II).

134 *E.g.* at Wijk bij Duurstede - De Horden (Steenbeek 1990, 92, 188; Appendix IV) and Lienden (Van Dinter 2002, 48; Appendix V).

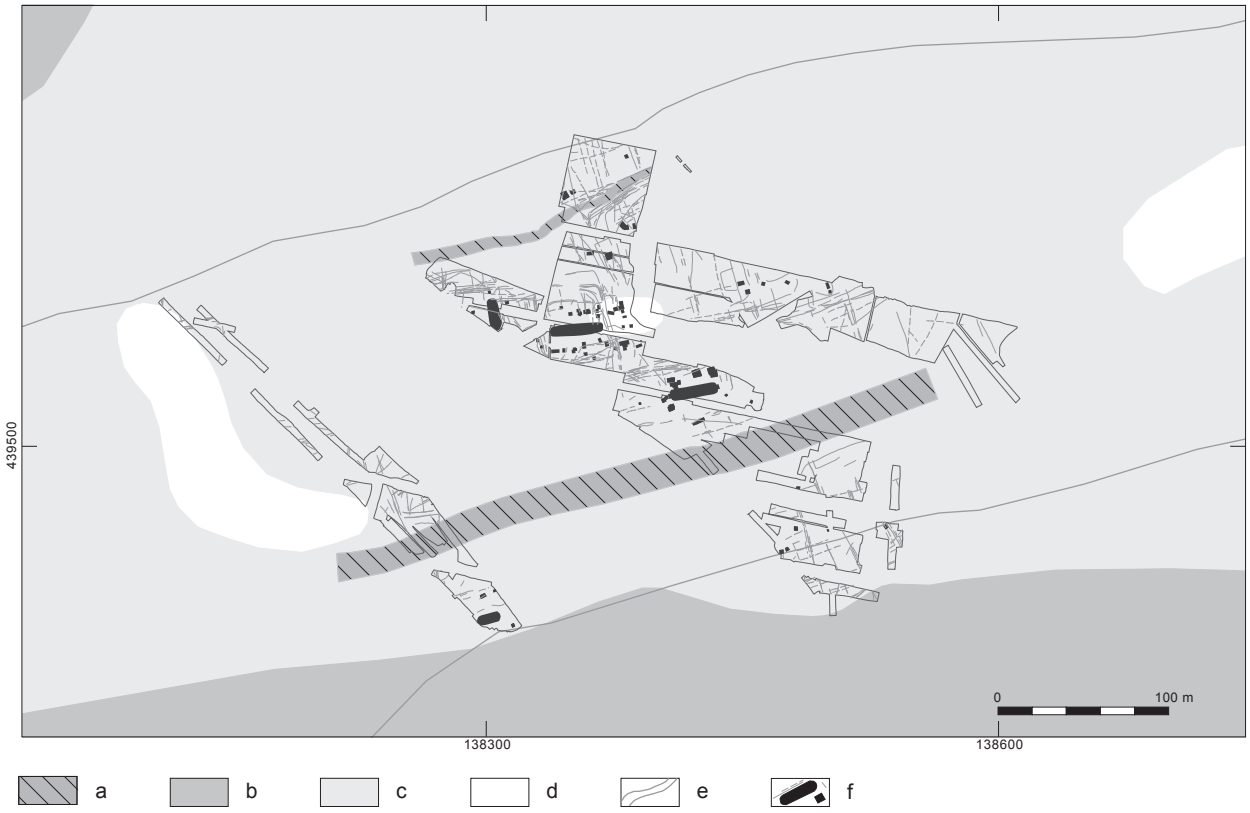

Fig. 7.13 Palaeogeographical map and occupation traces at Zijderveld during the Middle Bronze Age-B (after Van Zijverden 2003a; Knippenberg & Jongste 2005; Van Beurden 2008, *cf.* fig. 4.4).

a: residual crevasse gully (north) and Zijderveld fluvial system residual gully, b: alder carr and wet meadows, c: alluvial hardwood forest; dryer; poplar, ash, alder and garden plots (?), d: highest parts; like c, possibly more oak trees?, e: outline of channel deposits of the Zijderveld fluvial system, f: Middle Bronze Age-B settlement site elements.

As only a small part of the levee deposits of the Zijderveld fluvial system has been excavated, it is not known whether this correspondence between house-orientation and the orientation of the residual gully is also present in other parts. Two kilometers to the west of the excavated area, the fluvial system bends sharply to the north (*cf.* Appendix I, fig. I.5). It would be informative to open up an area there to see whether – if present – Middle Bronze Age-B settlement site elements such as fences and houses followed the (different) orientation of the residual gully there, or alternatively, whether the prese(n)t orientation was continued. There is some evidence that may support the latter scenario.

For example, at Eigenblok, most house-sites conformed to a NW-SE system of orientation that appears to cross-cut height contours and palaeogeographical zones in parts of the micro-topographic landscape (*cf.* fig. 7.12, B; Hielkema, Prangsma & Jongste 2002). While in some parts fence lines may have followed contours of the micro-topographic landscape (corresponding to vegetation zones?), this occurred only incidentally (*contra* Jongste 2002b, 612). Instead, most fences seem to have been part of relatively straight, bi-axial parceling systems that included, yet surpassed, individual house-sites (sections 5.5 and 6.4.3). At Eigenblok house-site 1, an exception to the rule may be present. There, the orientation of the westernmost house and fences deviates from the other four house-sites (fig. 7.12, B). It is not known whether this was done to deliberately create correspondence with landscape geometry or whether other factors caused this.[135] At Meteren - De Bogen, a comparable situation existed. There as well, the local variations in height and morphology of the crevasse splay underlying the Middle Bronze Age-B occupation traces are not reflected by the orientation of the houses. Rather, all houses conform more or less (fig. 6.45) to the dominant

135 One may even question whether this house was contemporaneous to the other houses, as dates are available only for a surrounding fence and two outbuildings (Jongste 2002a, 35; Appendix II).

W-E axis of orientation (fig. 4.18). Here as well, fence systems – although less well preserved – may have been instrumental in carrying a system of orientation across an extensive area (section 6.4.3).

At Enspijk, three houses were uncovered on top of the Enspijk/Hooiblok fluvial system's channel deposits (section 4.3.3; Ter Wal 2005b). The orientation of these houses may be related (similar or perpendicular; fig. 7.14, A) to that of the river course, but as only a narrow strip has been excavated and the morphology of these deposits is not mapped with adequate detail yet (Feiken 2005) this interpretation remains tentative. More evident is the cluster of fence-lines that seems to have been placed in – and along – the residual gully in the south (fig. 7.14, A-B). These fence-lines may have delimited the wetter, lowermost part of the residual channel which was filled with sandy to silty clay (Feiken 2005; Ter Wal 2005b, 16-17; 25).

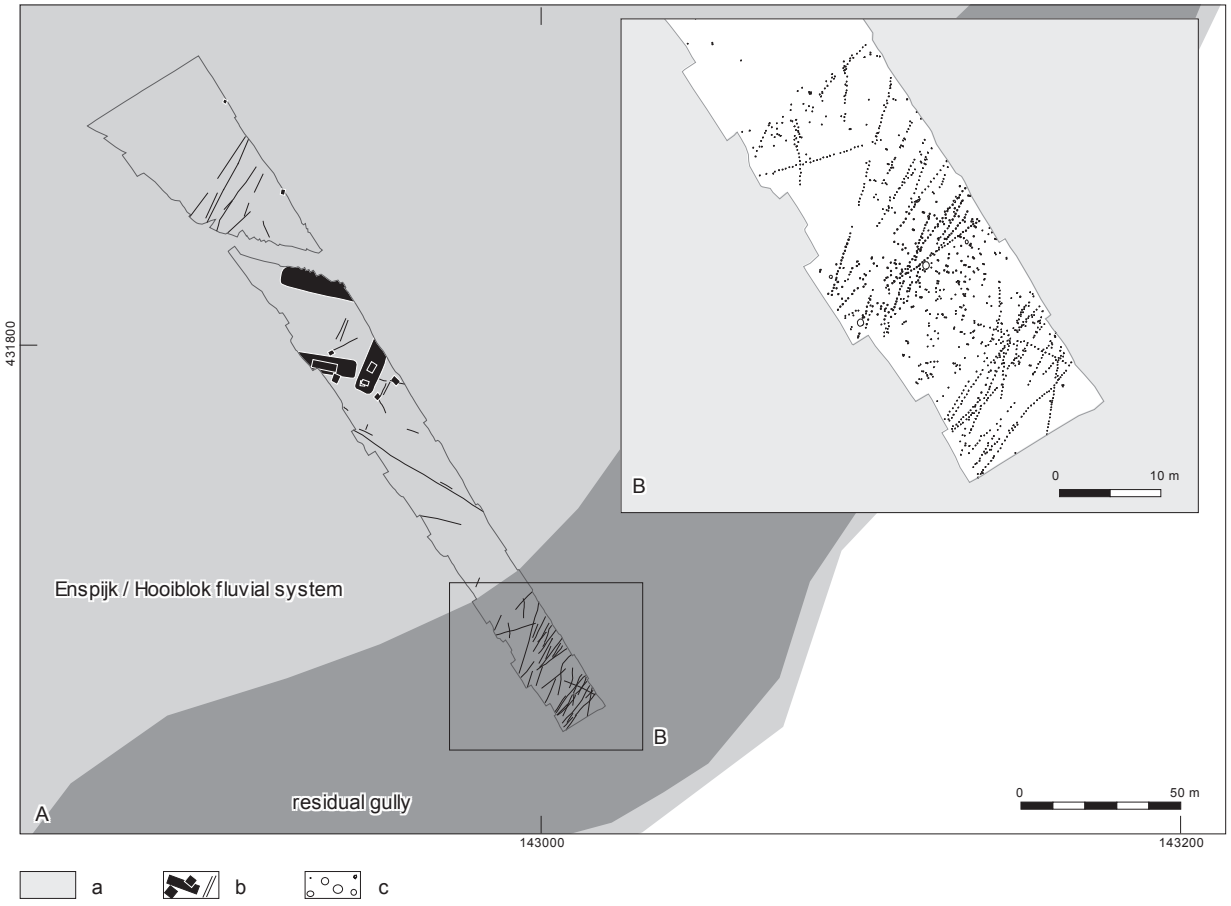

Fig. 7.14 Overview (A) and detail (B) of the Middle Bronze Age structures at Enspijk – A2 / Op- en Afrit Geldermalsen in relation to the underlying channel bed deposits and residual gully (after Berendsen & Stouthamer 2001 and Feiken 2005, 15 fig. 6).

a: not excavated, b: structures (houses, outbuildings, fences), c: features, mostly fences.

A final example of possible Bronze Age landscape referencing may be the ditch at Wijk bij Duurstede - De Horden. The shape and extent of this *c.* 190 m long possible settlement site boundary ditch may have been inspired by – or may even be mimicking – the trajectory of a swale gully situated 100 to 200 m to the south of it (fig. 5.55). Unfortunately, the dating of this ditch to the Middle Bronze Age-B is insecure (section 5.6; Appendix IV).

In addition to these possible examples of landscape referencing, the distribution of various settlement site elements may have been related to properties of the landscape (see Chapter 4; Chapter 6). For instance, wells are found clustered in locations where good accessible aquifers were presumably found (sections 5.7; 6.4.4). A more general example is the fact that the highest density of features (and in cases of adequate preservation also finds) is

generally bound to the highest parts of the micro-topographic landscape, which were preferred house-site locations. The more lower-lying areas generally only supported fences and few structures, some of which may have been granary-type outbuildings. Evidently, relative height (*i.e.* in relation to the mean level of floodbasin sedimentation) affected feature distribution. In a fluvial setting, relative height is connected to lithogenetic facies. The energetic advantage of levee-breeches into the lower-lying floodbasin means that crevasses are by definition mostly lower than levee deposits (section 2.3.3).

Barrows, for example, have thus far only been found on sites situated on levee deposits, rather than on crevasse-splay deposits. First, it should be stressed that the numbers of barrows discovered is very low, which diminishes representativeness.[136] Nonetheless, there is evidence that, outside the river area, barrow mound(period)s were sometimes erected on the highest parts of the micro-topographic landscape and sometimes natural elevations were used (section 5.9, esp. p. 271). If this preference also applied to the river area, it would only be normal for (pre-Middle Bronze Age-B) communities to construct their barrows on the somewhat higher levees.

Ard-marks have thus far also only been found on sites situated on top of levee deposits. Their absence on the smaller, compartmentalized, mosaic crevasse-splay landscape might be explained by assuming that a minimum field size for ard-ploughing to be efficient may not have been met there. However, I would argue that numerous crevasse-splays would have offered adequate space, and that it is predominantly preservation conditions and methodological issues that have rendered such more shallow traces invisible.

There is, however, a serious risk of (mis)interpreting the distribution of Bronze Age settlement sites remains in the river area as being determined, rather than as affected or bound, by landscape characteristics such as lithology, morphology and dynamics. The prehistoric occupants were people who were likely to have stayed two generations (or more) on the same spot or in the same micro-region, and who were intimately familiar with the possibilities and limitations posed by such landscape characteristics. Probably, zones in the landscape that differed in lithology, morphology and dynamics from favoured settlement site locations, were put to optimum use as well (*e.g.* clay extraction, firing activities, food collecting and/or processing *et cetera*). This usage may however differ significantly in nature, and consequently in archaeological visibility, from that of settlements. Despite this, the low representativity of such uses in our perceptions of Middle Bronze Age-B everyday life is partly self-inflicted. By using prospective strategies that have best detection rates for settlement sites (section 2.7), by policy decisions that favour these as well (*supra*; 'maximum archaeology-per-euro') and by the frequently confined scale of excavations, archaeologists actively contribute to an overly home-based view of Middle Bronze Age-B societies. Such imbalances can only be redressed by research projects focused at a (cultural) landscape scale and that allow for more differentiated, dynamic, models of landscape usage.

7.3.6 Middle Bronze Age-B settlement dynamics in supra-regional perspective

Having discussed various aspects of Middle Bronze Age-B settlement dynamics, it is now time to place the observed patterns in supra-regional perspective. Possibly, in other (geogenetic) regions of the Netherlands the Middle Bronze Age-B settlement dynamics were of a different character. If in these areas 'wandering farmsteads' were the norm, one may expect these regions to show less (or no) house-sites with multiple house-phases. In addition, regional differences may become visible from differences in the frequencies with which extensions, rebuilding or overbuilding occurred (*cf.* fig. 3.3). To this end, an inventory of Middle Bronze Age-B houses and house-sites from different geogentic regions has been compiled. As for some areas certain aspects (such as rebuilding, or the percentage of single-phased house-sites) have been published but no full detailed publications are available, the data set varies in size for the different topics. However, as a general indication, a maximum total of 308 to 350 Middle Bronze Age-B house(-site)s was used in the different comparisons (table 7.2).

136 A total of four is known; Meteren - De Bogen site 45 (fig. 4.15; Hielkema, Brokke & Meijlink 2002), Rumpt - Eigenblok site 6 and possibly site 5 (fig. 8.6; Hielkema, Prangsma & Jongste 2002), Wijk bij Duurstede - De Horden (fig. 4.28; Hessing 1989). Note that the construction phases of all these barrows may pre-date the Middle Bronze Age-B.

	river area (n)	river area (%)	southern NL (n)	southern NL (%)	easthern NL (n)	easthern NL (%)	northern NL (n)	northern NL (%)	West-Friesland (n)	West-Friesland (%)	ice-pushed hills (n)	ice-pushed hills (%)	coastal area (n)	coastal area (%)	min. total (n)	min. total %	max. total (n)	max. total %
(n)	59	100%	26	100%	16	100%	51 (93)	100%	138 (95)	100%	4	100%	14	100%	308	100%	308 (350)	100%
repairs	22	37 %	8-9	31 %	4	25 %	17	33 %	n.a.	n.a.	2	50 %	5	36 %	58 (170)	34 %	59 (170)	35 %
single-phased	42-45	71-81 %	22	85 %	13	81 %	57 (93)	61 %	44 (95)	46 %	3	75 %	0	0 %	181 (307)	59 %	184 (307)	60 %
multi-phased	14-17	19-29 %	4	15 %	3	19 %	36 (93)	39 %	51(95)	54 %	1	25 %	14	100 %	123 (307)	40 %	126 (307)	41 %
extended	2-4	3-5 %	2	8 %	1	6 %	16	31 %	9 (90)	10 %	1	25 %	1	7 %	32 (260)	12 %	34 (260)	12 %
rebuilt	6-10	10-17 %	2-4	7.5-15 %	2	12.5 %	0-3 (93)	0-3 %	14 (90)	16 %	0	0 %	5	36 %	29 (288)	10 %	38 (288)	13 %
overbuilt by house	3	5 %	0	0 %	0	0 %	17 (93)	18 %	11 (90)	12 %	0	0 %	2	14 %	33 (288)	11 %	33 (288)	11 %
overbuilt by outbuilding	12	20 %	0-1	0 - 4%	0-1	0-6 %	n.a.	n.a.	n.a.	n.a.	1	25 %	4	28 %	12 (67)	18 %	13 (67)	19 %

Table 7.2 Frequency and percentages for different house- and house-site properties compared across the different geogenetic regions.

Regional comparisons

From table 7.2 it is clear that the amount of archaeologically arguable repairs is similar for all regions (mean *c.* 34-35 % of the houses), and the higher value in the ice-pushed hills areas is a side-effect of the low overall number of houses known there. If one looks at the composition of single-phased versus multi-phased house-sites, much more regional variation is visible. Whereas in the river area *c.* 20-30 % of the house-sites were multi-phased, in the southern coversand area this occurred only in 15 % of cases. In the eastern coversand area and ice-pushed hills, figures may be comparable, but the overall number of documented cases there is low. For the northern Netherlands and West-Friesland similar numbers of house-sites as in the river area have been uncovered, but in these regions as many as *c.* 40 to 54 % of the house-sites showed more than one house-phase. The (near-)coastal areas present an even more extreme situation, as here all house-sites had more than one house-phase. The importance of these figures needs to be stressed explicitly: there is no region where exclusively single-phased house-sites (as to be expected with a wandering farmsteads model) occur. In the various regions, quite different settlement dynamics applied to between 15 % to 100% of the Middle Bronze Age-B house-sites, but a mean figure of 40 % may be forwarded. This means that for all Dutch Middle Bronze Age-B house-sites, in almost half of the cases single-phased occupation as predicted by the wandering-farmstead model does not apply. Yet evidently, in some regions – such as the southern Netherlands – single-phased house-sites are the norm. Moreover, periodical relocation may have been the true background to this patterning. What is important to stress once again here, that it is not the *mechanism* of wandering farmsteads that is criticized in this study, but rather its underlying assumptions, presumed periodicity and exclusiveness (*cf.* section 3.4 and table 7.2). Complementary to single-phased house-sites, multi-phased house-sites were part and parcel of Bronze Age settlement dynamics in most regions in The Netherlands during the Middle Bronze Age-B.

There remains considerable regional differentiation in the processes that caused house-sites to be multi-phased in nature. In the Dutch river area, a significant percentage (*c.* 10-17 %) of the houses were rebuilt, as has already been discussed above (*cf.* figs. 4.27; fig. 7.7). In addition, many cases of outbuildings overlapping houses were recorded. Some of thesecases of structural overlapping may have been deliberate (*cf.* 4.29), but particularly for those that deviate strongly in orientation, it is probable that these outbuildings belonged to another (younger?) use-phase of the site. Rebuilding of houses on the same house-site occurred in nearly all regions, but occurred with comparable frequency in West-Friesland (*c.* 16 %) and possibly in the coastal areas (*c.* 36 %; table 7.2). That this is no statistical artefact is shown by the values for the northern Netherlands, where large numbers of house-sites are known, yet rebuilding was rare (*c.* 0-3 %). For the southern and eastern Netherlands, the data set is rather small, so that the mean of *c.* 11 % rebuilt houses remains tentative. It is striking that rebuilding was more frequent in those areas (*i.e.* the river area, the coastal zone and West-Friesland) where houses with 'type A' roof-bearing frames were dominant (88 % or 100 %; table 5.6). Possibly, these areas were not that different in their settlement dynamics (*cf.*

Fokkens 2005d, 75) and it is tempting to speculate whether easy riverine and coastal contacts may have aided in this process of possible cultural amalgamation.

If we look at the importance of the extending of houses in creating multi-period houses-sites, altough documented in all areas, two regions take the lead. In West-Friesland, a tenth of the house-sites may have witnessed an extension of their defining house.[137] In the northern Netherlands, this figure reaches an astonishing 31% (table 7.2). I have already argued earlier that this region (and part of the eastern Netherlands?) can be characterized by compartmentalized house construction (section 5.2.3.3, esp. figs. 5.22; 5.23). This modularity has caused an overall high frequency of house-extensions and incidentally also some very long composite house plans (Kooi 2008, 62 figs. 3-4). By contrast, in the river area houses were very infrequently (*c.* 3-5 %) extended.

Some researchers have suggested that after relocation, Middle Bronze Age(-B) house(hold)s returned in a later phase to former house-sites.[138] The different implications of 'rebuilding' and 'overbuilding' (section 3.2.3; fig. 3.3) have presumably been overlooked, or in any case not systematically studied, in such claims.[139] Overbuilding was infrequent in the river area (*c.* 5 %), but occurred more common in West-Friesland (*c.* 12 %) and most frequently (*c.* 18 %) in the northern Netherlands. It remains dubious whether the situation in the northern Netherlands is representative for Middle Bronze Age-B settlement dynamics, as in many cases the overbuilding here concerns and/or involves Elp-type farmhouses (type B2; fig. 5.14), which have been argued to date to the two final centuries of the Middle Bronze Age-B and the Middle Bronze Age-Late Bronze Age transition (fig. 5.24).[140]

To sum up, from a comparison of house-site dynamics between several different regions, it is clear that distinct regions can be identified by the different causes that led to the multi-phased Middle Bronze Age-B house-sites there (table 7.2). The house-site dynamics of the river area can thus be characterized as a system of mostly single-phased house-sites, supplemented by multi-phased house-sites comprising mostly rebuilt houses. In the adjacent southern Netherlands area, rebuilding presumably was not as frequent, and single-phased house-sites are more common. For the ice-pushed hills directly to the north of the river area, too few data are available to allow reliable characterization. The Middle Bronze Age-B house-site dynamics in the eastern Netherlands may be similar to that of the southern Netherlands region, although here too the low number of documented cases affects the certainty of characterization. In the northern Netherlands, a pattern of house-site dynamics was current that is distinctly different from that of the river area. There, house-sites were more frequently multi-phased and both the extension of houses and the overbuilding of houses occurred with unparalleled frequency. The largest dominance of multi-phased house-sites is recorded for West-Friesland, as here both rebuilding and extending of houses occurred in significant numbers. From the (near-) coastal region, relatively few house-sites are known, yet these are all multi-phased.

Despite evident similarities between house-sites from the river area and West-Friesland, such as in house-types (table 5.6), the presence of house-site ditches (section 5.6) and common occurrence of rebuilding (table 7.2), some differences should also be noted. Overbuilding of houses and the extension of houses occurred more frequently in West-Friesland, and the overall percentage of multi-phased house-sites is higher there.[141] Consequently, the river area is best considered – like other areas – as a region with a system of house-site dynamics of its own.[142]

Towards new models?

In an earlier chapter, I discussed and criticized the current main model(s) for Bronze Age settlement dynamics (section 3.3; 3.3.4). I have argued that the validity of these models is decreased by the fact that several issues, such

137 The high value (25 %) for the ice-pushed hills is again dismissed because of the small sample size (n = 4; table 7.2).

138 *E.g.* Butler 1969, 66; Waterbolk 1987, 203; Roymans & Fokkens 1991, 12, *cf.* fig. 3.5.

139 Consequently, the 'special' position of West-Friesland as showing houses being rebuilt on the same house-sites, as forwarded by Roymans & Fokkens (1991, 12), consists of rebuilding (16 %), extending (10 %) and overbuilding (12 % ; table 7.2).

140 Compare this to figs. 5.12-5.13 or Bourgeois & Arnoldussen 2006, 21 fig. 6, where the majority of (predominantly indirect) dates for Middle Bronze Age-B houses from all areas clusters around 1500-1200 cal BC.

141 Additionally, it is possible that the use-life of Bronze Age settlement sites in West-Friesland was somewhat longer, as here various radiocarbon dates spanning the end of the Middle Bronze Age-B and into the Late Bronze Age are known (*e.g.* Van Regteren Altena, Van Mensch & IJzereef 1977, 250-251; Buurman 1996c, 112; Lanting & Van der Plicht 2003, 185-186; 205).

142 In particular, the occurrence of type W2 walls and elaborate entrance portals is documented for the river area, but absent in West-Friesland (table 5.6).

as causality (*e.g.* why did house-relocation occur?, are barrows always present near houses?), representativeness (to what percentage does this model apply?), periodisation (for which period is it valid?) and regionality (to what areas does it apply?) are rarely discussed explicitly. In this study, these issues have therefore received special attention.

The causality of periodical relocation of the house(-site) has been investigated in Chapter 3. It has been argued that wood-decay (section 3.4.2) and soil-depletion (section 3.4.4) need not have been prime motives in different geogenetic regions. Moreover, direct evidence suggests that the longevity of Bronze Age timber may be a factor two to three times higher than previously assumed. This complicates a direct correlation between human generational cycles and house-relocation. Additionally, I have shown that inorganic depositions in houses are not representative correlates for studying house-household interrelations (section 3.4.3). At this point, however, no other generally valid causes for domestic mobility can be brought to the fore that can be supported archeologically. House-site relocation may, for instance, still have been caused by limited life-span of the timber, but in such a scenario it is rather a multi-generation farmhouse that was abandoned after 50 to 100 years, rather than a house being abandoned after having been occupied by just one human generation. Alternatively, archeologically invisible causes such as sociological or ideological, or more pragmatic motives such as animal infestations or the decreased size of usable land in a fluvial setting may have been valid reasons for relocation. An element of key importance here, is that from an occupant's perspective, the mobility of houses will have been considered very low.[143] Rather, houses may have been perceived as being 'rebuilt', regardless of whether this occurred on the spot or at a more distant location. Undoubtedly, additionally houses were built that accompanied – or were 'branched-off' from – other co-existent houses and that may have been perceived as 'new' houses. These houses, however, conform in various aspects to regional and supra-regionally shared construction properties which were, evidently, not open to manipulation. This suggests that upon rebuilding Middle Bronze Age(-B) houses, communal or even ancestral values were stressed, rather than individual (household) values (*cf.* section 5.2.3.4).

Due to a lack of chronological resolution (section 5.2.3.1), the periodicity of Middle Bronze Age-B house-relocation – regardless of its motives – presently remains largely unknown. It is however clear that in the river area, more so than in the adjacent southern coversand region, agglomerations of house(-site)s evolved. While the indirect dates for such sites in the Dutch river area frequently allow for contemporaneity (*e.g.* section 4.2-4.3.4; Appendices I-II) this is not proven. However, the date ranges obtained, the typological similarities of houses within single Middle Bronze Age-B settlement sites (Chapter 4 and section 5.2.3.2), the observable correspondence in orientation (section 6.4.1) and the placement within wider systems of fences that shared this orientation (section 6.4.3) are all indirect arguments in support of contemporaneity (*cf.* fig. 7.9, B). Moreover, I have argued that in (suitable locations within) the river area, Middle Bronze Age-B house-sites are generally only between 20 to 80 m apart (section 6.5).

In various Middle Bronze Age-B settlement sites outside the river area, agglomerations of house(-site)s of comparable sizes and orientation are known.[144] In those cases, however, feature preservation did not allow for fence-lines to be preserved and direct dates are (again, through poorer preservation conditions) absent. To my mind (partial) contemporaneity of several of such house(-site)s should be seriously considered (*cf.* fig. 7.9, B). Future research at locations with adequate preservation conditions may in future confirm (or refute) the contemporaneity of small (yet presumably up to 4 or 5 (or more?) house-sites large) agglomerations of Middle Bronze Age-B house-sites in the various regions. Nonetheless, issues of representativeness should not be overlooked. There are several good examples of extensively excavated areas where only a single Middle Bronze Age house plan was uncovered.[145] Therefore, in some regions beyond the river area, settlement systems comprising (and combining?) isolated and conglomerate house-sites may have existed. The more detailed study of these regions, however lies beyond the scope of the present investigation.

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143 Moreover, some anthropological examples suggest that immobility and 'old age' may be important valued features of houses (and Houses); see Chapter 3, note 73.

144 *E.g.* at Andijk (IJzereef & Van Regteren Altena 1991), Angelslo (Van der Waals & Butler 1976; Kooi 2008) and Bovenkarspel (IJzereef & Van Regteren Altena 1991), Boxmeer (Hiddink 2000), Hijken (Harsema 1991), Hoogkarspel (Bakker *et al.* 1977) and possibly at Breda - Huifakker (Berkvens, Brandenburgh & Koot 2004), Borger (Kooi 1996; 2008), Colmschate (Verlinde 1991), Dalen (Kooi 1991), Noordbarge (Harsema 1997a) and Rhenen (Van Hoof & Meurkens 2007).

145 *E.g.* Oss - De Geer (fig. 5.10; Jansen & Van Hoof 2003), Breda - Moskes (Berkvens, Brandenburgh & Koot 2004, 55 fig. 4.1) or Den Dungen (Verwers 1991).

As I have shown in sections 3.3.3 and 3.3.4 that graphic models of Middle Bronze Age settlement dynamics are prone to implicitly communicate aspects whose relevance, causality and domain of applicability is not specified, I will refrain from offering an alternative graphic model here. But this does not mean that Middle Bronze Age-B settlement dynamics in the Dutch river area cannot be modeled approximately. Rather, it means that textual descriptions of these dynamics can be as accurate, while providing less room for misinterpretation. Lastly, it should be stressed that the causalities and temporalities of Middle Bronze Age settlement dynamics are still ill-understood and warrant further study. The section below can thus offer no more than a preliminary interpretation, which hopefully may inspire more specific research questions into the nature and dynamics of (Middle) Bronze Age(-B) settlements.

A tentative generic model for Middle Bronze Age-B occupation in the Dutch river area

During the Middle Bronze Age-B in the Dutch river area, house-sites were constructed on levee and crevasse-splay deposits where no excess flooding or sedimentation took place. These were frequently the levee- and/or crevasse-splay deposits of (long) inactive fluvial systems, but also crevasse splay deposits belonging to – or situated in the close vicinity (< 500 m) of – active fluvial systems. In the latter case, the crevasse inlet channel had presumably already silted-up, which means that only in incidental cases flooding or sedimentation from the residual crevasse gully occurred. These locations were selected for a combination of factors. The lobate sand-sheets of the crevasse splay deposits offered well-drained settlement areas that could often be exploited for habitation or crop-cultivation without having to remove prior shrub or alluvial woodland vegetation. By contrast, for the levees it may have been their alluvial forest vegetation (and the associated plants and animals) that appealed to Bronze Age occupants. Both crevasse splays and levee deposits were very fertile locations for crop-cultivation, and the transitional zones from these areas into the lowermost parts of the floodbasin – where some patches of open water may have been present – were equally excellent (potential) pastures. Presumably, these good physical conditions for habitation, crop-cultivation and livestock rearing, combined with the small distances in-between (because of the mosaic character of such landscapes) formed important 'pull factors' for Middle Bronze Age-B habitation.

In addition, the various clues the cultural landscapes offered of prior human activities, such as finds, visible changes in vegetation or visible structures such as larger pits, palisades or barrows, may have conveyed notions of ancestral success and approval that added to the draw of particular plots. The construction of houses and granaries may have involved a significant workforce, as five different axe tool-marks were found on the posts of a single granary (Knippenberg & Jongste 2005, 123). The fact that initial agriculture by new households may have been a risky business, but also that help in harvesting, exchange of breeding stock and other agricultural labour and help was needed, will have favoured habitation in locations not too distant from relatives or others that were able and willing to offer help. Once constructed, houses presumably stood for several generations, and were respected by other houses erected in the vicinity. Several such additional houses may very well have been contemporaneous, as they commonly are of comparable types and frequently conform in orientation. The houses in such agglomerations were generally placed at 20 to 80 m from each other.

The shared orientation of houses needs not to have been derived from the orientation of other houses *per se*. Around the houses, frequently extensive systems of land-parcelling were constructed with fences. While in some parts of the settlement site the trajectories of such fences may have been steered by the morphology (and/or related vegetation) of the subsoil, at most sites the fence-lines form extensive, moderately straight, bi-axial (perpendicular) lines across the land. Such fences could have acted as field- or livestock boundaries and almost never seem to have been constructed with the intent to surround individual house-sites. House-sites nonetheless are sometimes *de facto* bounded by such fence-lines.

Directly around the houses, within a zone of 10 to 40 m from the houses, a few granary-type outbuildings are commonly constructed and sometimes a barn/shed-type of outbuilding. When it was thought necessary to replace them, the outbuildings are frequently rebuilt on the near same spot, with the same ground plan and the same orientation. Pits are frequently found on Middle Bronze Age-B house-sites, but they were only rarely used as refuse dumps and seldom cluster in the vicinity of the houses. Therefore, pits seem to be part of distributions across settlement site space as a whole, rather than being related to house(-site)s proper. The location of wells presumably is also not related to that of house(-site)s, but to the availability of good usable aquifers, which explains why clusters of wells sometimes formed in such locations.

Based on the rebuilding of granary-type outbuildings it can be assumed that a certain, preset, house-site structuring was considered desirable to maintain over longer periods. The same argument applies to rebuilt houses. For up to a fifth of the house-sites, the main farm building was rebuilt. This was frequently done with such comparability in dimensioning, orientation and post-placement, that it may be assumed that the same local group (among which specific details of house construction were presumably shared) or household was responsible for the construction of both house-phases. While houses were normally rebuilt only once, cases of houses being rebuilt three times are known as well.

There are no indications (such as abandonment deposits) that houses may have been deliberately abandoned shortly (*e.g.* < 30 years) after construction of well prior to structural decay. Moreover, processes such as the rebuilding of house-site elements, adding extensions to houses and normal repairs executed, all convey an image of Bronze Age farmers that were 'there-to-stay'. Nonetheless, when locations were abandoned, posts were cut or snapped-off at surface level to be salvaged and re-used, although possibly some were left standing above-ground. Regardless what was done with old posts, the changed surface area of the former house-site in terms of vegetation and ubiquitous debris, indicates that such plots will have been visible for decades and could possibly be remembered even longer. At some sites, outbuildings – that still conformed in orientation to that of the former house and/or houses in the vicinity – may have been constructed on the location of former houses. Possibly, this was a deliberate (symbolic) act to create ties between (un)known former household members and the household that used the particular outbuilding.

Not all later uses of former house-sites may have been so deliberate. Frequently, outbuildings with different orientation overlap with former house ground plans. Their deviant orientation may indicate that sufficient time had lapsed for the former systems of orientation to have been lost or altered. Additionally, some house-sites were later used as fields, as indicated by the ard-marks that have been found cross-cutting house-site structures.

The reasons to abandon Middle Bronze Age-B settlement sites need not have been related to fluvial processes, but in some cases clearly were. At several settlement sites, new crevasse formation presumably brought areas previously unaffected under more intense fluvial influence. This could result in prolonged or more frequent flooding, or – in more rare cases – in the deposition of crevasse splay deposits on top of the house-sites. While a period of more frequent avulsion and crevasse splay formation is thought to have affected the delta as a whole at the Middle Bronze Age-Late Bronze Age transition, habitation could locally continue unproblematically into the Late Bronze Age.

7.4 The aftermath: Late Bronze Age and Early Iron Age occupation in the Dutch river area

7.4.1 Problems of periodisation

According to established views, during the 11th century cal BC, and somewhat earlier in the northern Netherlands (Gerritsen 2003, 121; Van den Broeke 2005a, 482) the first urnfields emerge (with the typical long-bed barrows) as the defining element of the Late Bronze Age (Van den Broeke, Fokkens & Van Gijn 2005, 31).[146] Traditionally, the introduction of *Urnenfelderkultur*-related pottery in the southern Netherlands and two-handled and biconical vessels in the northern Netherlands, were also defining traits (Anonymous 1967, 9; Lanting & Mook 1977, 7). As there are indications that such vessels may have already emerged prior to the 11th century, presently only the (typical grave forms in) urnfields are used as the starting point of the Late Bronze Age (Van den Broeke, Fokkens & Van Gijn 2005, *loc. cit.*).[147] The Gasteren long-bed barrows in the north presumably date between the (late) 14th and initial 10th

146 Lanting and Van der Plicht (2003, 152) argue that the Middle Bronze Age-B/Late Bronze Age transition should be placed at 1200 cal BC or 2950 BP. They do not explicitly state which dates for what specific cultural traits this is based upon. The discussed dates relating to the periodization (*op. cit.*, 132), all pertain to HaA2 complexes and no good end-dates for the Br.D. are offered. This complicates the evaluation of the suggested Late Bronze Age start at 1200 cal BC.

147 See Bourgeois *in prep.* who argues that in the northern Netherlands biconical pots with looped handles (the so called G*asteren* urns) date to between 1400-1200 cal BC (as suggested by radiocarbon dates of their cremations, *e.g.* those from Balloërveld - Tum. 6 (GrA-18967: 3070 ± 40 BP; Lanting & Van der Plicht 2003, 213), Gasteren (GrA-16282: 3005 ± 40 BP; Lanting & Van der Plicht 2003, 162), Annertol (GrA-19082: 3020 ± 50; *ibid.*, 213) and Borger (GrA-17602: 3045 ± 40 BP; *loc. cit.*)). See also Arnoldussen & Ball 2007 on the dating of Late Bronze Age pottery in the southern Netherlands, which seems to start to change in some aspects from that of the Middle Bronze Age-B around or in the 12th century.

century BC (*cf.* Verlinde 1987, 173-193),[148] and the Goirle/Riethoven long-bed barrows in the southern Netherlands (*cf.* Roymans & Kortlang 1999, 42-53) span the 12th to 9th centuries,[149] although some will have been constructed during the Early Iron Age as well (Tol 1999, 103; Kortlang 1999, 163). Some significant changes in ceramic- and funerary styles may have occurred well prior to the 11th or even 12th century cal BC, and this weakens their applicability as (singular) indicators for the start of the Late Bronze Age.

Therefore, the start of the Late Bronze Age cannot be unambiguously related to the introduction of a new set of material culture and customs. Rather, the time-frame bracketed by the traditional periodisation (1100-800 cal BC) can only serve as a crude chronological index against which various changes in material culture and human activities – that have different trajectories (*cf.* fig. 8.13) – may be plotted. An (less desirable) alternative would be to shift the start of the Late Bronze Age forward some centuries, but that implies the preference of one trait (*e.g.* funerary traditions) over several others (*e.g.* bronze- and ceramics typochronology, wherein nonetheless significant changes occur after the 11th century). Moreover, Van den Broeke (2005a, 479) states that 'according to the evidence currently available, no fundamental changes seem to have taken place in settlement patterns or the economy at the transition from the Middle Bronze Age to the Late Bronze Age.' (*cf.* Gerritsen 2003, 123). For a study of settlement dynamics, as much as for the occupants of 13th to 11th century BC settlements, no evident caesura need to have been present. Yet, I will argue below that, as far as settlement pattern is concerned, some fundamental changes may very well have occurred between 1100 and 800 cal BC.

7.4.2 Where have all the houses gone? Late Bronze Age settlement sites in the river area

After a phase during which – for the Dutch river area, or The Netherlands as a whole for that matter – relatively many settlement sites are known, a remarkable drop in the number of known settlement sites occurs for the 12th to 9th century BC, which is roughly the period of the Late Bronze Age.[150] While find-spots of finds datable to the Late Bronze Age are by no means scarce, they can rarely be interpreted as representing a Late Bronze Age settlement site. This is partly caused by the fact that some find-spots represent stray finds and that clear-cut Late Bronze Age settlement site elements are difficult to recognize in large-scale excavations. In this, the Late Bronze Age period finds a perfect parallel in the situation during the Early Bronze Age and Middle Bronze Age-A. For these periods as well, the majority of find-spots known concerns isolated finds or pits with finds mixed with materials from other periods. A more detailed study of the nature of the Late Bronze Age remains in the different macro-regions and the river area as a whole may shed light on the reasons behind the observed decrease of known settlement sites.

Late Bronze Age find-spots in the central river area

During the Late Bronze Age in the Zijderveld macro-region, the Zijderveld fluvial system's residual gully was reactivated (De Jong 1970-1971, 83; Van Zijverden 2003a) and new sedimentation took place on top of parts of the landscape previously occupied by Middle Bronze Age-B communities (Hulst 1967a, 7; Berendsen & Hoek 2005). This presumably rendered the area economically unattractive, although a single wooden stake that was radiocarbon dated to the Late Bronze Age, indicates that the area was not completely inaccessible (Knippenberg & Jongste 2005, 17; Appendix I).

A similar situation existed in the Eigenblok macro-region, where – presumably during the 12th century BC – the residual gully of the eponymous fluvial system was also reactivated by crevasse activity (Van Zijverden 2004a; Appendix II). Combined with subsidence and ongoing sedimentation (Jongste 2002b, 590) the suitability of the area previously used for habitation decreased beyond what was considered acceptable. As at Zijderveld, the usage of the (excavated) area seems to have changed, rather than that complete abandonment of the micro-region occurred. Hoof-imprints testify to use as pastures and the higher parts may have been converted into fields. Some burnt patches of

148 Kooi 1979, 131; Lanting & Mook 1977, 131; Lanting & Van der Plicht 2003, 214-215.
149 Lanting & Mook 1977, 137; Lanting & Van der Plicht 2003, 222-223. A single older date is known for the 'De Heibloem' barrow (GrA-19132: 2990 ± 45 BP; Lanting & Van der Plicht 2003, 222; Modderman & Louwe Kooijmans 1966).
150 Van den Broeke 2005a, 483; Jongste & Van Zijverden 2007, *cf.* Fokkens 2005d, 73 on a similar situation during the Late Bronze Age of West-Friesland.

unknown function may date to this period as well, while also for a handful of pottery fragments uncovered at the Eigenblok excavation, a Late Bronze Age date is forwarded (Jongste & Van Wijngaarden 2002; Appendix II).

In the De Bogen macro-region, several fluvial systems remained active during the Late Bronze Age (Van Zijverden 2002b, 67; 78; 2004b). Two larger fluvial systems (Erichem and Bommel; Appendix III) presumably recombined at the point of the De Bogen excavation, although the Meteren system south of this junction may have become inactive during the Late Bronze Age (Van Zijverden 2002c, 40; 2004b). The extensive crevasse splays that eroded and covered the previous Middle Bronze Age-B occupation traces, originated from one, or all of these three systems.[151] There is no accurate date for the start of this period of crevasse splay formation, so it may be that some of the features uncovered at the Late Neolithic to Middle Bronze Age-B level in fact dated to the Late Bronze Age. Presumably, the highest parts of the micro-topographic landscape were not even affected by sedimentation. For instance, one of the interments in the barrow at De Bogen site 45 (fig. 4.21, E) may very well date to the Late Bronze Age (Bourgeois & Fontijn 2008; Meijlink 2008). It remains remarkable nonetheless, that not a single clear-cut Late Bronze Age sherd was recognized during the various excavations (Appendix III). This could suggest that crevasse formation took place exactly during the (start of the?) Late Bronze Age. In any case, after a period of fluvial sedimentation, a more quiet period occurred as a vegetation horizon formed in the top of the new crevasse deposits and peat growth was dated to *c.* 1010-820 cal BC (Van Zijverden 2002b, 78-79; Appendix III). In some parts this vegetation horizon was preserved and showed cattle hoof-imprints (Van Zijverden 2002b, 68-69) and pottery classified as 'Bronze Age' (Appendix II, fig. III.36, no 995). As this layer stratigraphically overlies the Late Neolithic-Middle Bronze Age-B level, these sherds may represent the remains of a Late Bronze Age(-Early Iron Age?) settlement site, although the dating of the pottery is imprecise.[152] At this site as well, like at nearby Eigenblok, continued subsidence and sedimentation may have necessitated a change in landscape usage. To the former occupants, such a change may very well have been conceived more as a lateral shift, than as a categorical change: habitation sites may have shifted into use as fields, former fields may have been rendered into pastures and former pastures into areas of mud, peat or open water. None of these were new landscape types or uses for the occupants. It is their distribution that shifted, rather than change in landscape use in the strict sense.

Within the Wijk bij Duurstede macro-region, an avulsion of the Kromme Rijn from the Houten fluvial system took place around *c.* 1380-950 cal BC (Berendsen & Stouthamer 2001, 212; Van Zijverden 2004a). This led to the deposition of an up to 1 m thick sediment cover at the location of the previous Middle Bronze Age-B occupation at the site 'De Horden' (Steenbeek 1990, 67-70; 92; 188). Presumably, the absence of clear-cut Late Bronze Age finds from the Wijk bij Duurstede micro-region must be attributed to this prolonged period of sedimentation (Steenbeek 1990, 121-122).

At the Middle Bronze Age-B settlement site of Lienden as well, sedimentation covered (and partly eroded) the Middle Bronze Age-B settlement traces (Van Dinter 2002; Appendix V). New crevasse splays were most likely created by the Echteld fluvial system, whose sedimentation in the southern part of the Lienden macro-region starts around *c.* 1220-790 cal BC (Berendsen & Stouthamer 2001, 198; Van Dinter 2002, 50). While sedimentation and reactivation of the Westerveld fluvial system may have ended occupation on its levee- and crevasse deposits, the Lienden macro-region would not have been deserted completely. In the north, close to the still active Herveld fluvial system, some bronze objects and a flint sickle were found that may tentatively date to the Late Bronze Age (Willems 1981, 98; Hulst 1995). These finds were however not associated with traces that could be (indirectly) associated to a Late Bronze Age settlement site.

In the Dodewaard macro-region, two new fluvial systems may have become active at the end of the Late Bronze Age.[153] As no direct dates for their start of sedimentation are known, the date of *c.* 920-760 cal BC for the vegetation horizon that underlies floodbasin deposits attributed to these systems, provides a crude *terminus post quem* age (Steenbeek 1990, 233-237; Van Zijverden 2003b). This means that much, or in any case the higher parts of

151 See Van Zijverden 2002b, 64 fig. 3.2; Appendix III, fig. III.36.

152 Some pottery from the Middle Bronze Age-B/Late Bronze Age transition and start of the Late Bronze Age is of comparable fabric to that of the Middle Bronze Age-B (Arnoldussen & Ball 2007) which may explain the interpretation. A possible Late Bronze Age-Early Iron Age sherds was found at Geldermalsen - Middengebied (De Jager & Heunks 1998, fig. 7; Appendix III).

153 Wuustegraaf & Boelenham; Steenbeek 1990, 233; 237; Berendsen & Stouthamer 2001, 245-256.

the landscape accessible during the Middle Bronze Age-B, may have remained accessible up to the 9th century BC, although some water-level fluctuations in the floodbasin are documented.[154] Thus, it is no surprise that from three different locations in the Dodewaard micro-region, possible Late Bronze Age ceramics have been reported.[155]

In addition to the information obtained within the predefined macro-regions, the site of Tiel - Medel 8 has provided valuable information on the nature of Late Bronze Age settlement sites (Van Hoof & Jongste 2007). At this site, both Middle Bronze Age-B and Late Bronze Age settlement site elements have been recognized at the same stratigraphic level (*ibid.*). These remains are situated on levee or crevasse-splay deposits of the Zoelen fluvial system, which was presumably reactivated around the Middle Bronze Age-A (Van Zijverden 2007). During the Late Bronze Age, an active river system was found at 0.7 to 2.5 km to the south. An avulsion of the oldest phase of this system (known as the Bommel fluvial system) into the younger Echteld fluvial system took place around *c.* 1290-790 cal BC, *i.e.* during the Late Bronze Age (Berendsen & Stouthamer 2001, 198; Van Zijverden 2007). While the floodbasin to the south of the excavated site may have been flooded regularly during the Late Bronze Age, occupation – and economic exploitation – of the micro-region was evidently possible (fig. 7.15).

An important observation on the Late Bronze Age occupation traces at Tiel - Medel 8 is that they are deceptively similar to those of the preceding Middle Bronze Age-B occupation phase (Van Hoof & Jongste 2007). The recognized houses are mostly still three-aisled, and differ mainly by a less strict adherence to regularity in post-placement and a more confined length (*op. cit.*, 38-43). The granary-types of outbuildings are of comparable types and sizes, but appear no longer to be closely (conceptually and?) spatially associated with houses (*cf.* section 6.3.11). The remainder of the features dated by association to the Late Bronze Age, such as fences, pits, wells and stray postholes do not differ enough for them to be identified as Late Bronze Age in situations devoid of datable finds. This indicates that, from the perspective of settlement site analysis, Late Bronze Age settlement sites may be easily masked by, or misinterpreted as, settlement sites of different periods. Detailed (ceramic) typochronological studies and extensive radiocarbon dating may be the most readily available tools to facilitate correct dating.

Considering the fact that at Tiel - Medel 8 Late Bronze Age traces are ubiquitous and that no new fluvial systems emerge during the Early Iron Age, the absence of Early Iron Age traces at this site is in need of explanation. Presumably, the trajectory of the Echteld fluvial system closed-off (or at least significantly hampered) the westward drainage of the floodbasin to the south of the site. Therefore, reduced drainage may have led to stagnation and increased sedimentation in this floodbasin, as well as to a relative rise of the water-table. It is plausible that by the Early Iron Age, these processes combinedly rendered the exploitability of this area locally unsuitable.[156]

Intensified fluvial dynamics?

It is remarkable that the Late Bronze Age seems to have been a period of widespread increased fluvial dynamics. Within the Zijderveld, Eigenblok, Lienden and Wijk bij Duurstede macro-regions, crevasse splays were deposited on top of the areas occupied during the Middle Bronze Age-B, and in all but the latter case, an inactive residual gully was reactivated (*supra*). In the De Bogen macro-region a reorganization of the drainage structure occurred, which may have caused additional crevasse formation, but the highest parts of the micro-topographic landscape may have remained unaffected. At Tiel - Medel 8, and in the Dodewaard macro-region as well, only the lowermost parts of the micro-topographic landscape may have been affected, despite the emergence of new fluvial systems.

During the Late Bronze, an increase in the number of emerging fluvial systems in the central river area can be observed (Berendsen & Stouthamer 2001, 87-90 fig. 9.9, *cf.* Chapter 2, fig. 2.13, B). Possibly, increased bankfull discharge or increased within-channel sedimentation (as a result of decreasing gradients) or both combinedly were responsible for this increased avulsion rate (Stouthamer 2001, chapter 3). What exactly the trigger was for these processes remains unclear. A phase of climatic deterioration may have increased bankfull discharge, but this is

Fig. 7.15 (overleaf) Overview (A) and details (B, C) of the Late Bronze Age period structures at Tiel - Medel 8 (re-interpretation after Van Hoof & Jongste 2007).

a: not excavated, b: recent disturbances, c: presumed (filled features) and possible LBA structures, d: pits (light fill) and wells (dark fill), e: other features, f: find-spot of bronze socketed axe.

154 Steenbeek 1990, 175; 186; 194; Appendix VI, fig. VI.13.
155 Jongste 1997, 13-14; Peters 1999; 15; 19; Appendix VI, fig. VI.12.
156 Van Zijverden 2007, fig. 2.7; Van Zijverden, Jongste & Zuidhof *in press*.

thought to have occurred mainly after the Late Bronze Age.[157] Nonetheless, some recent studies have outlined the possibility of an increasingly wet climate near the end of the Middle Bronze Age-B and in the Late Bronze Age of north-west Europe.[158] Future research should target not only the exact chronology, but predominantly the local variations in, and severity of, claimed climatic deterioration (*cf.* Berglund 2003, 9).

157 Van Geel, Buurman & Waterbolk 1996a-b; Stouthamer 2001, 97; Van Geel *et al*. 2004, 1737. Note that the increase in numbers of Scythian sites, which is pivotal to Van Geel *et al*.'s argument is dated to 3000 BP (Van Geel *et al.* 2004, 1741; figs. 3-4), rather than as 'after 850 BC' and may be an artefact of research intensity or recognizability (Riehl & Pustovoytov 2006; *cf.* section 5.2.3.1 esp. fig. 5.12).

158 Dark 2006; Amesbury *et al.* 2008 and references therein, *cf.* Barber 1982, 110; Menotti 2002, 240 fig. 13.2; Berglund 2003; Tinner *et al.* 2003, esp. 1456.

Moreover, human factors may also have influenced river bankfull discharge. Increasing population densities and the woodland clearing associated with them in the upstream catchment areas of the Rhine and Meuse rivers may have increased bankfull discharge.[159] Deforestation reduces evaporation of rain and leads to increased surface runoff, the effect of which is most severe in the downstream delta (De Mulder *et al.* 2003, 231). Added to this increase in bankfull discharge (presumably by both climatic conditions and human interference), the drainage capacity of the Rhine-Meuse delta as a whole played a part. The number of coastal inlets through which the main rivers debouched decreased, which will have resulted in heightened groundwater tables, peat extensions and increased rates of floodbasin sedimentation (Stouthamer 2001, 187; Cohen 2003, 70-71; 97; De Mulder *et al.* 2003, 231). These factors all led to a quicker 'drowning' of marginal areas (*e.g.* areas prone to subsidence and sedimentation).

On the low numbers of known Late Bronze Age settlement sites in the river area

At this point, the difficulties in recognizing Late Bronze Age settlement sites in the river area may be summarized. First, the Late Bronze Age was a period of increased fluvial dynamics, which caused various avulsions and presumably intensified floodbasin sedimentation. Many former Middle Bronze Age-B settlement sites could be proven to have been affected by sedimentation during this period. In several cases, this sedimentation necessitated a change in landscape use and consequently a relocation of the domestic sites.

The options of where Late Bronze Age settlement sites could be located, may have been more limited than in the preceding period. Only few fluvial systems became inactive at the end of the Middle Bronze Age-B, which means that the number of relatively higher (*i.e.* less exposed to sedimentation) deposits was limited (fig. 2.13; Van Zijverden, Jongste & Zuidhoff *in prep.*). Nonetheless, excavations such as that of Tiel - Medel 8 show that locally, some parts of the formerly inhabited landscape could also be settled in the Late Bronze Age (fig. 7.15; Van Hoof & Jongste 2007).[160]

Additionally, research intensity and problems of preservation and recognizability may be important factors. The Late Bronze Age occupation is never targeted specifically, which means that most known finds concern stray objects or finds from small test-pits.[161] Preservation is also a problem, as finds-layers and vegetation horizons datable to this period are generally situated high enough to have been disturbed by modern ploughing (*e.g.* Van Zijverden 2002b, 69 fig. 2.5). Furthermore, I have argued that the nature of the settlement site elements and their association may have been less regular than in the Middle Bronze Age-B, which reduces recognizability. The post-configuration of houses was less regularly spaced (section 5.2.4) and no evident uniformity in orientation and placement of elements within (and between) house-sites can be outlined for this period (section 6.5, figs. 6.57-6.58). To put it otherwise: Late Bronze Age house-sites were not as strictly or visibly structured as those from the Middle Bronze Age-B and by the absence of corresponding orientation of houses and outbuildings, as well as by the larger number of outbuildings per house, they will be more difficult to identify on multi-period sites. Consequently, Late Bronze Age house- and settlement sites (or the houses on which these are centered) are difficult to identify outside the river area as well (section 5.2.4).

In any case, it should be stressed that no significant decrease in population should be assumed for the river area during the Late Bronze Age. The processes of avulsion (and crevasse- and floodbasin sedimentation) need to be evaluated at a local (*i.e.* micro-region) scale. Most likely, the intensified fluvial activity led to a fragmentation and/or contraction of habitation, rather than depopulation.[162] Moreover, as on most sites a (different) usage of the area can be outlined during the Late Bronze Age(-Early Iron Age) period, such relocation need not have involved movement at larger spatial scales (*e.g.* from the river area to the adjacent Pleistocene areas). Essentially, the "Late Bronze Age problem" (Van Zijverden & Jongste 2007; Koot *in prep.*) is more a problem of archaeological detectability than of *supra*-local prehistoric landscape crisis.

159 Richard 2000; Berendsen & Stouthamer 2001, 103; Berglund 2003, 9; Mäckel, Schneider & Seidel 2003, 495; Dark 2006, 1392; Jongste & Van Zijverden 2007.

160 *Cf.* Louwe Kooijmans 1974, 114; Deunhouwer 1986, 147.

161 Van Zijverden & Jongste 200; Van Zijverden, Jongste & Zuidhoff *in prep.*; Appendices I-VI, *cf.* Louwe Kooijmans 1974, 364, no 28; 366, no 49; 367, no 52; 372, no 93).

162 *Cf.* Louwe Kooijmans 1974, 114 on a phase of reforestation on the Schoonrewoerd stream ridge at Molenaarsgraaf prior to the Early Iron Age.

Nonetheless, It will be clear that the very few Late Bronze Age settlement sites presently known hamper a discussion of settlement site dynamics for this period. New research should focus on recording the distribution and differences in site types and their use-lives by means of excavations with detailed chronological control in areas of adequate preservation conditions. In any case, concepts of what 'proper' house-sites should look like in the Late Bronze Age, seem to have differed from the Middle Bronze Age-B and were open to more variation. Even the roof-bearing structure of the farmhouses, which was previously least open to manipulation, now shows significant differences at several scales (section 5.2.4). However, without more detailed studies, the similar appearance and site location of the Late Bronze Age to the Middle Bronze Age-B occupation period may prove deceptive, as no detailed information on chronology, subsistence strategies and landscape usage is presently available for Late Bronze Age settlement sites in the central river area or beyond.

7.4.3 The Early Iron Age: much continuity and some changes?

The Early Iron Age is a period which is difficult to characterize as being distinct from the preceding Late Bronze Age. For many fields of human behavior, the remains uncovered do not differ categorically, or do not differ at all from the preceding period. The subsistence strategy appears to be broadly comparable and a mixed-farming strategy comprising livestock herding (still predominantly cattle) and crop cultivation (yet now also with linseed, gold-of-pleasure and more frequently millet) was dominant (Brinkkemper & Van Wijngaarden-Bakker 2005, 494-501). The urnfield funerary tradition continued in a similar vein as well, regardless of the different types of urns and objects interred and variations in barrow forms (Gerritsen 2003, 126, *cf.* Waterbolk 1985, 41). The common use of iron for weaponry after the 8th century BC (*op. cit.*, 605; Fontijn 2003, 171-172) and innovations in material culture such new pottery types (Waterbolk 1985, 39; Van den Broeke 2005b) therefore form somewhat arbitrary handles for the start of a new period. While the types of houses change around the late 9th and 8th centuries BC to a type distinctly different to those of the preceding periods (fig. 5.31),[163] the types and associations of settlement site elements did not differ categorically from the preceding (Middle- and?) Late Bronze Age.[164]

As for the settlement dynamics, Early Iron Age settlement sites are rarely discussed in their own right. Rather, the settlement dynamics of this period are most frequently part of more long-term narratives spanning the Bronze- and Iron Age periods.[165] The most salient frequently outlined difference with Bronze Age occupation is the facts that for this period farmsteads (exclusively?) wandered and sometimes returned to previously used locations (Schinkel 2005, 524) and that the larger number of known urnfields suggest a demographic expansion (Gerritsen 2003, 200; 238-239; but see table 8.4). Additionally, it may have been during this period that the 'celtic field' systems took on their typical appearance with raised (and cultivated?) banks (Gerritsen 2003, 167-180; Spek *et al.* 2003, esp. 167). Gerritsen (2003, 173, 226-231) sees the dynamic and extensive use of plots within celtic fields and the soil-degradation in loam-poor sandy areas as important motives for the wandering of farmsteads during this period. But do such ideas also apply to the Dutch river area, where celtic fields are not found and soil-depletion need not have applied (section 3.4.4)?

Early Iron Age sites in the Dutch central river area

Several of the macro-regions saw habitation during the Early Iron Age. At Zijderveld, a single farmhouse and an outbuilding could be radiocarbon dated to the Early Iron Age, but presumably more features and structures such as fences may date to this period (Theunissen & Hulst 1999b; Appendix I, fig. I.21). The occupation took place on top of the deposits overlying the Middle Bronze Age remains (Hulst 1967a, 7) and the pottery suggests a 7th century BC return of habitation (Theunissen & Hulst 1999b, 174). At that time, no fluvial systems were active in the Zijderveld macro-region, but some flooding by the Buren system east of the macro-region may have occurred (Van Zijverden 2003a). The Early Iron Age house was situated on the highest parts of the excavated micro-topographic landscape and spade-marks at similar locations may suggest agricultural use (Hulst 1967a, 7; 18). There is also evidence to

163 Type Een/Kleuvenveld or Ussen-2 (section 5.2.5). These houses are generally shorter (< 20 m; fig. 5.32, A), have entrances opposed midway in the long sides and posts placed outside the walls that carried part of the roof-burden.
164 *Cf.* Schinkel 1998, 168 fig. 148; 177 fig. 157; Gerritsen 2003, 103 fig. 3.33.
165 *E.g.* Schinkel 1998, 167-179; 2005; Gerritsen 2003, 242-244.

suggest that similar higher locations on long fossil levee deposits (Arnoldussen & Van Zijverden 2004) as well as available aeolian dunes were possibly used for habitation.[166]

In the Eigenblok micro-region, floodbasin sedimentation as well as incidental crevasse splay formation occurred during the Early Iron Age (Van Zijverden 2002a; 2004a). One sample from a residual channel of such a crevasse was dated to *c.* 740-410 cal BC (Jongste 2002a, 36; Appendix II). Nonetheless, parts of several sites were accessible, as posts from sites 2 and 5 could be radiocarbon dated to the Early Iron Age (Jongste 2002a, 35). At Eigenblok site 2, a six-post structure was erected at the transition to a more peaty and lower lying part of the floodbasin, where also an area was burnt and a large pit with some Early Iron Age ceramics was uncovered.[167] These remains, and several others from the Eigenblok macro-region, suggest a human presence although no clear-cut settlement sites can at present be outlined (Appendix II, fig. II.18). Presumably, such sites may be situated just outside the excavated areas (*ibid*.).

Sedimentation and crevasse splay formation may also have continued in the De Bogen macro-region during the Early Iron Age (Van Zijverden 2002c, 40), which may explain why no Early Iron Age finds are known from the various De Bogen excavations. A similar situation may have existed in the Lienden and Dodewaard macro-regions. In the Lienden macro-region, continued sedimentation and reactivation of the Westerveld residual gully was caused by the active Echteld system (Van Dinter 2002, 48). In the Dodewaard macro-region, combined sedimentation by the Herveld, Wuustegraaf and Boelenham fluvial systems covered the previously accessible areas.[168] Nonetheless, fluvial activity need not imply human absence in all parts of the macro-region. For example, the various find-spots in the wider De Bogen macro-region indicate that fluvial systems which had become inactive relatively recently, supported Early Iron Age activities in various parts.[169] However, within the excavated parts of the De Bogen, Lienden and Dodewaard macro-regions, the areas of limited or absent fluvial sedimentation were presumably too small or too discontinuous to be profitably used for agriculture and habitation during the Early Iron Age.[170]

In stark contrast, the Wijk bij Duurstede - De Horden excavations have yielded traces of presumable Early Iron Age habitation and funerary use on top of the former Middle Bronze Age-B settlement site area (fig. 5.16; Hessing 1989; Appendix IV). The urnfield ditches (deliberately?) overlapped with the location of the possible Bronze Age barrow (fig. 7.16, A, *cf.* fig. 4.28). The Iron Age features were dug into a vegetation horizon that had formed in the top of the (thick) crevasse splay deposits (Steenbeek 1990, 70; 118; 132). Throughout the Early Iron Age, the nearby (< 500 m) Kromme Rijn system remained active but apparently did not render occupation impossible.[171]

To sum it up, the evidence from the different macro-regions indicates that a diverse spectrum of locations was used during the Early Iron Age. Both long fossil levees (*e.g.* Culemborg - De Heuvel; Arnoldussen & Van Zijverden 2004) and relatively young crevasse splay deposits (overlying older deposits, *e.g.* at Wijk bij Duurstede and Zijderveld) were suitable settlement site locations. If local conditions were characterized by low fluvial dynamics (*i.e.* none to normal (floodbasin) sedimentation) occupation could take place at close distance to active fluvial systems (*e.g.* at Wijk bij Duurstede). In other areas, where more dynamic conditions prevailed (*e.g.* at Lienden and Dodewaard), circumstances may have been perceived as unfavorable to Early Iron Age habitation. Nonetheless, in such locations, as well as in locations where only small areas may have been left unaffected by sedimentation (*e.g.* Eigenblok), other types of landscape use than habitation may still have taken place. The available data suggest a flexible, maximizing and tailored strategy of landscape use that is perhaps akin to that of the Middle Bronze Age-B (section 7.3).

166 De Kok 1965, 122; Louwe Kooijmans 1974, 115; 370-371). Since this pottery was not dated more precisely than 'Iron Age', an Early Iron Age date must remain tentative.

167 Remarkably, a post datable to the Middle Bronze Age-B was also recovered from this pit (Hielkema, Prangsma & Jongste 2002, 106-108; Appendix II, fig. II.19, d).

168 Steenbeek 1990, 180-188; 194; Van Zijverden 2003b.

169 De Jager 1996, 11-13; Hulst 1994, 72; Appendix III, fig. III.37.

170 From both the De Bogen (Hielkema, Brokke & Meijlink 2002, 160; 185-187; 210-211; 225; Milojkovic & Smits 2002; Gehasse & Leijnse 2002) as well as from the Lienden macro-region (Siemons 2001, 82-90; Wiepking 2001, 143; 148) indications of Middle Iron Age activities are known.

171 Berendsen & Stouthamer 2001, 212; Hessing & Steenbeek 1990; Appendix IV.

Fig. 7.16 Overview (A)of the (Early) Iron Age habitation and urnfield at Wijk bij Duurstede - De Horden in relation to prior MBA-B occupation traces and two details (B-C).

a: not excavated, b: distribution of Early Iron Age structures, c: distribution of Middle Bronze Age-B structures, d: extent of Early Iron Age urnfield, e: Early Iron Age ditch system, f: Early Iron Age structures.

7.5 Settlement site dynamics and dynamics landscapes: a summary

In this chapter, different types of dynamics affecting Bronze Age occupation have been discussed from a long-term perspective. I have argued that differences in settlement dynamics must be evaluated against the differences and different dynamics of various geogenetic regions (horizontal plane) as well as against the (chronologies of) cultural processes of change (vertical plane). Essentially, for particular periods, answers to questions like 'how were which parts of the landscape used differently within the respective settlement system?' can only be properly understood in relation to landscape use and settlement dynamics of preceding and ensuing periods. Therefore, this chapter has started with a discussion of (models for) Neolithic settlement dynamics.

For the Middle Neolithic period, only limited information is available. I have suggested that a lack of targeted research into the Middle Neolithic usage of fluvial systems may be at the heart of this. In addition, the relatively deeper position of such fluvial systems indicates that they have been both more prone to later fluvial erosion, and also that the detectability of finds and finds-layers from this period is poorer compared to later periods. Nonetheless, there are indications that the levee and crevasse deposits of active fluvial systems were used, yet probable settlement sites can at present only be indicated on long fossil levees and on the aeolian river dunes (fig. 7.10).

During the Late Neolithic period, a wider range of landscapes (of different fluvial dynamics) can be proven to have been used. The diversity and numbers of remains recovered from crevasse splay deposits belong to, or located in the direct vicinity of, active fluvial systems suggests that such locations were intensively used, possibly as settlement sites. Presumably, such activities also took place on crevasse splay deposits whose inlet-channels were blocked relatively soon after initial formation, as well as on stacked crevasse splays that were less prone to subsidence. The fact that houses cannot easily be identified for this period, complicates the interpretation of these sites as settlement sites. In addition, several of the sites discussed in this study have also seen later (continuous?) use, which complicates the study of settlement site(dynamic)s in isolation. Consequently, even *if* indicators of settlement use duration (*e.g.* zoological seasonality indicators) are discovered, their applicability is frequently low.

As to the different types of sites, I have argued that preconceived notions of 'what Neolithic habitation should be like' may have overly steered interpretative frameworks for pre-Middle Bronze Age-B settlement site remains (figs. 7.2; 7.6). The importance of hunting as a subsistence strategy may have decreased significantly after the Middle Neolithic, and the examples for logistic site types such as fishing camps all originate from outside the river area. Nevertheless, the interpretation 'special activity site' has been assigned to several pre-Middle Bronze Age-B find-spots that were either (1) confined in spatial size or (2) thought (otherwise) to have been used only briefly. Unfortunately, some of these sites have not seen more extensive excavation, and others proved hard to distinguish from 'normal' settlement sites. Despite the weak evidence, I have suggested (fig. 7.6) that such additional (*e.g.* logistic-, extraction-) sites may very well have existed for Neolithic and Bronze Age periods alike. Their presence is by no means doubted, but it is their exact nature (*e.g.* qualitative and quantitative importance, duration of use(s)) that still needs to be investigated. At present, information on such sites within, and even outside, the central river area is limited and would benefit from targeted research. Only if based on factual observations, can the role of such sites in the settlement dynamics for different periods be veritably assessed.

During the Early Bronze Age the types of locations used and the nature of this usage does not seem to have changed fundamentally from the Late Neolithic. The recognition of individual settlement site elements remains as problematic as before, and the diagnostic pottery is rarely found in contexts that allow features or structures to be dated to the Early Bronze Age with certainty. Nonetheless, the diversity and quantities of remains uncovered at Molenaarsgraaf and De Bogen suggests that settlement sites were in any case situated on long fossil levee- and crevasse splay deposits. The frequent presence of Early Bronze Age remains in areas of different fluvial dynamics (especially crevasse splay deposits near, or next to active systems) need not have differed in nature, but this has not been investigated extensively enough to be certain. A paradoxical situation exists in that diagnostic pottery is easily recognized (leading to large numbers of sites known in various types of landscapes), while the nature of the occupation and settlement dynamics at large are essentially unknown for this period (and the two neighboring periods as well).

The scarcity of known (possible) settlement sites (and knowledge on their dynamics) only increases during Middle Bronze Age-A. For this period, only a single tentative settlement site location can be outlined (fig. 7.10). This is all the more remarkable as (continued) usage of several sites is suggested by radiocarbon dates. Two factors may be at play here. First, the nature of the Middle Bronze Age-A settlement site elements must be discussed. It is clear that Middle Bronze Age-A settlement site elements share properties with preceding periods (*e.g.* irregularly in plan) that render them archaeologically invisible, especially on palimpsest sites. Consequently, settlement site elements cannot easily be outlined for this period. Second, at locations more distant from the near-coastal areas (*cf.* sections 5.2.2 and 7.2.4.1) the quantitative presence of diagnostic pottery is very low. Only very few fragments decorated in the typical Hilversum-style (table 5.1) are found at the various settlement sites. Possibly, the central river area was a periphery to a coastal centre of gravity and the tradition of decorating pots in this fashion (or even the pots themselves?) percolated slowly and never dominantly into other areas. The point I want to make here does essentially not concern

the distribution of the typical pottery, but rather that this must have been a period of low-diagnostic pottery in most regions of the Netherlands. Much of what is considered Middle Bronze Age-B or generic 'Bronze Age pottery' may thus in theory date to this period. Evidently, only detailed research involving refined absolute dating strategies can shed light on the nature and dynamics of Middle Bronze Age-A sites in the river area and beyond.

With the start of the Middle Bronze Age-B, settlement sites can be outlined in various landscapes of different fluvial dynamics in the Dutch river area (fig. 7.10). This is predominantly a consequence of better recognizability of the settlement site elements (Chapter 5), but more intensive and targeted research (sections 1.6-1.7), as well as better preservation conditions (furthermore increasing detectability; section 2.7.4) are important factors as well. The ubiquitous presence of settlement sites in a variety of fluvial landscapes suggests an adaptive and maximizing strategy of land use. To put it otherwise: most available areas which could sustain occupation, appear to have been settled.

These settlements comprised possibly several contemporaneous houses, which were spaced evenly within a system of land-division set up by fences. At the settlement level, a shared system of (bi-axial, perpendicular) orientation to which the houses, fences and outbuildings conformed can frequently be outlined. Presumably, at some sites the orientation of this system may have been inspired by features of the micro-topographic landscape, such as topographic gradients or the orientation of residual gullies.

At the level of the house-site, several elements reflect an attitude to prolong occupation on particular spots. Structural properties such as the post-configuration, dimensioning and orientation were generally retained when houses or outbuildings were rebuilt (sections 6.4-6.5). In some cases, houses were even rebuilt more than once (fig. 7.7). Moreover, detailed campaigns of radiocarbon dating suggest that occupation of individual Middle Bronze Age-B house-sites may well have spanned five decades (section 3.4.2). Once constructed, houses are rarely overbuilt by other houses also dated to the Middle Bronze Age-B, which suggests – yet does not prove – contemporaneity of multiple houses and the fact that the singular domestic use of plots was respected in the long-term. Consequently, the fact that at most house-sites still only one house-phase is present, need not indicate the frequent wandering of farmsteads. Rather, their typological similarities, shared (biaxial) orientation and close proximity suggest that agglomerations of houses (*i.e.* hamlets or small villages) may have existed. The house-sites were part of a single system of land-parcelling and land-use communicated spatially by the fences. Such systems seem to extend for over hundreds of meters (yet presumably not several kilometers), and physically integrated plots usable for habitation, crop-cultivation or as pastures into settlement site space (*cf.* fig. 7.9, B; section 8.2.1). The detailed dynamics of domestic mobility (particularly periodicities) of and within such possible agglomerations of house-sites, need to be studied in more detail with extensive dating strategies. In addition, I have argued that there is significant regional variation in the ways in which multi-period house-sites developed between the different geogentic regions of The Netherlands (table 7.2). Finally, the nature, usage(s) and importance of logistic sites in general, but for this period in particular, is in need of more detailed study.

During the Late Bronze Age, a period of increased fluvial dynamics affected the delta as a whole. Avulsions were common and widespread and sedimentation by new systems, new crevasse formation and residual gully re-activation occurred at the locations of former Middle Bronze Age-B habitation in most of the macro-regions (Stouthamer 2001, 88 fig. 3.7; Appendices I-VI). Excessive and/or prolonged sedimentation in the already compartmentalized, mosaic, micro-topographic landscapes (*cf.* fig. 7.12) may have rendered the agricultural exploitation of these landscapes unacceptably difficult or even impossible. Some areas may have been completely abandoned, whereas others witnessed a change – or more precisely; a shift – of landscape use. It is important to stress that the local impact of *supra*-local effects such as the increased number of avulsions, will have differed significantly between the macro- and micro-scales. For example, the presence or absence of older deposits, whether they are more or less prone to subsidence, or the size and drainage possibilities of the floodbasin areas next to occupied areas, all affect the degree and timing of landscape changes. The fact that at Tiel - Medel 8, occupation took place both in the Middle Bronze Age-B and the Late Bronze Age (fig. 7.15) will hopefully be proven by future research not to have been a unique case. Nonetheless, it should be stressed again that only few fluvial systems cease their activity prior to the Late Bronze Age, compared to during the previous period (fig. 2.13). This means that the spatial distribution of Late Bronze Age remains may be more confined than those of the Middle Bronze Age-B. Whether this also corresponds to a demographic change, remains to be seen (*cf.* section 8.3.2). The less rigid landscape structuring, the

less strict associations between houses and outbuildings, the increased diversification in house plan structure and poorer preservation conditions all affect the recognizability of settlements from this period. The much smaller range of landscape types that appears to have been used (fig. 7.10), may be an under-representation.

Within the river area, the Early Iron Age occupation appears unrelated to that of the preceding Bronze Age in several aspects. First, a new type of house emerged that may have been perceived as a radical break from the tradition of building relatively long houses (with short-side entrances). Second, sedimentation on top of the Bronze Age occupation traces is likely to have completely (Wijk bij Duurstede) or partly (Eigenblok, Zijderveld) masked and/or destroyed the pre-existing landscape parcelling structures and settlement site elements. To put it more simply; the slate had been wiped clean. This implies that a new settlement site structuring, with new house-types and other axes of orientation could develop. At sites where no full covering or destruction by pre-Early Iron Age sedimentation took place, the remains from older periods may have remained partly visible. This may have caused a crude correspondence in orientation of the parcelling systems and/or houses (*e.g.* at Zijderveld), or the re-use of older materials (*e.g.* at Eigenblok). In addition to the occupation of such 'fresh' landscapes, the excavations at Culemborg - Den Heuvel have shown that the highest parts of some already centuries old fossil fluvial landscapes could still be used for habitation (Arnoldussen & Van Zijverden 2004).

In short, the long-term overview of settlement dynamics offered in this chapter has shown that the evidence available for analyses of the interplay of cultural-, landscape- and settlement dynamics in the Dutch river area is still rather limited for several periods. While for the Middle Neolithic a limited research intensity is the most influential factor, the low recognizability of houses severely affects studies of Late Neolithic to Middle Bronze Age-A settlements. Only for the Middle Bronze Age-B is the data set of sufficient size and quality to start to address more specific problems of settlement dynamics. I have shown that several arguments argue against the exclusive validity of the 'wandering farmstead'-interpretation of Bronze Age settlement dynamics in the river area. At the end of the Middle Bronze Age-B and the transition to the Late Bronze Age, a combination of increased cultural- (*i.e.* changes in the nature of settlement sites) and fluvial dynamics (*i.e.* increased discharge and avulsion rate) decreases the detectability of settlement sites in the river area. During the Early Iron Age, increased fluvial stability facilitated habitation and settlement sites are known in somewhat larger numbers again. Unfortunately, for nearly all periods, the lack of chronological resolution and seasonal indicators assigned to individual use-phases, hamper a discussion of the duration and permanency of use of different types of sites. In short, much work still needs to be done.