Food production and food procurement in the Bronze Age and Early Iron Age (2000-500 BC)

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2 The archaeology of the Bronze Age and Iron Age society

2.1 Introduction

The archaeology of the metal ages in north-western Europe has known a long tradition of research on various themes, like the development of settlements and settlement dynamics, burial customs, subsistence economy, ritual depositions, distribution systems, landscape and ideology. Over the course of time, numerous specialist studies in archaeology have focussed their attention on these aspects.

Special attention will be paid to the archaeology of North-Brabant (MDS region) on one hand and of the Moselle region on the other, as the botanical material for this study derives from these two areas. The chronology that is used for the two regions is presented in the following scheme (figure 2.1).

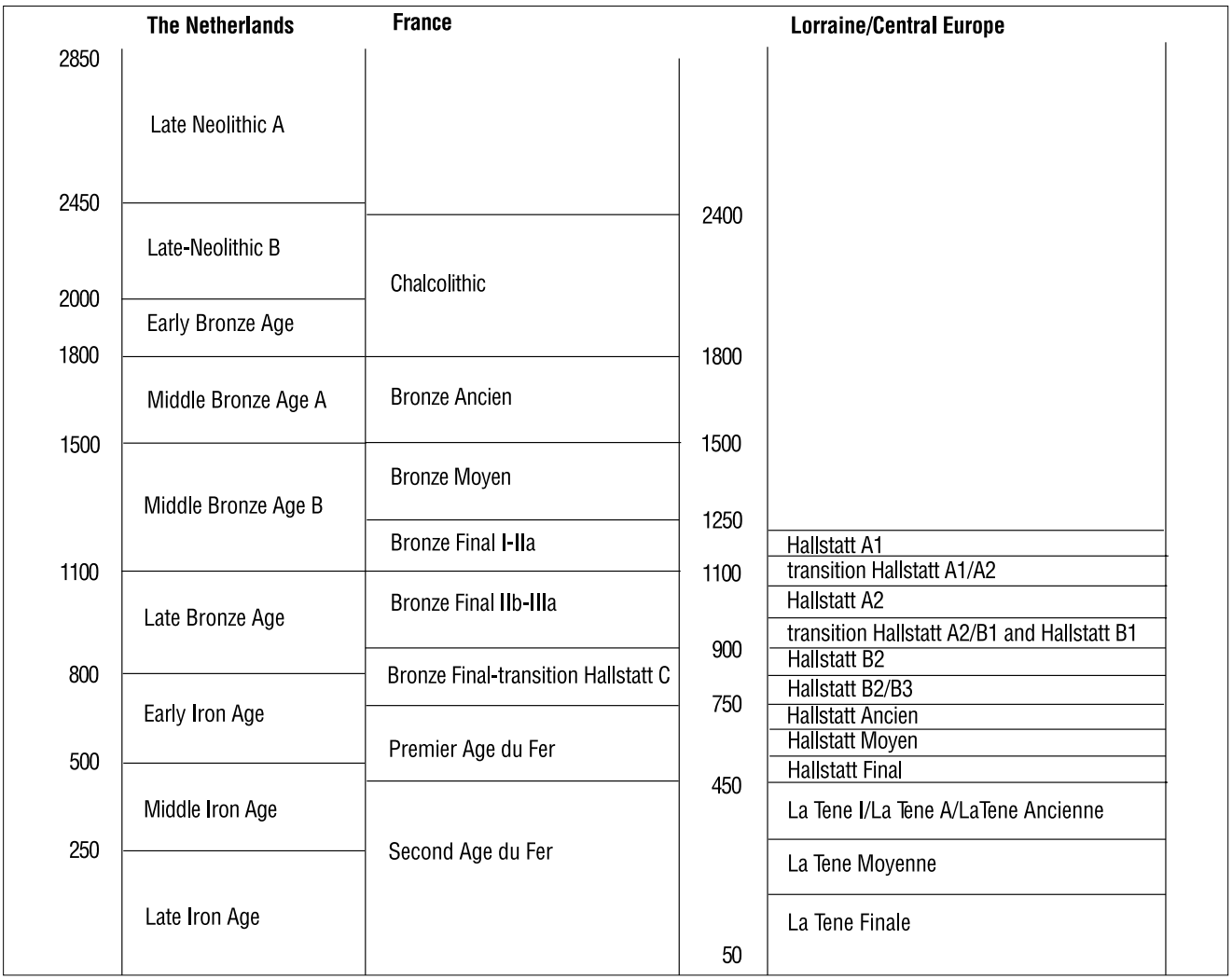


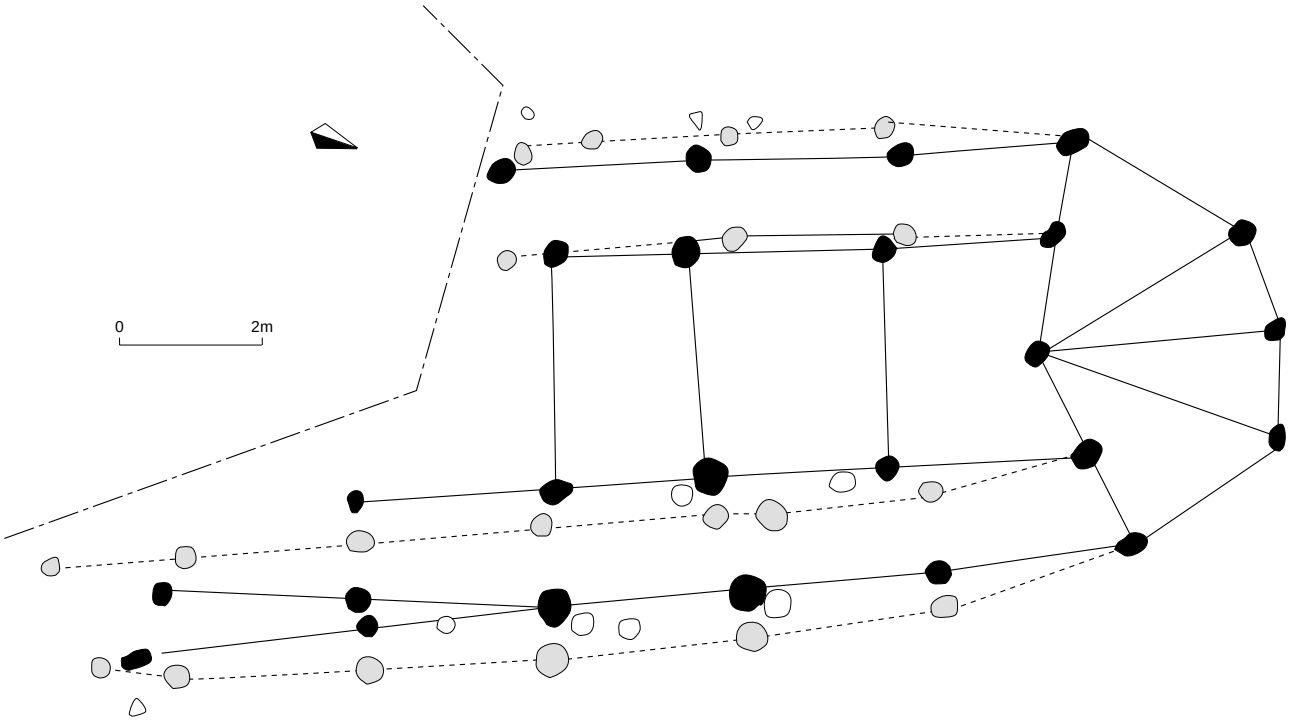
Fig. 2.1 Chronology of the later prehistory in the Netherlands and France

For the purpose of the present study two different archaeological spheres principally form the context. The first is the archaeological settlement research, working on the organisation and dynamics of agrarian settlements. It is evident that the way people organise their settlements is strongly related to their agricultural regime. Changes in settlement systems are therefore often used to detect contemporaneous changes in the agricultural regimes and agrarian land use of the inhabitants of these settlements.
The second sphere is the study of burial customs in Bronze Age and Iron Age society. The various ways people were buried are often interpreted in terms of the way prehistoric communities, through their ancestors, structured their environment and laid claims on ancestral land. Burial customs underwent some major changes during the Bronze Age and Iron Age. These changes in the mortuary ritual could be interpreted as an expression of the way society copes with various social issues like demographical expansion and pressure on (agricultural) land (see Roymans/Kortlang 1999).
In the following section the archaeological evidence on settlements and burials is presented in short (section 2.2). I will pay attention to those aspects that are related to changes in agriculture, like settlements dynamics, the organisation of farmyards, the introduction of the longhouse (barn house) in Atlantic Europe and the transition from barrows to urnfields. After this short presentation of settlement and burials, in section 2.3 the present state of the study of agricultural economy and arable field systems in Bronze Age and Early Iron Age archaeology is briefly presented.
In the next two sections I will focus on the changes in the agricultural regime and agricultural land use. In section 2.4 several different points of view are introduced on the dynamics of settlements in relation to developments in the agricultural regime. In section 2.5 some ideas on the developments in the claims on agricultural land are presented.
The various points of view on this diversity of subjects were developed by various authors in the past decade(s) and have had a strong influence on ideas and on the debate in the archaeology of the metal ages. My presentation in this chapter concentrates mainly on the French and Dutch debates by showing where possible differences of opinion still exist in which fields and where our knowledge runs short.

2.2 Bronze Age and Early Iron Age settlement organisation and burial customs

Large-scale settlement investigations in the study region during the past decades have greatly enlarged our knowledge of the organisation and dynamics of settlements in later prehistory. Archaeological excavations in the Netherlands, Belgium, Luxemburg and Lorraine (northern France) produce pictures that are to a large extent comparable. The MDS region and the Moselle region are both part of the same *Hauslandschaft* that stretches out from Denmark to France (Harsema 1996; see figure 1.2 above). At first glance, the changes in the organisation and structure of settlements through time, from the Late Neolithic through the Bronze Age to the Iron Age, were limited. Major changes in this realm did not occur before the later periods of the Middle and Late Iron Age and the Roman period.

The organisation and dynamics of settlements
In the Low Countries, the settlements that we know from the Late Neolithic and Early Bronze Age lay isolated and dispersed in the landscape. They consisted of one or sometimes two farmsteads. Several authors have described how, after a habitation phase of a single generation, the Bronze Age settlements were left and new ones were built on a different location. It is demonstrated that new farms were seldom built on the same yard: the settlements were, so to speak, wandering or shifting through the landscape (Roymans/Fokkens 1991; Schinkel 1998; Theunissen 1999). Several explanations have been put forward for the phenomenon of these shifting settlements. According to the traditional explanatory model the farmhouses could not last for more than c. 25 years; after this period the posts would be rotten. This does however not explain why the settlements would shift over such long distances. Another explanation is that the soils of the arable fields used by the inhabitants of the settlements would be exhausted after one generation. Recently, the cultural biography of the settlement is used as an explanatory model for the shifting of settlements (Gerritsen 1999). In this explanation, a relatively ephemeral habitation phase of one generation is only one stage within the long-term biography of a farmhouse, preceded by the construction phase and followed by abandonment and a stage of secondary use. Socio-cultural considerations would account for the abandonment of a settlement after one generation.
In publications by archaeologists of the Lorraine region, similar considerations with regard to the developments of settlement systems are to be found (Blouet et al. 1992, Blouet et al. 1996). The distribution and dynamics of settlements through the Bronze Age and Hallstatt landscape in this region is very comparable to those in the Netherlands. With a virtually cyclical regularity of one generation, people left their isolated, dispersed settlements to build a new house on another location.
We should make some side notes to put the phenomenon of the shifting of settlements in perspective. There are several known examples of Early and Middle Bronze Age houses in Lorraine and the Netherlands with indications of refection, restoration or enlargement phases (see figure 2.2). This suggests that a longer continuity of habitation of possibly more generations in the same settlement location sometimes took place.



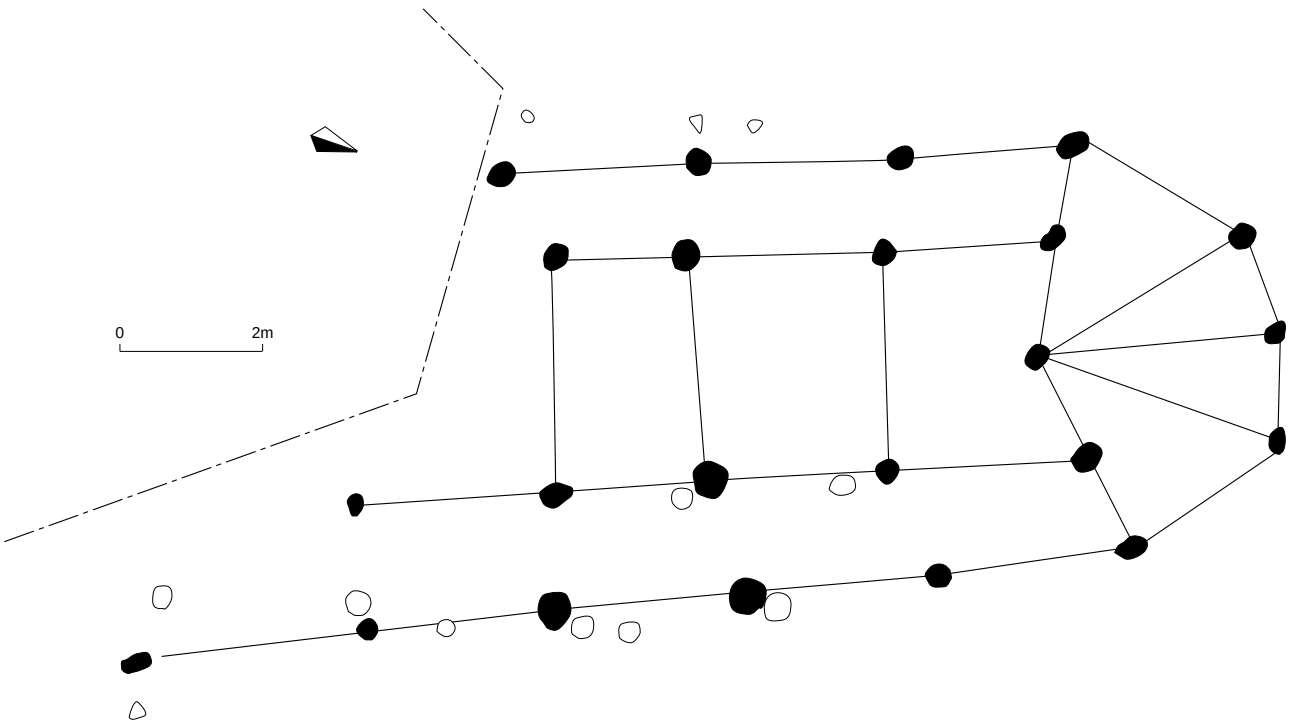


Fig. 2.2 Frouard "Le Saule Gaillard". Two-phased Bronze Age house V with restoration phase: house plan and reconstruction (see next page) (drawing by Henk de Lorm)

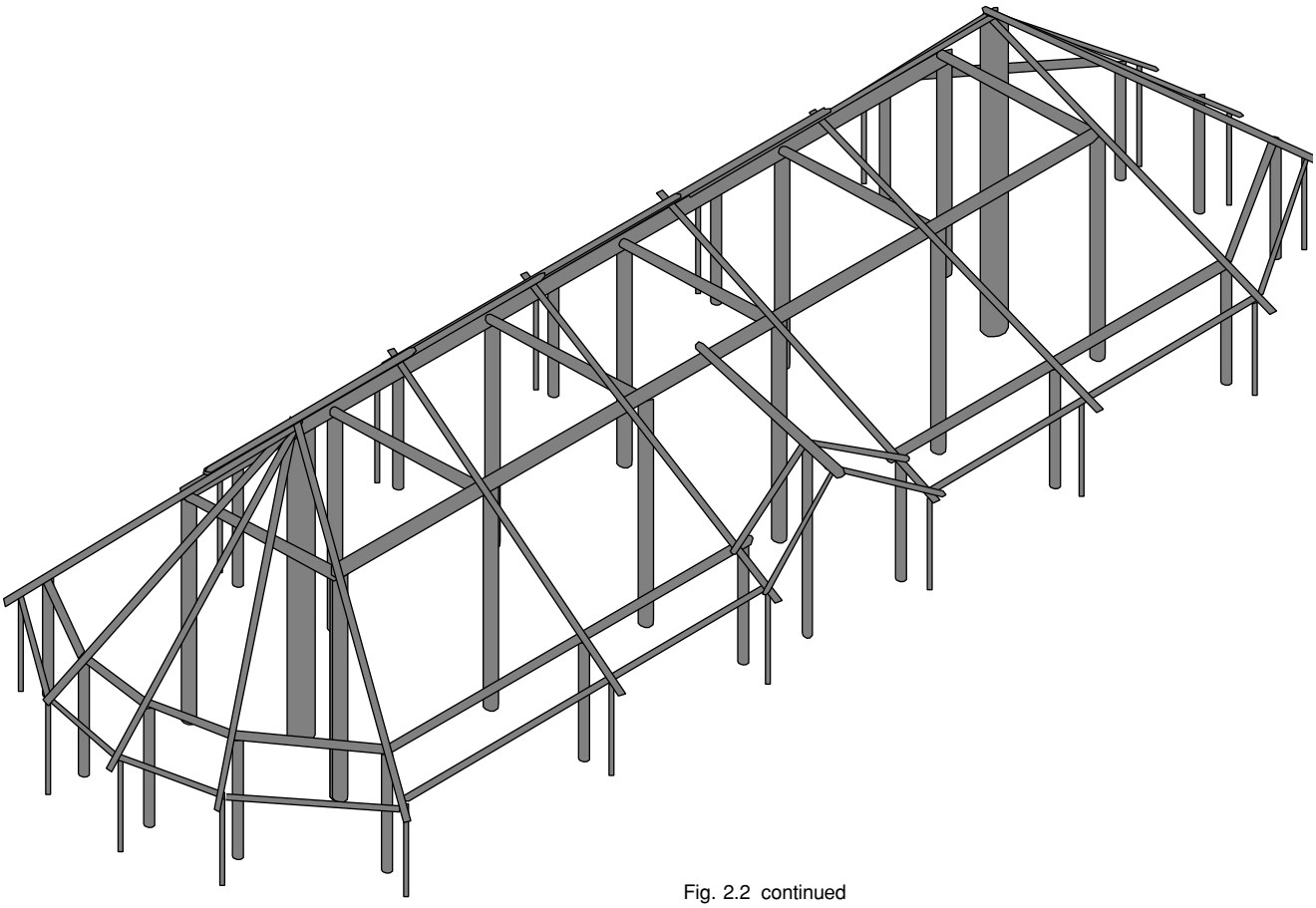


Fig. 2.2 continued

In the Late Bronze Age and Early Iron Age few changes occurred with regard to the organisation and dynamics of settlements. Only from the Middle or Late Iron Age onwards did the nature of settlements undergo some more essential transformations. In this period, habitation phases lasted more than only one generation and from the Late Iron Age onwards we regularly find settlements that consist of more than one contemporaneously occupied house (Schinkel 1998). Also in the Moselle area, conglomerations of houses occurred only from the Middle Iron Age onwards. However, small isolated settlements also remained in existence (Blouet et al. 1992, 186).

The presence of enclosures, like ditches, around settlements of the Late Iron Age is seen as a development related to radical social changes. However, in our regions, there are numerous earlier examples of settlements that were somehow enclosed or demarcated from the outside world. E.g. fenced Bronze Age settlements in Oss (Schinkel 1998) and the Dutch riverine area (Theunissen 1999) and various examples of enclosed settlements recovered in the region of Lorraine from the Early Bronze Age onwards. Clearly, these earlier forms of fenced settlements are not as powerful as the later ditched settlements in terms of expressiveness and permanency.

In the overall study region the picture exists of a dispersed population of a low density. From Lorraine, relatively small numbers of habitations are known from the period until c. 1250 BC. For the Chalcolithic (2400-1800 BC) and the Early Bronze Age a dozen or so sites are known at this moment. The Middle Bronze Age (1500-1250 BC) is represented by c. 20 sites (Blouet et al. 1992). According to some, the relatively low number of sites can be related to the low population density in this period. The examples that are known, however, demonstrate that the building constructions applied were much lighter than in later periods (Klag/Dolota 1998, 318-19). It is thus very well possible that these structures, especially the buildings, left features that are far less clearly visible when excavated. The majority of the Early and Middle Bronze Age settlements are situated on the Lorraine plateaux between the rivers Meurthe and Moselle. South of Pont-à-Mousson, some examples of habitation are known from the river valleys; there is a chance however that flooding destroyed a number of former sites in the valleys. For the Late Bronze Age

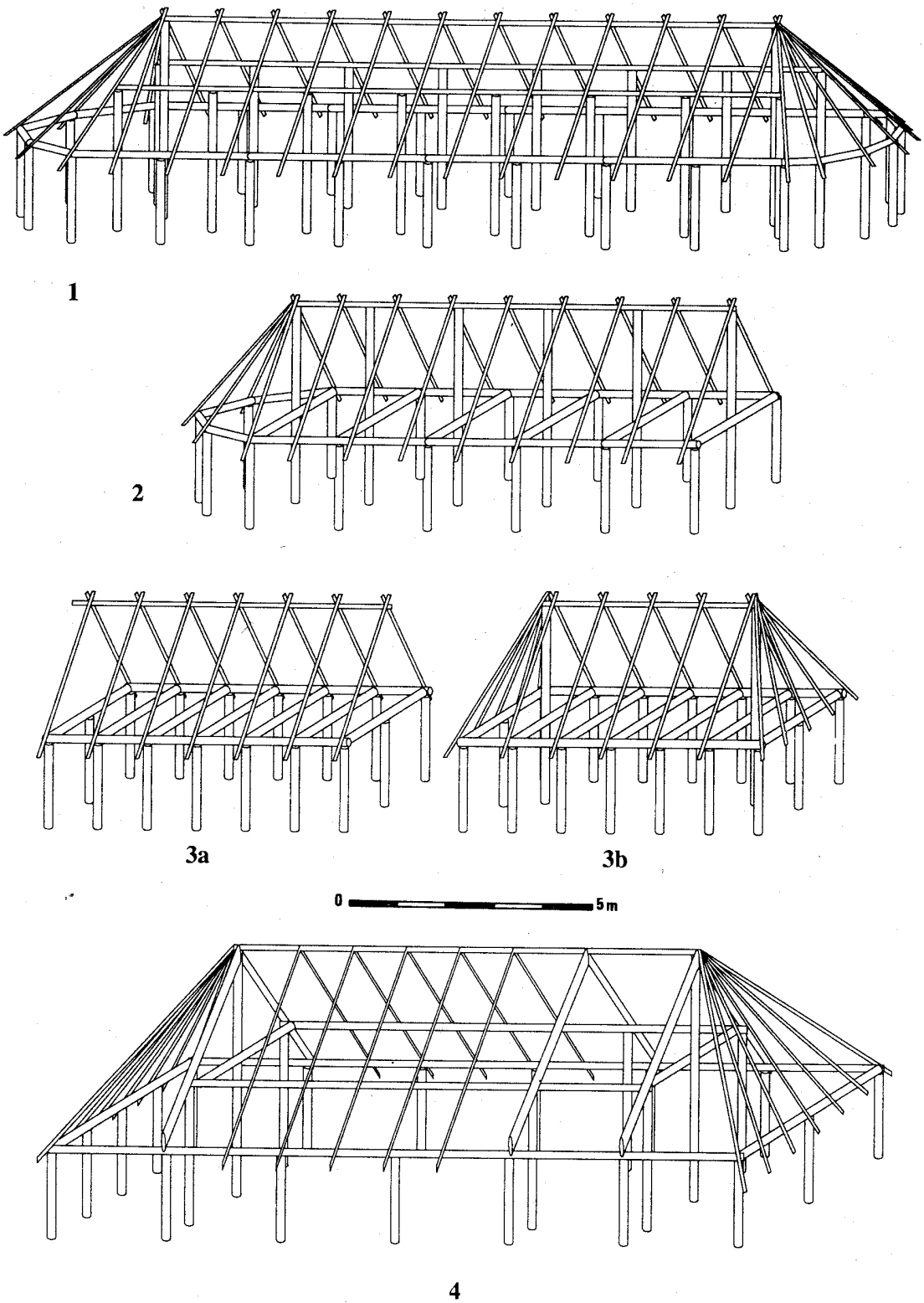


Fig. 2.3 The diachronical development of farmhouse types in the Moselle region in the Bronze Age and the Early Iron Age (from: Blouet et al. 1992). 1= Bronze Ancien, 2= Bronze moyen, 3= Bronze final, 4= Hallstatt Ancien

more than 200 sites are attested, which could point to a demographical increase.
Estimations of the population density for the MDS region diverge from four to seven persons per square kilometre for the Bronze Age (Roymans/Kortlang 1999). Some assume that the Late Bronze Age and the Early Iron Age are characterised by a demographical expansion, with its maximum in the Early Iron Age. This increase is reflected in the number of burial monuments which can be related to the number of territories (Roymans 1991; Roymans/Kortlang 1999, 38). However, for the northeastern part of the Netherlands the estimations for the Early Iron Age remain low: three to four persons per square kilometre (van den Broeke 1991, 254). Brongers (1976, 66) has indications for a population density of c. 1 person per square kilometre for the sandy areas in the Netherlands at the beginning of the Iron Age. In general the indications for a demographical growth in the Late Bronze Age and Early Iron Age are not always convincing (see also Fokkens 1997, 1998).

The Bronze Age and Iron Age farmhouse
In the course of the Bronze Age and the Early Iron Age, both in the south part (Lorraine) and north part (the Netherlands) of the study area, the individual farm houses underwent a similar development. The evidence from the two subregions will be presented here in short.
The examples of individual houses from the Early and Middle Bronze Age demonstrate the following picture (see figure 2.3).
In the Bronze Ancien (1800-1500 BC) it concerns large, rectangular, three-aisled buildings, with average dimensions of 17 x 6 metres, which wholly coincide with contemporary examples from North Europe (see chapter 5 below, sites of Frouard "Haut de Penotte"; Frouard "Z.A.C. du Saule Gaillard" with restoration phase! Aeroport Regional de Lorraine zone D) (Blouet et al. 1992, 181). The houses in the Bronze Moyen (1500-1250 BC) in this region are two-aisled and somewhat smaller, with average dimensions of 12 x 5 metres (see chapter 5 below, site of Crévéchamps). Numerous examples of settlements are known from the Late Bronze Age in the Lorraine region. In this period, the farmhouse is a very stereotypical, one-aisled building of small dimensions (9 x 5 metres average). In the Iron Age the dimensions of the three-aisled houses increase again (15 x 8 metres average).
The diachronical development of the farmhouses in Belgium and the Netherlands in the course of the Bronze Age and the Iron Age is very comparable to the French situation (figure 2.4).

Very few examples of Early Bronze Age habitation are known in this area, like the two-aisled house from Molenaarsgraaf dating from the Early Bronze Age (Louwe Kooijmans 1974) and a recently excavated two-aisled Early Bronze Age house in Noordwijk-Bronsgeest (Van Heeringen/van der Velde/van Amen 1998).
Later periods provide us with numerous examples of houses. Recent publications have facilitated access to this evidence: among others Fokkens/Roymans 1991; Schinkel 1998; Theunissen 1999. In the Middle Bronze Age (1800-1100 BC) the farmhouse is a three-aisled, long, rectangular building, with dimensions of 5 x 25 metres or even longer. In the course of the Late Bronze Age (900 BC onward), the length of the houses diminishes compared to that of the Middle Bronze Age houses in these regions (Fokkens 1997, 366). Instead of the previous 20 to 30 metres, the Late Bronze Age and Early Iron Age houses do not pass a length of 15 metre. In general, the houses remain of the three-aisled type. This phenomenon of the shortening of the houses from this period onwards cannot be fully explained. It could be related to a change in the composition of the inhabitants, i.e. a shift from extended families (or Middle Bronze Age multiple family households) to single families (Late Bronze Age nuclear family households) (Fokkens 1997, 366).
House plans in the Middle Iron Age are of the so-called Haps-type (see also figure 7.2). In general, the farmhouses in the Middle and Late Iron Age are c. 15 metres average in length, but they show a relative variety in sizes (Schinkel 1998, 188).

The introduction of the longhouse
The Early and Middle Bronze Age are characterised by the introduction of the so-called three-aisled longhouse, that is, the farmhouse in which two separate parts can be discerned under the same roof, normally interpreted as a living part and a stable part (see figure 2.4). Clearly discernible cattle boxes or posts set closely together sometimes identify the separate stable part in this house type. The stables could hold 20 to 40 heads of cattle (Fokkens 1997, 365; Schinkel 1998; Waterbolk 1974). This tradition knows an extensive distribution area. Numerous examples of this longhouse or byre house are known from Denmark, Germany, the Netherlands, Flanders to Central France (Crombé 1993; Dartevelle 1996; Harsema 1996).
Generally, this development is supposed to mark the introduction of the stalling of cattle within the farmhouse. Recently, however, some archaeologists have tended to doubt this view. Fokkens (1999) noted that in fact only very few convincing examples of Bronze Age houses with well-defined stall partitions are known. Apart from the oldest example of Loon-op-Zand (1750-1500 BC), the houses that do display stalls are generally dated later (e.g. the Emmerhout-type: after 1400 BC). On the other hand, he pointed out that the three-aisled houses without a clear stable part are a

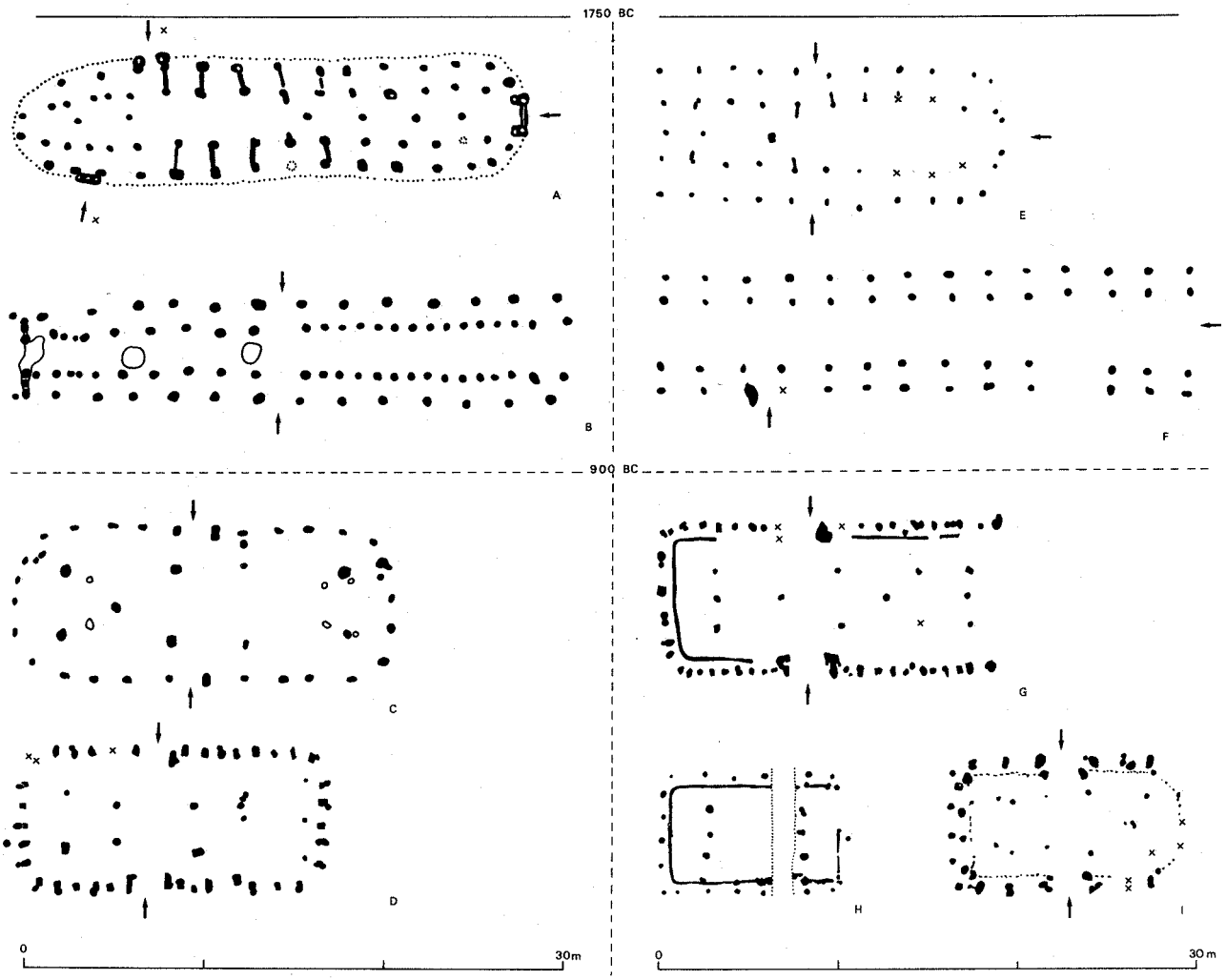


Fig. 2.4 The diachronical development of the farmhouses in Belgium and the Netherlands in the Bronze Age and the Iron Age (from: Fokkens/Roymans 1991). A/B= Angelsloo, C= Peeloo, D= Een, E= Loon op Zand, F/G/I= Oss, H= Den Dungen.

much older phenomenon (e.g. Dodewaard: 1782-1676 BC and the sites of Eigenblok and De Bogen Middle Bronze Age A).

In Lorraine, the evidence for the presence of stable parts in the longhouses is quite weak. The example from the site of Frouard "Z.A.C. du Saule Gaillard" will illustrate this. It yielded a partially preserved house plan (house 5) dating in the later phase of the Bronze Ancien (1700-1600 BC). Remains of the original surface are absent, but in analogy to Dutch and Danish examples of longhouses the French archaeologists suggested a bipartition that represents a division between the living area and the stable area (see figure 2.2; Blouet et al. 1996, 435). Roymans tend to doubt that the regions in the löss landscapes of the Rhineland and Northern France belonged to the Northwest-European longhouse-*Hauslandschaft* (Roymans 1996, 56). We must await further new evidence before we are able to convincingly demonstrate such a powerful contrast in housebuilding traditions between the northern sand-region and the southern löss region as Roymans does.

In the archaeology of Northwest Europe, a series of explanations are formulated for the introduction of the phenomenon of the presence of a separate stable part in the longhouse (see, for an overview, also Zimmerman 1999). They do not exclude each other and are sometimes interdependent. The most common interpretations are:

• Long lasting winter stalling with the possibility of feeding the animals. Several authors relate the evolution of the longhouse to the possibility of stalling and feeding the animals in wintertime (Behre 1998; Roymans/Fokkens 1991, 8; Zimmerman 1999). Behre (1998) presumed that from the Bronze Age onwards cattle was kept indoors during wintertime and

was fed with leaf fodder, in contrast to earlier periods (Funnel Beaker Culture) when the cattle was continuously kept outside. Also Karg (1998) supposed the cattle were fed indoors, with grasses, hay, straw etc. Zimmerman (1999, 309) pointed to the advantages of byre feeding during wintertime, with regard to the limited resources of grassland in wintertime. The introduction of the byre could mean an answer to a possible increasing demand on agrarian ground. Winter stalling to protect cattle against low temperatures appears unnecessary in a moderate climate as that of our regions. Also Zimmerman stresses that especially horned cattle, like other livestock, can be outwintered in Central and even Northern Europe without any problem (Zimmerman 1999, 304). Some authors see technological problems in relation with feeding in wintertime. Bronze Age implements would not suffice to collect large amounts of fodder and storage facilities for these required large amounts have not yet been demonstrated (Louwe Kooijmans 1998) [2].

- Protection against raids. Some authors relate the presence of stables in the house to the necessity of keeping the cattle inside at night, as a security measure in the case of threats of raiding (Louwe Kooijmans 1998; Harsema 1993, 106; Fokkens 1999). For groups for which cattle takes in a central position as prestige goods or capital this appears a reasonable option.
- *Homo domesticus cum bestiis*. Harsema (1993), describing various examples of Middle Bronze Age houses in the Dutch province of Drenthe, distinguished the evolution from the large Bronze Age house without a stalling capacity, associated with a separate stable building or a corral (Roden, Dalen and Angelsloo, Hijken), to the well-known Emmerhout-type longhouse. This transition takes place around 1400 BC, and is interpreted by Harsema in terms of the changing cultural and economic role of animal husbandry. In his view, the presence of the cattle within the living area can be related to the wish of having a stronger familiarity with the animals. The emotional value of cattle largely increased in the Middle Bronze Age society and required increasing care. This explains why they should make up a part of the household as housemates (Harsema 1993, 107). Also Roymans explains the presence of cattle stalled within the house in terms of pastoral ideology, which in his view characterised our regions until the Roman period (Roymans 1996; see also Fokkens 1997, 366).
- Assistance of calving cows. Brinkkemper (1991, 128) noted that a calving season could have been created by allowing bulls access to cows only for a restricted period. He also noted the particular advantages to a late winter/early spring calving season. Therefore, the suggestion is made that the cows were stalled over the winter, so that they could be watched and may have been helped in calving if necessary. In addition, the production of milk of a cow would be stimulated by the close presence of a newborn calf (Brinkkemper, pers. comm.).
- Making use of the warmth of the cattle. It is sometimes assumed that the animals kept in the house would give off warmth to the people who stayed in the same house. Zimmerman (1999, 308) described several archaeological experiments that clearly demonstrate that warmth from cattle (as well as from a fireplace in the house) contributed little to the mean temperature in the farmhouse, which was almost entirely dependent upon outside temperatures.
- Possibilities of collecting dung. Some refer to the relation of the introduction of the use of manure in agriculture and keeping cattle inside farmsteads or corrals. The presence of stables in the house enabled the farmers to collect the dung and hence manure the arable land (e.g. Fokkens 1997, 366; 1998, 487; de Hingh 1998; Louwe Kooijmans 1993; Zimmerman 1999, 309).

This enumeration of explanations of the introduction of the longhouse seems to imply that they would automatically exclude each other. Naturally, combinations of more functional interpretations of this phenomenon may very well lie at the origin of this phenomenon. Apart from that, it is conclusive that an important role was ascribed to cattle in the Bronze Age society, be it purely agro-economic or in their relation to people, or both.

The latter explanation, with regard to the use of manure, is especially of interest in our study of agriculture. If a systematic use of cattle dung as manure was really introduced in agriculture as early as the Middle Bronze Age, this would have had a major influence on the agricultural system. I believe that we can assume that the Middle Bronze Age farmer was aware of what the use of manure could mean to agricultural production (see also chapter 9 for the archaeological evidence of manuring). Could this awareness explain the presence of cattle within the walls of the living house?

For a better insight into the relationship between cattle and people and food through the use of manure in this period, we should make use of a differing line of evidence. We may do so by focussing on the relation pattern between the role of cattle (as manure producers) and their social and ideological contexts. Comparative studies of the mythology in Indo-European cultures by Lincoln (1986) have placed this agricultural phenomenon in a wider (cosmological) embedding. Lincoln's analyses on Indo-European mythology are often of great relevance to archaeology, esp. when it comes to the role of cattle in pre-modern European societies. These myths usually contain stories about the creation of the cosmos, of people, as well as of the creation and origin of food, plant and animals. Recurring elements in these Indo-European myths are the so-called homologies and alloforms that represent the equalisation of aspects of the micro cosmos and the

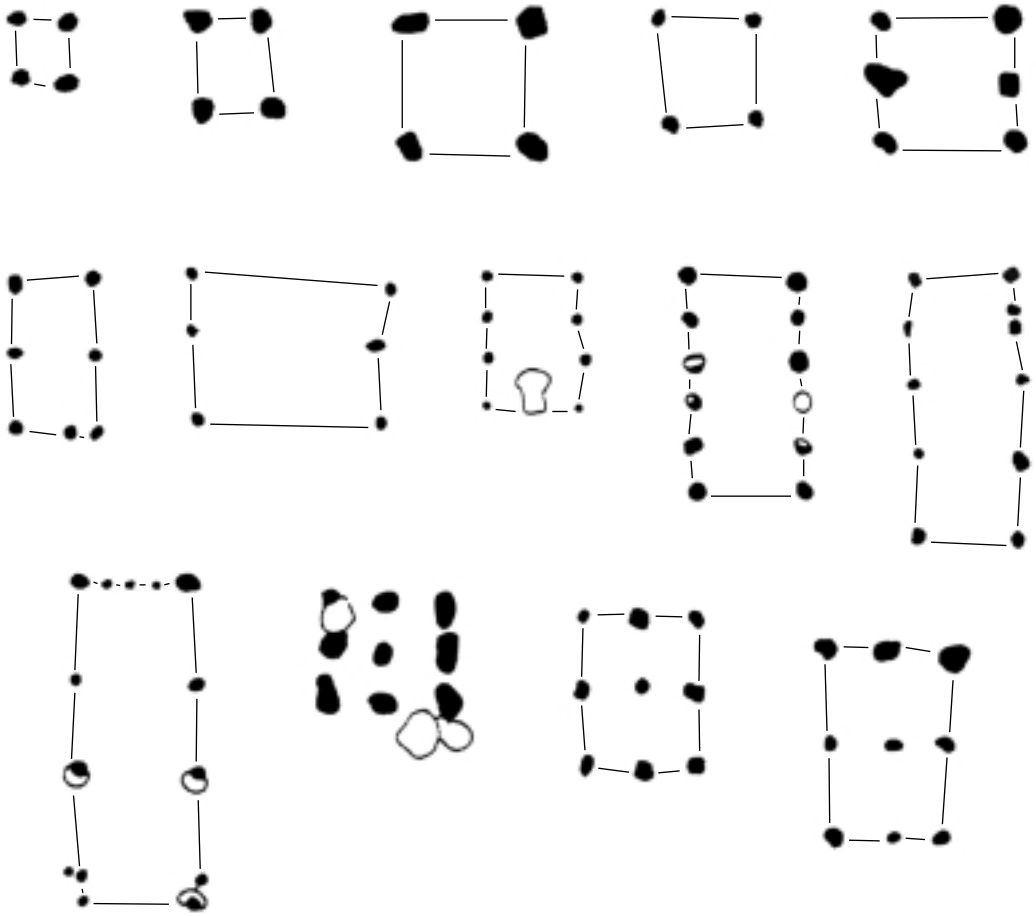


Fig. 2.5 Iron Age four-, six- or more-posted granaries (from Le Brun-Ricalens et al. 1994)

macro cosmos, e.g. breath and wind, flesh and earth, blood and water.

Among others, Lincoln (1986, 65-86) describes the role of cattle as an important theme in Indo-European so-called sitiogonic myths, that is, the myths of the creation of food. In these myths a primordial animal, usually domestic, plays an important role. The animal usually specified as an ox or a bull is sacrificed by man and dismembered. At death the body of the bovine, in these sacrificial myths, is transformed into food, in its liquid and solid components. The bovine becomes more specifically milk, butter, water and edible plants, especially grains. In a word, cattle were seen in these myths as an alloform of fluids plus edible plants. Within the normal experience of agriculturists (also in Bronze Age society) there are tangible signs that support such a homology, because on the one hand cattle produce food from their bodies, in the forms of fluids (milk, blood, and urine) and also plants. These plants grow because manure stimulates the growth of grasses and grains which is quite obvious to anyone who grazes cattle over any length of time. On the other hand, it is evident that cattle thrive and grow as a result of consuming fluids (water and milk) and plants. In this way a continuous cycle of fluids and plants circulates from cattle to food and from food to cattle ad infinitum (Lincoln 1986, 75).

Awareness of this Indo-European tradition of myths, and the role of cattle in myths on the nature and creation of food, might help us to a better understanding of the importance of cattle in prehistoric society. They probably played a part as offerings in rituals connected with the agrarian cycle. Cattle probably also had a primary role in this period to the origin and the nature of food: agriculture and the endless recreation of food by the use of their dung. This is illustrated by the recurring theme of the continuous cycle of food between humans, animals and food (plants) in the Indo-European mythical tradition. Furthermore, it may also explain their physical presence close to the people (that is, their presence in the same house). As people depended on them for (the creation of) food and together with the cattle were part of

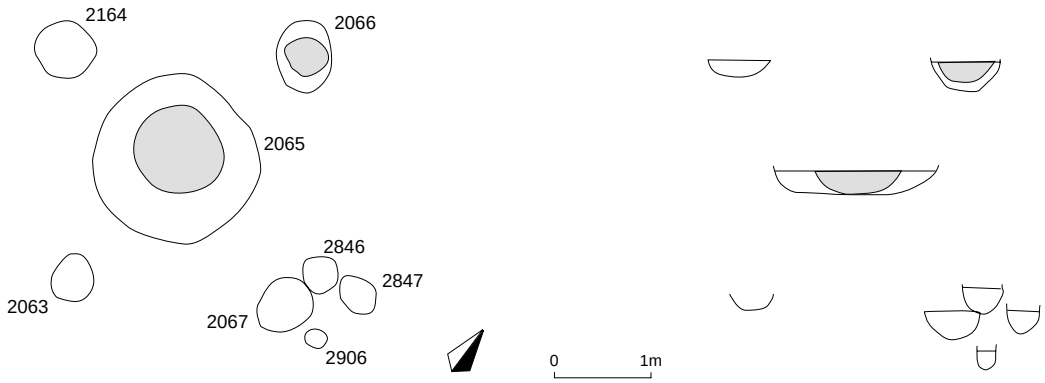


Fig. 2.6 Crévéchamps, zone B. granary 12 (drawing by Petra de Jong)

the same continuous cycle of the creation of food. To the Bronze Age agricultural communities this relationship was daily present and emphasised and given concrete form by their daily agricultural practices.[3]

The organisation of the farmyard

The spatial organisation of the Bronze Age and Early Iron Age farmyards shows some strong characteristic elements. A rather homogenous layout is found not only in the Netherlands, Belgium and North France, but also virtually in the whole of Northwestern Europe. The botanical samples investigated for the purpose of this study of agricultural change all derive from a variety of settlement structures as described in this section.

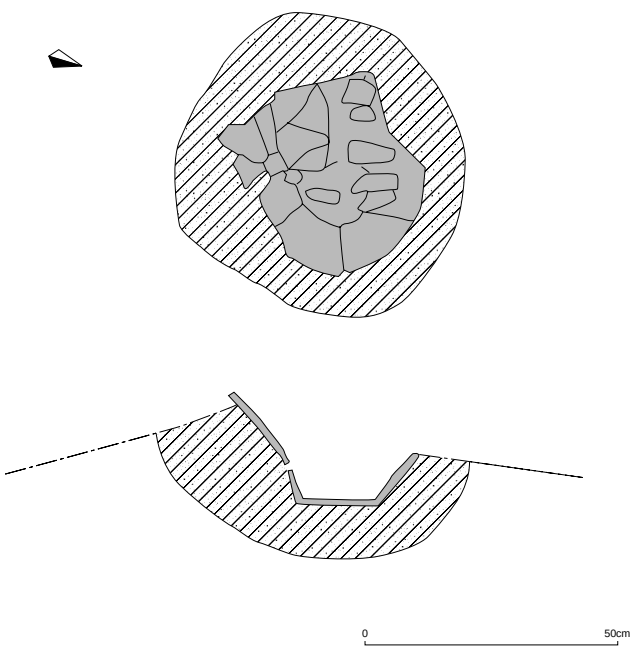


Fig. 2.7 Crévéchamps, zone B. feature 2907, vase-silo

In general, associated annex buildings and various structures surrounded the farmhouse with which it formed a well-defined productive unity. It especially concerns various types of storage possibilities, like built structures, four-, six, eight, or nine-posted annex buildings, interpreted as granaries and barns (figure 2.5, 2.6). It is generally assumed that crops, mainly cereals, were stored in the granaries. This assumption however is not often confirmed by the presence of botanical material. Sometimes, only when there are apparent indications of fire, large quantities of charred crops are found.
In addition, pits of various natures are found on virtually all late prehistoric farmyards, i.e. underground structures like storage pits and silos or vase-silos (underground storage vessels, figure 2.7) associated with agrarian activities. Silos are characterised by their cylindrical, truncated conical or bell-shaped lay out (figure 2.8). Sometimes a clear layer of charred plant remains is recovered on the bottom. A remarkable phenomenon in the Hallstatt period in the Moselle region are large storage areas, spatial concentrations of large numbers of storage features (granaries, pits and silos) whether or not surrounded by enclosures (figure 2.10).
In Lorraine especially, so-called extraction or loam pits are regularly recovered on the farmyards, and various fire structures, like domestic ovens and hearths. In this region, the so-called Polynesian ovens are regularly found dating from the Middle Bronze Age onwards (figure 2.9). These ovens are built up from stones, with a length of 1 to 2 metres and a maximal width of 1 metre, and are normally to be found in the periphery of the settlements (Blouet et al. 1992, 185). At some sites in the study area, wells are found in large numbers on the yards, sometimes in a remarkable consecutive continuity of some centuries; they are however more rare in the Netherlands than in France (Schinkel 1998).
Finally, from the Middle Bronze Age onwards sometimes parcelling structures are found around the farmyards, for example posted rows or systems of ditches. An example of a similar form of demarcation of land was demonstrated in

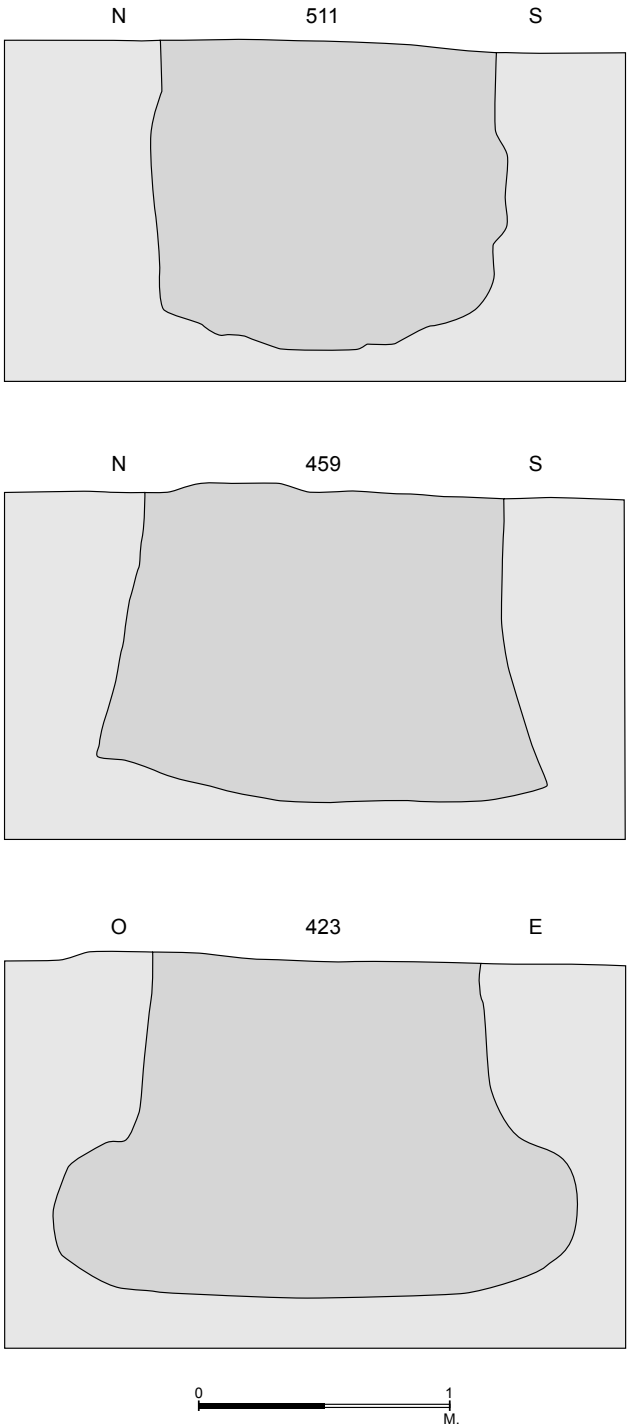


Fig. 2.8 Rémerschen - Schengerwis. Typology of silos: examples of cylindrical, obtuse angled or bell-shaped silos (from De Ruyter/Le Brun-Ricalens 1993) (drawing by Jan Maarten Luursema)

Zijderveld (prov. of Gelderland) (Theunissen 1999, figure 2.11). Large numbers of posts were recovered here, associated with a Middle Bronze Age house. Two different types of post rows could be distinguished. A single type, consisting of one single row of posts with a distance of 15 to 20 cm between the separate posts. Possibly branches of willow were twined between the posts of these fences. The double row type consists of double rows of posts with a distance of 1 to 3 metres between the separate posts in the length direction. In the space between the stakes (a space of 10 to 15 cm) horizontal beams or branches may have been placed. The height of the fences will have been at least one metre. The single type occurs in the centre of the settlement and is interpreted as temporary, mobile constructions that enclosed the compounds and probably formed a cattle drift or temporary stalling area. The double-posted fences were found mainly at the periphery of the site and seem to have served as a more permanent enclosure. It is interpreted as the demarcation of the arable fields. The fences would have kept the cattle or wild animals away from the cultivated land, or would have kept the cattle on the fallow fields (Theunissen 1999).

Burial customs in the Bronze Age and the Iron Age

The study of burial customs forms an important part of the studies of the metal ages. In our study region burial customs underwent two major transformations, i.e. the rise of the burial mound and at a later stage the development of urnfields. The first important transformation is the shift from the collective tombs of the Neolithic to the individual burials

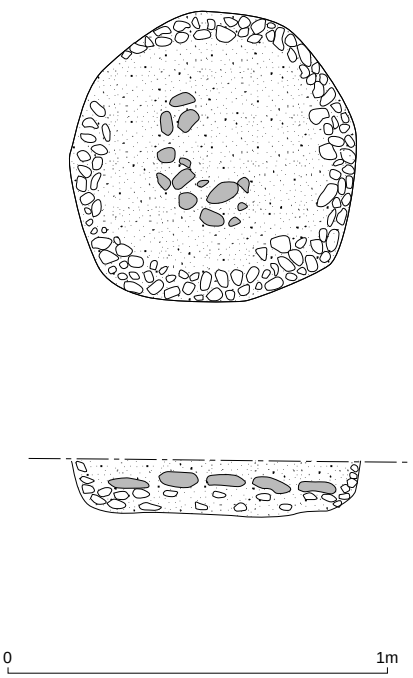


Fig. 2.9 Crévéchamps, zone A. Feature 1064, so-called polynesian oven

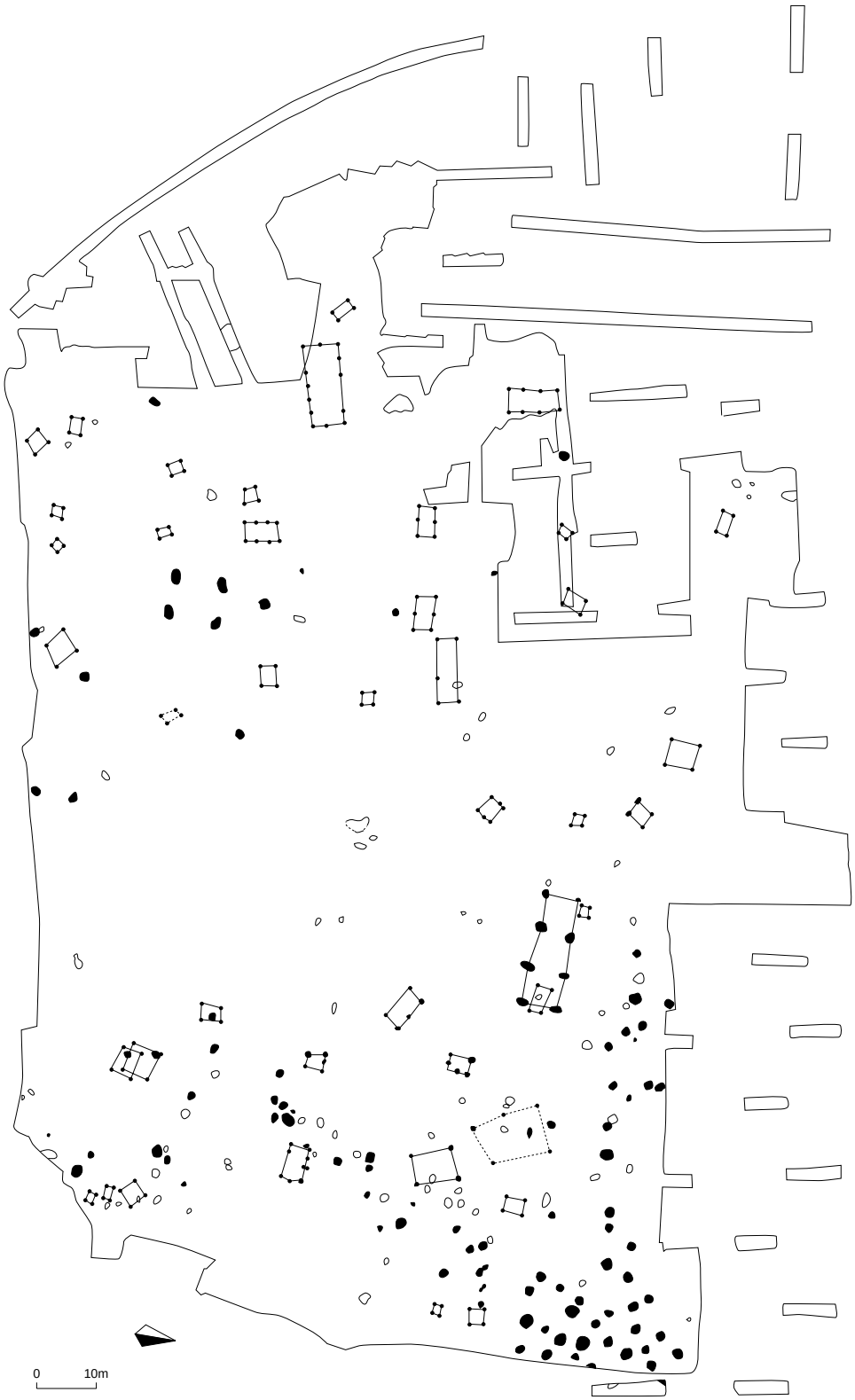


Fig. 2.10 Rémerschen - Schengerwis, sector 1. Iron Age

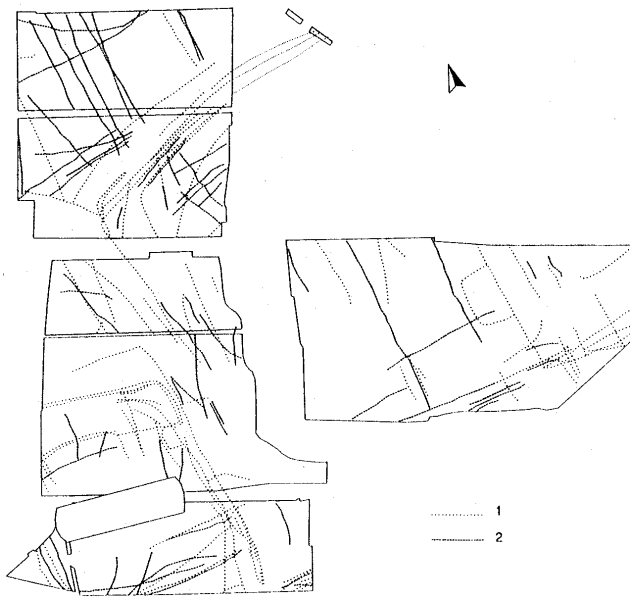


Fig. 2.11 Zijderveld. Middle Bronze Age post rows, 1 = single posted type, 2 = double posted type (from: Theunissen 1999)

underneath earthen barrows in the Late Neolithic and Bronze Age, which marks a fundamental change in burial customs. Until the Late Bronze Age, the barrow continues to be the main burial form. During the Late Neolithic and the Early Bronze Age, the barrows were located solitarily in the landscape, but from the Middle Bronze Age onwards also groups of clustered barrows appear (e.g. Toterfout-Halve Mijl, Theunissen 1999). For the Bronze Age there are indications that the barrows were predominantly located in the vicinity of contemporaneous settlements.
Barrows are often interpreted as (new) forms of expression of affinity with a certain territory by one family or a larger social unity (see also section 2.5 on claims on land). Some authors stress the continuity between the previous Neolithic and the Bronze Age by stating "we assume that in the course of the Neolithic some sort of fixed territorial division of the land had developed. In the province of Drenthe, the TRB megalithic tombs had a, relatively early, marking function in this context. In the Beaker period and to a larger extent in the Bronze Age barrows fulfilled the same role" (Louwe Kooijmans 1998; see also Fokkens 1999, 369; Barrett 1994, 47). Not every member of the community was buried under a barrow; only c. 15% of the population received this special treatment (Lohof 1993, 1994; Theunissen 1999).
In the Late Bronze Age (Ha A2/B1) a new mortuary ritual was introduced that was materialised in urnfields. From this period onwards this phenomenon of urnfields emerged throughout Europe: long-term cemeteries with a clustering of graves consisting of large numbers of low barrows located close to each other. It is assumed that most members of a local group were buried in these urnfields, receiving individual grave monuments. One urnfield probably belonged to a group of 10 to 20 persons, that is, the inhabitants of two to four farmhouses (Fokkens 1997, 370; Waterbolk 1987). Below, I will go further into the relation between the introduction of the urnfields in the Late Bronze Age and a possible gradual introduction of a new agricultural system (the so-called Celtic-field agriculture, see also Roymans/Kortlang 1999, 36) and a possible increasing importance of claims on the agricultural land (-scape) by these urnfield communities.

2.3 Archaeological evidence of agriculture and agrarian land use

In this section, I will briefly point out the archaeological evidence on subsistence economy and the arable fields in our study period.
It is generally agreed upon that the agricultural system practised during the Bronze Age and the Early Iron Age was based on local subsistence, which implies that the arable and pastoral products were produced as well as consumed locally. From the archaeozoological and archaeobotanical evidence it appears that the subsistence economy in the study region was based on a combination of arable agriculture and animal husbandry. At least from the Bronze Age onwards, but possibly already in the Late Neolithic, it concerns the phenomenon of the so-called mixed farming economy, that is, a system in which agriculture and crop husbandry are both important, and are complementary of and dependent on each other. Cattle would take a central place, and at the same time were serving to arable agriculture, as draught animals and manure producers (see also section 2.2). In the Bronze Age live stock consisted of cattle as well as of sheep, goat, pig and horse.
In the Middle Bronze Age, the introduction of the longhouse, as described above, was related to the increasing importance of raising or keeping cattle. The transition from this large Bronze Age longhouse to the smaller farmhouse in the Late Bronze Age and the Early Iron Age could indicate a shift in husbandry, i.e. an increasing importance of pigs and sheep breeding and a decreasing importance of cattle. This would explain the lower number of stalls within the house in this period (Roymans/Fokkens 1991, 10). However, the decreasing dimensions of the Late Bronze Age and Early Iron Age houses can be related to the changing composition of the families occupying the farmhouses, as well as the changing (ideological) role of cattle (see above).

Agricultural regimes
As I noted before, not much research has been carried out so far in archaeobotany with regard to agricultural regimes in our study region (see chapter 1). Naturally, by definition

archaeobotanists investigate questions regarding the nature of agriculture, but in many cases this is restricted to the presentation of the plant species recovered in a certain period. For an overview of cultivated species from our study region see e.g. Bakels (1991) for Atlantic Europe and in particular Marinval/Ruas (1991) for Northern France. Where the cultivation of crops is concerned, cereals (mainly barley, spelt and emmer wheat) seem to have played a dominant role. Besides cereals also other crops, like pulses and flax are known to have been cultivated in this period. The presence of these species has often been recorded in seed assemblages from settlement terrains as described above. Not much is known on the role of activities additional to animal husbandry and plant/cereal cultivation, like hunting, fishing and the collection of wild plants or fruits, in the Bronze Age and Iron Age. As the quantitative evidence of the remains of these activities decreases in this period, it is generally assumed that the importance of these subsistence sources gradually declined. The limited finds however indicate that hunting and gathering still play a part in later prehistoric economy.

Arable fields

The actual arable land that was in use for agricultural cultivation in these periods remains rather enigmatic to us. Arable fields from the Bronze Age or the Early Iron Age in the MDS region or the Moselle region have never been completely investigated. Important evidence on their origin, size, shape and exploitation is lacking, so we depend on various estimations and interpretations that have been made on these aspects (see e.g. Fries 1995).

Regularly, incomplete or isolated parts of arables are recognised in the field by the presence of ard marks or evidence of parcelling. Scratches caused by the prehistoric plough (ard-marks) are very regularly discovered from the Neolithic onwards, throughout large parts of Northwestern Europe. They are often found under burial monuments of various dates from the fourth millennium BC onward, but are also known from other contexts. We should note that ard marks found beneath a barrow could perhaps be interpreted as an aspect of burial rites rather than of regular agriculture (e.g. Rowley-Conwy 1987), but this interpretation remains highly controversial (see e.g. Rasmussen 1992/1993, 96-7).

The actual implement itself is hardly ever found (see van der Poel 1960/1961; van der Sanden 1993/1994). Drenth and Lanting (1997) demonstrated that the current state of research does not allow for any far-reaching conclusions about the introduction of plough agriculture in the Netherlands.

Archaeological evidence and analysis of former arable land in Belgium and the Moselle region has been very scarce until now. Actual investigations of the kind are to my present knowledge non-existent. An exception to this is formed by the diachronic study very recently started in the region of Lorraine on developments in deforestation and agricultural land use form the Neolithic onward (Blouet/Richard/Ruffaldi, no date). The study of the so-called palaeo-channels in this area led him to reconstruct a possible parcelling system of living hedges and the exploitation of palaeo-channels as enclosures of cleared land in the period of 1300 - 700 BC (Guilaine 1991, 72-73).

Well-known phenomena from later prehistory are the large arable field complexes (field systems) that are recorded especially by air photography. In the whole of Northwest Europe from Scandinavia to the Jura and from Ireland to Estonia traces are found of structures that demonstrate a certain organisation of the landscape by parcelling. Synopses may be found, among others, in Brongers (1976), Bradley (1978), Fleming (1987) and Fries (1995).

Two important groups of field systems are the coaxial (or cohesive) fields and the so-called Celtic fields. These extensive field systems with a regular layout consist of large numbers of blocks or strips of enclosed land. The plots of land of a *coaxial field* system are laid out following one prevailing axis of orientation or running at right angles to it. Outside the study area numerous examples of these field systems have been recovered in Great Britain (Bradley 1978; Fleming 1987; 1989a; 1989b). These systems can have enormous dimensions: in the south of England they can measure up to 5 square kilometres. Fleming (1987, 188) has defined 100 ha as a lower limit. The mean sizes of the individual plots of land are 2500 square metres (in Great Britain) to 1200 square metres (in the rest of Europe).

Celtic fields, defined by Brongers (1976, 102) as "a prehistoric parcelling system of which the parcels are (almost) completely surrounded by low banks consisting of stones, sand or a mixture of the two, and laid out for agricultural purposes", are not by definition coaxial. They reflect an aggregate type of field system in which a pattern of fields has been produced by a process of piecemeal land enclosure, instead of a synchronous layout (Bradley 1978). No single chronological horizon can be defined for the development and use of these coaxial and aggregate field systems. They have existed in various periods in various places. The dating evidence for the systems is very uncertain: the earliest systems in general can be dated from the Bronze Age. The main period of laying-out and use of the Celtic fields seems to be between 500 BC and AD 500 (Fries 1995).

France is rarely cited in the inventory of Celtic fields. This should not strike us as strange as little evidence for this phenomenon is known here. However investigations in recent years have rapidly made up for this arrears. Outside of the Moselle region the research and evidence of similar agricultural land boundaries is increasing (Audouze/Buchsenschutz 1989; Guilaine 1991, 70).

Dutch Celtic fields research

In the Netherlands examples of similar Celtic fields systems, are known on the Pleistocene soils in the east, central and south part of the country. The ones in Zeijen (prov. of Drenthe) and Vaassen (prov. of Gelderland) are the largest and best known, but also in the provinces of Friesland, Overijssel and North-Brabant remains of Celtic fields are documented. An example from the MDS region recovered by air photography is the complex near Riethoven (Milikowski 1985; Slofstra 1991; see figure 2.12).

As little research has been carried out so far on these Celtic field systems (but see below), their origin, chronology and agricultural exploitation remains rather enigmatic to us. The sometimes very extensive arable field systems are recognised by their typical layout of small parcels (of average 35 x 35 metres) surrounded by wide, low banks. It is quite

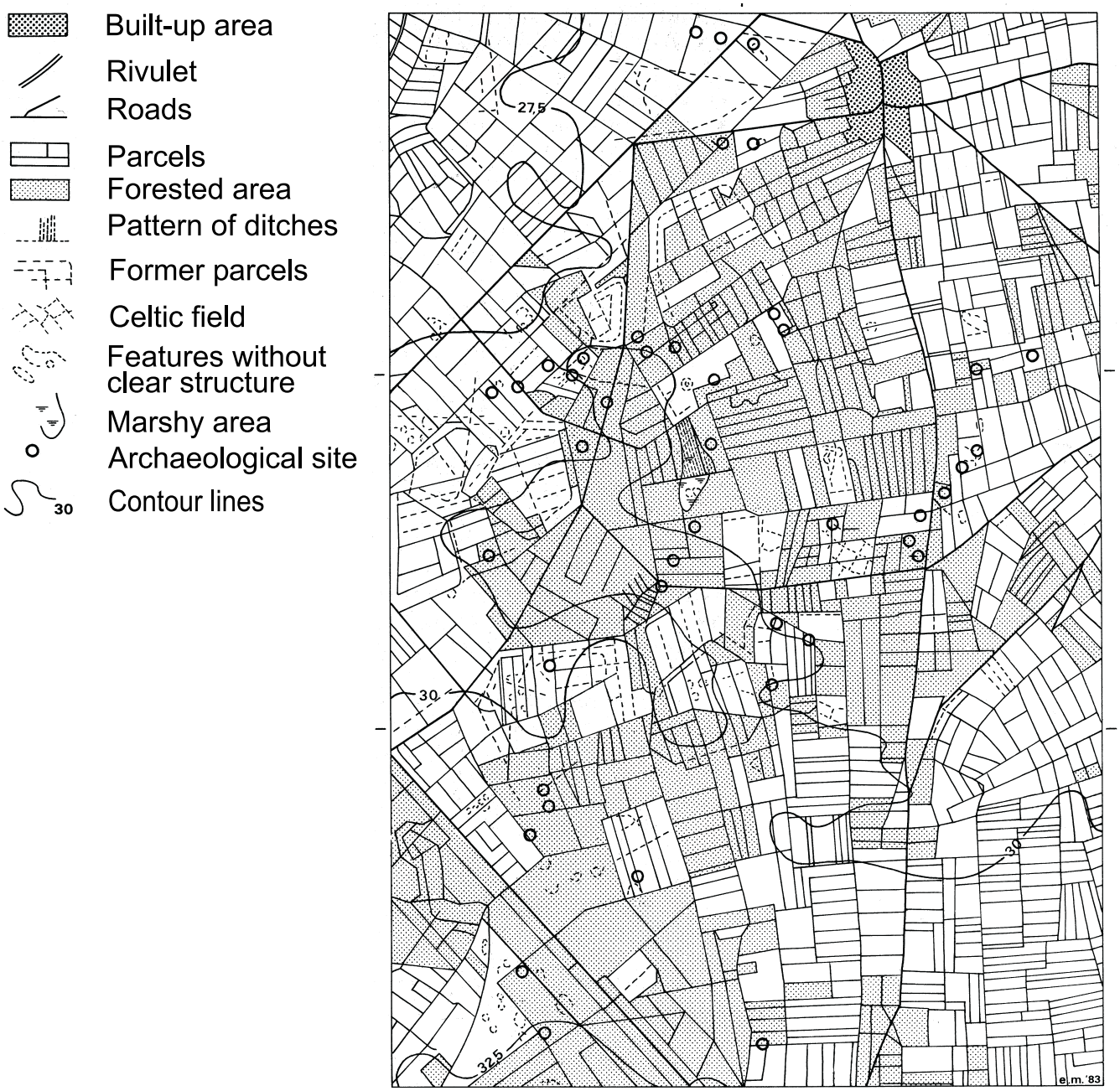


Fig. 2.12 Interpretation of an aerial photograph of the region Eersel-Riethoven-Bergeijk (from: Milikowski 1985). The traces of a Celtic field system are indicated.

probable that the Celtic field agriculture has its origins in the Urnfield period, although the typical appearance of Celtic field complexes with high broad walls is of a later date (Roymans 1991).
In 1967 and 1968, Brongers excavated a Celtic field system near Vaassen (Brongers 1976). The archaeological excavations of the Vaassen complex by Brongers and the pollen-analysis carried out by Casparie, enabled them to distinguish several phases of agricultural exploitation of the area. The old arable layer, which was brought into existence by making small clearances and using the soil as arable; the pre-Celtic field phase during which the forest was subsequently cleared on a much larger scale for agricultural purposes, and the Celtic field system itself with a change in agricultural methods. The laying-out and use of the three successive phases can all be dated to between c. 600 and 300 BC. According to Brongers, the flourishing period for all Dutch Celtic fields lasted from c. 600 BC to c. AD 200. The introduction of the phenomenon of parcelling the land can be associated with changes in agricultural technology like the beginning of multiple-course rotation and the transport of humus to the fields (Brongers 1976, 69).
In 1969-1974 a Celtic field complex of 1 square kilometre was partly investigated in Hijken (Drenthe) (Harsema 1982, 1991, 1992). The settlement belonging to the Celtic field was found as well, which is quite exceptional. The Early Iron Age settlement (6th century BC) was located in one of the corners of the field system. North-west/south-east banks divided the system in long strips. Each individual house was built on a separate plot within these strips. The Iron Age farms were surrounded by rows of posts of which the orientation corresponds with the pattern of the Celtic field system (see Harsema 1982, 155). Interestingly, the orientation of the previous Middle Bronze Age house plans is also adapted to the parcelling of the system (Harsema 1991). The size and outline of the individual plots within the field systems have given rise to speculation on yields and whether these would suffice for a group of people of a certain size. In Hijken, we could assume that probably all the plots in one strip were used and/or owned by one family group, but according to Harsema the yield of the c. 10 plots of land (of 30 x 40 metres each) per strip would not have sufficed for one family. He suggested that each separate family of this community used another whole strip of land within the field system (Harsema 1982, 154-56). It is further assumed that the size of the plots in a Celtic field was chosen so that one field (c 0,1 hectare) could be ploughed, sown and harvested on one day (Reynolds pers. comm. cited in Brinkkemper 1991, 153; see also Brongers 1976).
Recently, the Celtic field complex of Noordse Veld near Zeijen was investigated by a group of researchers (Spek/Groenman-van Waateringe/Kooistra, in prep.). These interdisciplinary investigations have cast new light on the genesis, development and exploitation of the Celtic field system. It demonstrates a long continuity of exploitation of (parts of) the field system (or its predecessors) from the Middle Bronze Age onward. Four phases of exploitation of an arable plot of land and its adjacent bank were attested. First, a Late Neolithic and/or Bronze Age phase of pre-Celtic extensive agriculture was present. The successive Late Bronze Age and/or Early Iron Age demonstrates the use of the ard, but according to the authors was still an extensive early Celtic field agriculture. Banks are laid around the complex in this period. Phase 3 is dated in the Middle Iron Age (4th century BC) and is characterised by a small raise of the wall, extensive agriculture and the use of the ard. The presence of charcoal points to burning which is related to a long fallow period of 15 years (so-called bush fallow, see chapter 3). The end phase (Late Iron Age, Roman period) demonstrates evidence for a strong raise of the wall, manuring and intensive soil working. In the course of time the cultivation probably shifted from the small parcels to the walls, that were now very wide, because of a growing need for fertile arables (see also Zimmerman 1976, 88-89).

2.4 The agricultural land use system in relation to settlement dynamics

Late Neolithic and Early and Middle Bronze Age
The Late Neolithic, and the Early and Middle Bronze Age of Atlantic Europe are generally seen as a period of a large agricultural expansion. Many authors suppose, however, that the agrarian system in this period would still be characterised by a loose, highly ephemeral exploitation of agrarian land (Barker 1985, 175-179, Blouet et al. 1992, Louwe Kooijmans 1995; 1998, Rösch 1996). In their view, the agrarian land use went through a long-term cycle. A plot of arable land would be prepared for cultivation by removing and burning the natural vegetation (slash-and-burn). After a single agricultural use the fields were left behind and the soil regained fertility by a long period of fallow. The determinative factor here was the continuous search for fertile soils to guarantee the food production. The decrease of nutrients is believed to be the causal factor to regularly displace the arable fields.
Louwe Kooijmans (1995; 1998) noted a direct relationship between the phenomenon of the shifting settlements in the Bronze Age and this specific agricultural system of regularly displacing the arable fields, i.e. shifting fields. In his view the agricultural regime explains the powerful mobility of settlements in this period (see also Aaby 1993, 19). Others assumed however, that in the (Middle) Bronze Age the fields and cemeteries regularly changed place as they followed the shifting settlements (Roymans/Fokkens 1991, 12; figure 2.13). Here, the determinative factor is the short life cycle of the farmhouses (25 years average).

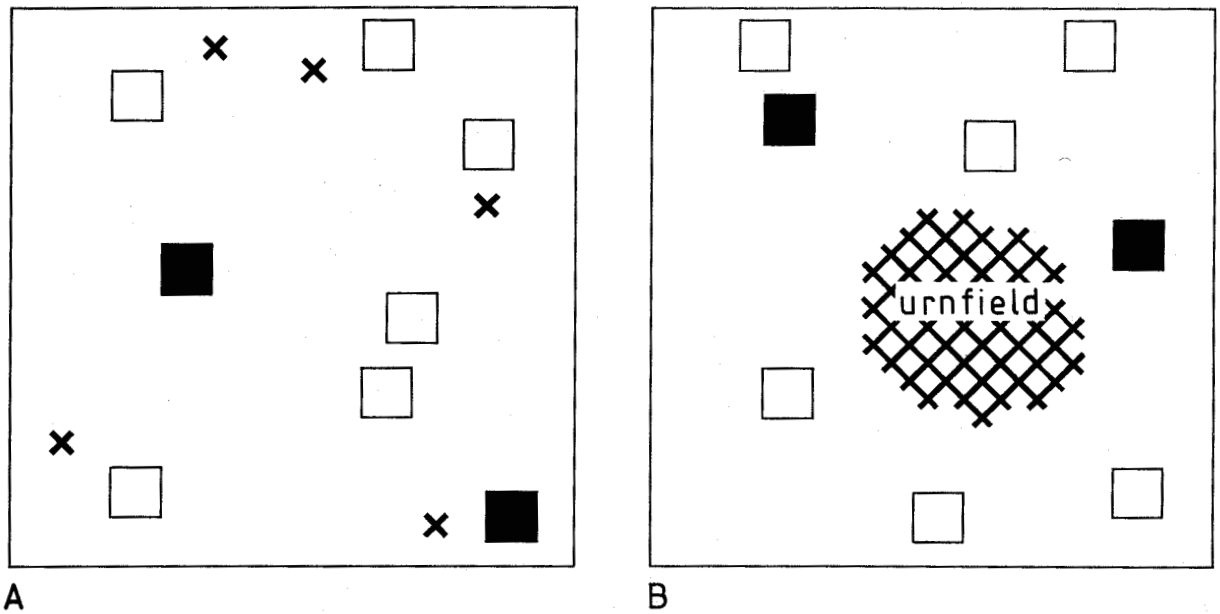


Fig. 2.13 Model of the internal structure of a settlement from the Middle Bronze Age (A) and the Late Bronze Age/Early Iron Age (B) in the Netherlands (from: Fokkens/Roymans 1991). A: settlement consisting of two contemporaneous farmsteads that change their location each generation. A few isolated barrows are temporally used for a local group. B: settlement consisting of two contemporaneous farmsteads that change their location each generation, while the related urnfield keeps the same location. ■ = farmstead, ✕ = barrow, □ = abandoned farmstead from other habitation phases.

A different group of scholars assume that in the Bronze Age the agricultural system had a more fixed character. Fokkens (1997) related the rise of probably systematic use of the ard in this period with a similar change in agrarian land use. A prehistoric plough cannot be used in fields that have been disposed of their original vegetation only once, because of the presence of obstacles, like remaining stumps and boulders. That is, the combination of a short-lived exploitation of arable fields and a systematic use of the ard is impossible to imagine. A long-term exploitation of the same fields makes the systematic use of the ard a possible option (see also Gilman 1981, but see Halstead 1995). Some people claim that plough agriculture was introduced in the Netherlands as early as the Late Neolithic (around the beginning of the third millennium BC) (Fokkens 1986; Van der Waals 1984). As we saw before, discoveries of ard-marks are numerous all over Europe from the fourth millennium onward (see section 2.3). However, the origin and way the ard was systematically introduced in these areas still remains unclear (Drenth/Lanting 1997; Fokkens 1998; Pronk 1999; Tegtmeier 1993; Fries 1995).

In Belgium and Luxemburg research is too little advanced to be able to make statements on the settlement system and the agricultural regime related to it. In the north of France, especially in Lorraine, the evidence enabled the archaeologists to speculate on this matter. On the basis of settlement evidence the archaeologists here assume that the agrarian land use system in the Early and Middle Bronze Age was very mobile. As described above, here the shifting settlements model is also put forward according to which the habitation in the Early Bronze Age was isolated, dispersed over the landscape and not bound to a fixed territory. The duration of occupation was short: for one generation, or the lifecycle of a house, which would be at the most 30 years (Blouet et al. 1996, 440). It is assumed that this settlement system was combined with an agricultural system that was also very mobile. The mobility of the settlements was the determinative factor in the short cyclical (once-only) use of the agricultural parcels that were exploited for not more than one successive season. Afterwards they returned to the stage of woodland and other parcels of land were deforested in order to create new fields for agricultural exploitation. This practice is very comparable to the agricultural practices described above and is qualified by the French archaeologists as *agriculture itinérante*. To them, the determinative factor for the shifting nature of the arable fields is to be found in the short life of the farmyard, especially of the farmhouse.

Shifting and swidden cultivation

Above, I referred briefly to slash-and-burn practices. The short-term exploitation of fields as ascribed to the Bronze

Age period has in its description much in common with this practice of slash-and-burn cultivation or shifting cultivation. This concept is well known from anthropology and it (or its consequences) is often taken over in archaeology. Iversen and Troels-Smith were the first archaeologists to introduce this system in archaeology and it has been taken over very often ever since (Iversen 1941).
The essence of a shifting cultivation system is the following. A group or household chooses a plot of land, cuts and burns the vegetation and grows their various crops on the thus created arable field. These practices are known as slash-and-burn agriculture. After one or two years of food production the plot is left to fallow in order to allow the vegetation to recover. The people then shift their attention to another, often adjacent, part of land. Anthropologists speak of shifting cultivation in the case where people, using a particular part of the forest, also settle next to their new arable land, hence shift both land use and settlement. However, today in certain regions (e.g. South and Southeast Asia and the Pacific) many shifting cultivators are forced to settle down in permanent villages, due to mainly political reasons. They still, however, prefer to continue their slash-and-burn practices. Thus, only their plots shift place, but the human settlements do not anymore. In this case anthropologists usually prefer to speak of swidden cultivation (Visser 1998).
We should note that archaeologists use the concept of shifting cultivation when referring to farming communities that lived in their settlements for at least one generation, or 30 years, and at the same time were supposed to use plots of land for agricultural reasons that shifted place every one or two years (Barker 1985). I think it is not correct to describe this system as shifting cultivation, as that particular concept implies — as we saw — the yearly shifting of settlements as well. The concept of itinerant agriculture as used by the French archaeologists, i.e. the system where the arable fields wander through the landscape and the settlements are fixed for at least one generation, would be a useful alternative.
Above, it already became evident, that causalities between the nature of the settlements and the associated agricultural systems are not always very clear in archaeology. Some suggest that the fields had to be wandering because of the short life of the settlements, others believe that the settlements had to wander through the landscape because of the recurring exhaustion of the arable lands.
I would stress that also the alternative term of a long-fallow system that was used by Fokkens (1986) points to another aspect of ephemeral land use. This concept emphasises the fact that plots of land were exploited for one or a few years and were abandoned and left fallow for a long time to regain fertility, without *a priori* characterising the associated settlement system (the different fallow systems are further elaborated upon in chapter 3).

Late Bronze Age and Early Iron Age
A traditional impression is that possibly from the Middle Bronze Age and certainly in the course of the Late Bronze Age a gradual intensification of the agricultural production took place. According to adherents of this idea an increasing demographical pressure would have been at the basis of this development. The necessity to increase the agricultural production would result in a more intensive exploitation of existing soils on the one hand and a new exploitation of marginal grounds on the other (Champion et al. 1984). Not much direct evidence for this point of view is found in the archaeological record.
In Lorraine it is suggested that the Late Bronze Age settlements, although still dispersed, were from this period onwards regularly replaced over shorter distances of several hundreds of metres within a territory of only 30 to 100 hectares. These cyclical replacements would be determined by developments of the agricultural system that the French archaeologists name *agriculture rotative*. Within this system exploitation phases on parts of the territory were alternated by phases of fallow, in which old arables would return to their stage of forestation. There is a relation with general socio-economic developments, for example the development of the notion of land tenure that is at its turn, in analogy to what Champion sketches, can be caused by increased demographical pressure (Blouet et al 1992).
As mentioned above, also in the Dutch Late Bronze Age and Early Iron Age the shifting settlement system was still in existence. In these periods the dispersed, one phase farmyard was exploited for only one generation and afterwards left abandoned. The question to which land use regime this settlement system could be related is hard to answer on the basis of the archaeological evidence alone. It could be the rotative system as described above suggested by the French archaeologists, but also a more intensified system in which the use of the ard and manure had been systematically incorporated.
I will briefly anticipate the following section by citing Fokkens (1986), who indeed emphasises the major change in the ideological and economic significance of arable land because of the systematic use of the plough and of manure in this period. “Through the use of the plough and of manure, investment in the soil increased and this strengthened the bond between the farmer and his land” which might be interpreted in terms of the introduction of private ownership of the means of production (Fokkens 1986, 13).
Roymans and Kortlang (1993), however, describe a relation between habitation and agriculture in the Early Iron Age for the poor sandy soils in North-Brabant that differs from a similar intensive model. According to these authors the infertility of the soil in this region would have necessitated an extensive exploitation. As the farmers did not make use of artificial sources to fertilise their fields, they were forced to

abandon their arables after some years of exploitation and take other parcels in use. After c. 25 years the settlement moved in the direction of the newly exploited parcels of land. This Iron Age model is strongly determined by ecological conditions and evokes reminiscences of the "shifting (or swidden) cultivation" strategy presented above for the Late Neolithic and Early Bronze Age (Roymans/Kortlang 1993; 1999).

Middle and Late Iron Age

The later periods are not part of the period under study. However, I will briefly present the main developments in these later phases, as they have relevance for the further analysis. In the course of the Middle and Late Iron Age aggregations of houses occur for the first time in our regions, as in the whole of Europe. Besides, in this period there is the development to multiple phased houses. These hamlets stayed localised on one spot for longer periods and the farmhouses were rebuilt twice or three times on the same yard (Schinkel 1998; Wesselingh 1993). From the end of the Late Iron Age more solid houses appear, possibly with the objective of a longer use. The shift to a nucleation of houses on one yard and to the enclosed settlement can also be ascribed to this period. It is evident to relate changes in settlement from the Middle Iron Age onward to a new, more fixed system of land use that is combined with a shift towards intensified agriculture. Gerritsen and Roymans interpret this development as follows (and I briefly anticipate the following section). The fixed settlement has taken over the function of the material expression of the claim a local group exerted over the settlement territory. In the Late Bronze Age and the Early Iron Age the criterion to deserve the user rights on parts of the arable fields, had been implied in the presence of ancestors in the communal urnfield. In later periods the communal cemeteries no longer existed and from the Late Iron Age it was especially important to inhabit one of the inherited, fixed farmyards in the territory. With the stronger permanency of individual farmyards, also the bond with the surrounding agricultural land got a more permanent character (Gerritsen in prep.). In this development a more intensive agricultural system would be introduced, for which univocal archaeological (and esp. archaeobotanical) indications are unfortunately still missing.

2.5 Claims on arable land and land tenure, ownership of land

In the discipline of archaeology the subject of access to land or land tenure in the Bronze Age and the Iron Age is only sometimes and only dealt with in passing. Only few authors explicitly address the question as to whether a certain notion of (agricultural) land tenure already existed at such an early stage. In this section I will try to describe how the changes — esp. in the burial customs of societies of the Bronze Age and Iron Age — in our regions could be related to changes in settlement structures and possibly intensifying claims on agrarian land. Indeed, evidence of who owns or gains resources from land (land-tenure) can be reflected in burial on the land or close to it. It is widely adopted in archaeology that burials may assert the rights of the kin of those buried and may, therefore, form ceremonial or symbolic expressions of the social position and of the claims of the burying population (Dark 1995, 99-100). A paper by de Coppet (1985) illustrates very well how in the Melanesian societies the land tenure system linked ancestors, humans and the land. In their myths of origin (cosmogonic myths) the ancestral authority and locality on the surface of land are closely connected. In this system, on a holistic value level, land has authority over people as people are strongly subordinated to the land, that is, to their ancestors who are buried there and to whom they are related. Consequently each man or woman has rightful access to the land located around all funeral sites where one of his or her ancestors has been buried. Similar phenomena must be likewise taken into account for the study of access to land in prehistoric society.

Bronze Age barrows

In section 2.2 (burial customs) it was suggested that the Bronze Age barrows were a medium to exert claims on certain parcels of land or territory. The Bronze Age tumuli were widely spaced over the territory of a local group and are probably burial places of individual family units. They are indicated as "family barrows", also because they have been intensively used for secondary burials of adults as well as children. The majority of archaeologists interpret the choice for a location to erect a barrow in the neighbourhood of a settlement as a claim on arable land by the community, as "the barrow ritual, from the Late Neolithic/Early Bronze Age onwards, emphasises the identity of the dead, through the grave gifts, and through the location in the landscape. The ancestors are not concentrated in a collective tomb anymore; dispersed over the landscape, they claim parts of it for themselves and for their descendants" (Fokkens 1997, 369). Fokkens sees an increased sense of private ownership originated from the added energy investment in the soil and the need to own and raise draught animals. This caused the household units to express the rights on their territory by burying their dead on the land that he or she had worked during lifetime (1986, 16). How and by whom exactly the claim on land was brought about, and how exactly we should interpret a possible claim remains uncertain. This is illustrated by the following quote: "I do not intend to say that in Bronze Age individual farmers had permanent and exclusive rights to exploit particular plots. But I do think that, even more than in the Late Neolithic, there was a sense of having traditional rights to use the land, of belonging to a certain area. This is illustrated by the exact location of the

barrow; this means that the places where the dead are buried are important for the community because they represent claims — ancestral rights — to the use of land" (Fokkens 1999, 4-5, underlining by Fokkens).

Late Bronze Age and Early Iron Age
Again in section 2.2 it was noted that the shift from barrows to urnfields gave rise to a change in land use and claims on land. This claim on (agricultural) land can be understood in different ways. On the level of the local group, the right to land was expressed by burying the ancestors on a communal cemetery: the criterion for gaining a claim or exploitation right to a certain plot of land was having ancestors in the communal urnfield (Gerritsen in prep; Roymans/Kortlang 1999). On a more general level, some see the new ideology as a rather democratic system: "the new system allows practically everyone to be transformed to ancestors. (…) The new ideology emphasises individuality, but at the same time the collective is not forgotten" (Fokkens 1997, 370). There is a general assumption with regard to land use in the urnfield period, that a strong collective ideology existed, with the emphasis on local groups of c. 3 to 6 families who owned a communal arable areal and buried their dead in a monumental cemetery. The cemeteries were often in use for centuries, which points to the essential position ancestors took in the cosmological roots of claims by local groups on their settlement territory (Roymans/Kortlang 1999). The combination of moving farmsteads with a strong emphasis on the collective ideology expressed mainly by the urnfield demonstrates, according to Roymans, that claims on parts of the agricultural land by individual households were restricted to the duration of the exploitation of this part of the arable land. As soon as the exploitation of the fields halted and the fields were laid fallow for long periods of time, the claims of these local groups to these fields expired. The communal claims of local groups expressed in ancestral rights will have been dominant in the urnfield period.
This development can be related to developments in agricultural terms in various ways. The rise of urnfields in the Late Bronze Age could point to a stronger continuity and permanency in land use. The genesis of Celtic field systems with it plots of land demarcated by small banks would coincide with the development of permanent claims on parcels of land that should be interpreted as expressions of a form of long term user rights (Fokkens 1991). Brongers noted however that private ownership and the appearance of parcelling are not necessarily interrelated. In his view only farm ownership or settlement ownership seems to be demonstrated, but just how ownership was decided within the settlement or farm remains obscure to him (Brongers 1976, 70).
Fleming developed a model of prehistoric landed property on the basis of his investigations of the large coaxial field systems, especially to be found in England. He concluded that the construction of the fields and their enclosures, as well as the cultivation on the plots must have been in the hands of large groups of people (Fleming 1985, 1987, 1989a and 1989b). This took place in an egalitarian society where land was owned by the community and was distributed among the members of this community. Individual property was only weakly developed or did not exist at all.

Intensification of agriculture = property of land?
Some authors mention the intensified use of the same parcels of arables, for example in a Celtic field system from the Late Bronze Age and Early Iron Age onward and relate this development to a rise of some sort of property of land. In contrast to this, Roymans and Kortlang supposed that the agrarian system in this period remained an essentially extensive system. According to them substantial parts of the field system were left fallow for long periods, i.e. for consecutive generations (Roymans/Kortlang 1993).
However, it should be noted that confusion is created on the use of the terms intensification and extensification. On the one hand, Roymans/Kortlang (1999) stress literally that for the sandy areas of the MDS region, the Urnfield period is a phase of demographic expansion and agrarian *intensification*, connected with the introduction of the Celtic field system. On the other hand, however, in his description of this intensive agricultural system the opposite impression is given. As Roymans states, "the model of a regular shifting of farmsteads throughout the arable complex of a local community provides leads for the study of native conceptions about claims on land. The bond of individual families with specific plots of land seems to have been very loose, and was probably not inheritable. The emphasis lay entirely on collective ownership and forms of land use; the land, even the arable fields, seem to have been held in common…" (Roymans/Theuws 1999, 13-15). A similar description however suggests that an *extensive* system of Celtic field agriculture is concerned.
Finally, Gerritsen supposed that the fields in the neighbourhood of the inhabited farmsteads were in use for long periods of time, i.e. for one generation, which was one life cycle of the farmhouse. He presumes that the fields were kept fertile and exploitable with the help of a combination of short fallow periods and the use of manure (Gerritsen in prep). Opposite to Roymans, he is strictly introducing an *intensive* agricultural system, but he prefers to employ the term of *extensive* agriculture (see for the univocal definition and use of these terms chapter 3) [4].

Middle and Late Iron Age
The Middle and Late Iron Age, strictly defined, fall outside of the scope of this study. With regard to the argumentation that is developed to demonstrate a possible shift in agriculture, it is

fallow system	period of fallow	agrarian implement	manure	tenure
forest fallow	20-25 years	digging stick	ashes	general tribal right
bush fallow	6-10 years	hoe	ashes	
short fallow	1-3 years	plough	cowdung/domestic refuse	permanent family occupation
annual cropping	some months	plough	cowdung/domestic refuse/ green fertilizers	
multicropping	no fallow	plough	cowdung/domestic refuse/ green fertilizers/compost etc.	development towards landed property

Fig. 2.14 The five evolutionary stages of the Boserupian "Frequency of cropping" model (1965)

interesting to move the time perspective a bit further. The analysis that some authors offer of the developments of claims on land in this period demonstrates an interesting discontinuity with the previous period. From the Middle Iron Age, after the disappearance of the urnfield cemeteries, the focus of the ideological framework of land tenure demonstrates a shift to the farmyards (Gerritsen in prep.). In the Late Iron Age the habit of living in the houses on the farmyards where previous generations (=the ancestors) lived before, is taken up. Exploitation rights of the arable fields were implied by the habitation of one of the yards in the settlement territory, in the sense of an inherited, fixed farmstead (Gerritsen 1999). In addition, the development of clustered, enclosed settlements should be seen in this light. The settlement ditch created and visualised the distinction between the members of the community on the one hand and the non-members, they who had no rights to land, on the other hand.
From a long-time perspective two dichotomies are discerned by Gerritsen. First, the distinction between the wandering settlements in the Bronze Age and the Early Iron Age and the fixed, enclosed settlements of the (Middle and) Late Iron Age. Second, the distinction between the urnfields in the Late Bronze Age and the Early Iron Age and the settlements in the Later Iron Age as means of expression of right to land.

Settlements, burials and the frequency of cropping
In general, there is no controversy about the fact that significant relationships can be found between the development of settlement systems and dynamics, burial customs and agricultural exploitation systems. It is the nature of this relationship and the way it was expressed that varies with the various authors.
In the attempt to identify the nature of these interdependent relationships, the different authors cited have taken virtually diametrically opposed positions. Some archaeologists assume a gradual intensification of agriculture during the period in question, while others believe that extensive forms of agriculture predominated in the Early Iron Age as well. In addition, the causes for change are found in different realms: some explain the changes that took place by pointing at demographic developments, others mention socio-political or ecological factors. However, it is important to stress, that a joint departure point is that an agricultural change is expressed in a shortening, or respectively, a lengthening of the fallow period. In other words, in an increase, respectively, a decrease of the frequency with which crops were cultivated on the same plots.
As much as the various models differ on one or more points, we are still able to establish that they are, without exception, based on or derived from the scheme that was developed by the Danish economist Boserup in 1965 and that is known as the frequency of cropping-model (figure 2.14). Although the Boserupian origin of this model may be unknown to some archaeologists, it has known many followers in archaeology. The contents and implications of this frequency-of-cropping model are seen as virtually irrefutable facts. In the next chapter the role of the Boserupian model in the debate on agricultural intensification is further elaborated. Here I will restrict myself to an outline of the main aspects. Boserup assumed in her developmental scheme a unilineary evolution of agriculture in five stages, from a shifting cultivation-agriculture with periods of fallow up to 25 years, to a multiple cropping-agriculture, with more than one harvest per year from the same field. The successive stages of this gradual model are characterised by their own specific technology (like implements: the digging stick, the hoe, the ard, the plough; and the gradual introduction of various soil fertilisers). Boserup's intensification model also assumes an obvi-

ous relationship between the increase of frequency of cropping (shortening of fallow) and a growing notion of land tenure (the development from communal ownership of land to land tenure and landed property). According to Boserup, population growth would be the causal factor in this agrarian evolution. The scheme is superior in its simplicity and adopts its attractiveness from its easy applicability to archaeology. Thus, when only some elements from the scheme are present in the archaeological record (for example the presence of ard marks), it is quite easy to find the matching stage of agricultural intensification in the scheme. In the next chapter I will argue that the Boserup model offers an oversimplified reproduction of reality.

Do claims on land or access to land imply an ownership of land in prehistory?

The study of access to (arable) land and land tenure fits within the realm of the investigation of agricultural productive systems and the possible changes with regard to that system occurring over the course of time. Changes in the use of agricultural land imply changes in the access to land. Many assumed that a process of increasing frequency of cropping in the course of the Bronze and the Iron Ages was related to an increasing claim to land. But how should we identify and make statements on as abstract a subject as access to and ownership of arable land? When studying the literature dedicated to this subject the mix up of terms to denote land tenure in prehistory is striking: ownership of land, landed property, land tenure, territoriality, control of land, claim on land, access to agricultural land. As Roymans and Theuws very rightly stated "in the research into the changing cultural associations with land, we quickly encounter several fundamental problems" (Roymans/Theuws 1999, 12). This begins already with the unclarity around defining the type of land. We should, primarily, take into account the different ideas and values concerning property and the alienability of land in non-western society. Possibly, to prehistoric people the notion of property was less absolute, less exclusive and less related to the economic value of land. Therefore Roymans and Theuws (1999, 13-15) propose to analyse property and property relations in terms of a series of overlapping claims. For the Bronze Age and Iron Age societies in the study area, we should, according to them, probably imagine such a series of overlapping claims on land. Individual households would have had claims (though not inheritable) on specific plots of land that they cultivated and on which their farmstead stood. In addition, the local community as a whole had a claim on land which, on a supralocal level, was embedded in the territorial claims of (sub-) tribal groups. The ultimate claim, however, lay with the ancestors, according to Roymans and Theuws. Another problem is formed by the fact that the various authors actually refer to different things, when describing claims on land in prehistoric society. This confusion might be connected with the confusion with regard to overlapping terms like arable land, landscape, area, ground, soil, and natural environment etcetera. An example will illustrate this. In a paper by Thomas (1997) a significant correlation is presumed between the development of enclosed settlements in Britain, the intensification of agriculture and the rise of direct control on the private land (as the opposite to land of others). These developments all occurred at the beginning of the first millennium BC. Thomas omits, however, to specify exactly which land he aims at. Is it the agricultural land, the territory, or is he referring to the settlement grounds?

I do not pretend to offer a definition of land tenure in prehistory or how it was brought about. It might even be impossible to answer questions on the origin or nature of land tenure or landed property in this period. The evidence on this matter is too scarce to answer these questions, but some clarity on the nature of the questions we want to answer and on exactly what land we refer to appear to be primary conditions. I do not believe that a growing control over arable land can simply be demonstrated by the rise of enclosures around settlements. And it remains rather unclear to me whether claiming ancestral land by means of barrows and, at a later stage, urnfields implies a strengthening of the bond with agricultural land. Nor has it become clear if we should have individual or communal claims in mind, or overlapping claims. At the least, there is some confusion of terms.

It is of prime importance to be clear about exactly what type of land is concerned here. Archaeological evidence on the association of people with landscape often concerns *use* of land rather than the representations of claims connected with it (Roymans/Theuws 1999, 12). In my study, attention is restricted primarily to the active use of the agricultural land, i.e. the interference of people with the surrounding land, with agricultural purposes. Here also, as described in chapter 1, the objects of our study are considered as the results of human activities. Therefore, and for the sake of the framework of this study, I will explicitly not refer to grassland, forests or heaths nor to settlement grounds or settlement territories. Furthermore, it is important for the purpose of this study that I demonstrate in what way the claim on land, i.e. the appropriation of land was expressed. Below a short description of the term as I use it in this book will be presented. Therefore, I will explore the dichotomy between tenure and territoriality as formulated by Ingold (1986) and taken over by a.o. Barrett (1994). Afterwards, I will outline how, in my opinion, we can develop a perspective of the way in which claims on land were brought about.

Working model

In describing land tenure, Ingold emphasises the opposition between social and material dimensions of the human

existence. He stresses that land tenure, a concept exclusively applicable to agrarian societies, very definitely does not connote the same kind of behaviour as that implied by territoriality, a concept primarily used to describe hunter/gatherer societies (Ingold 1986, 130). The difference in meaning between tenure and territoriality corresponds to the oppositions between social and material dimensions.

Land tenure is a mode of appropriation by which persons exert claims over resources dispersed in space. Territorial behaviour is basically a mode of communication. Tenure engages nature in a system of social relations. Territoriality engages society in a system of natural relations. Territoriality and therewith territorial boundary markers, stimulate the movement through the landscape. They are signposts comprising parts of a system of practical communication rather than social control. Social control in a basically agrarian society, in contrast, requires boundaries, artificial structures that clearly prevent movements through the landscape. The land boundary in a similar society is the result of a concrete appropriation. Land tenure, in brief, has to do with social appropriation: boundaries are there not to indicate where people and resources are, but to keep other people away from the resources.
As a provisional starting point with the aim of attempting to demonstrate appropriation of land the following statements were formulated.
1 The changing of the landscape is an expression of the appropriation of land. In terms of agricultural changes I point to the creation of fields, parcelling or enclosing land. Also, enclosed storage areas can be interpreted in terms of the appropriation of land.
2 This appropriation (i.e. of a parcel of arable land) is justified by prolonged intensive care of the land and of the products it brought forth. This means manuring and ploughing, weeding, harvesting and crop processing: in short all (changes in) agrarian practices and agricultural techniques in relation to the demands of (new) crops.
3 Eventually, we can imagine that the more prolonged, more frequent or more far-reaching these changes have been, the stronger the appropriation was.
In brief, appropriation of land is introduced as a concept to describe the active way people exploit resources, modify them, and exercise control over them.

2.6 State of affairs

Despite the fact that the large-scale archaeological excavations of the last decades have greatly enlarged our knowledge, several aspects of Bronze Age and Early Iron Age society still remain unclear to us.
These gaps in knowledge hinder our present knowledge of agricultural change. We still do not understand, for example, the exact cause, origin and nature of the wandering settlement system, nor of the development of the longhouse. For how long was a settlement in use, before it was left behind, and at which distance did people create their new settlement? Should we regard the longhouse as a widespread phenomenon from the Middle Bronze Age onwards or was it an exceptional phenomenon, and for what reason did people start to keep their cattle indoors? How should we interpret the claims on arable land that were laid by the people who erected the Bronze Age barrows and who developed the urnfields in a later phase? The study of the agricultural system of the people, who inhabited these settlements and buried their dead in the barrows and urnfields, is complicated by the fact that we do not have the answers to these questions.
On the other hand, the program of the present study possibly can throw a new, i.e. archaeobotanical light on these questions and could try to fill the gaps that archaeology could not fill. To answer questions with regard to the changes that agriculture underwent in the course of the Bronze Age and the Early Iron Age, the archaeological record alone clearly does not suffice. Therefore, integration of the archaeological data that we have with archaeobotanical data is a primary condition. A similar integration could bring us closer to answering questions, like, what the nature of the arable fields from the Late Neolithic to Iron Age was, which locations were selected, what sizes these arables had, how long the fields lay fallow. Did an intensification of the agrarian productive process take place, and can we relate this intensification to the introduction of the systematic use of the ard or other changes with regard to agrarian methods or techniques, like manuring? Or did people stick to the system of wandering arable fields, and were these fields extensively cultivated?
The issue of the intensification of agriculture will be presented through a series of *models*. This is necessary, as we noted in the previous chapter that terms like shifting cultivation, swidden cultivation, agricultural intensification, "itinerant agriculture" and "rotative agriculture" are used rather inaccurately. Therefore in the following chapter finally a model of investigation is proposed to study agrarian regimes in the light of intensification.
Further, in the chapters 4-7 I will present the archaeobotanical *evidence*. In that part, the locations and their seed assemblages are presented. The various elements of the agricultural system will be identified. That is: which crops were cultivated, which methods of cultivation were used, what the nature of the arable fields in use was, what the mode of production was and what the underlying strategies were and to what extent the agriculture was fixed to one place?
It will then be possible to conclude whether in the course of the Bronze and Iron Ages actual changes occurred towards an *intensifying* agricultural production. These agricultural changes will be interpreted in terms of the relation between local communities and their agricultural land.