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The subject of this chapter is the growth and development of agriculture in the Iron Age, which in Swedish prehistoric chronology refers to the period between roughly 500 BC and AD 1000. However, many of the decisive moments that were to determine the agriculture typical of the Iron Age had already occurred back in the Bronze Age. We have therefore extended our discussion by some three hundred years to 800 BC. In this ‘long Iron Age’, settlements, fields, meadows, and pastures expanded into land that had previously been used more extensively. The expansion, however, cannot be characterized as simple, even, gradual growth. Instead, periods of expansion, colonization, and deforestation alternated with periods of recession, retreat, and reforestation. New technologies and practices were introduced – the tools, crops, and farming systems that would increase productivity. Moreover, through all the different eras of the Iron Age, agriculture was influenced by shifting socio-political structures and processes that had a profound impact on production, settlement patterns, and the landscape. As a result, agrarian landscapes underwent a series of radical changes. As will be shown, these changes were often as fundamental as the much later, and much better known, land reforms of the eighteenth and nineteenth centuries. Iron Age agriculture was neither primitive nor stagnant.

The emergence of mixed farming

From the southernmost province of Sweden to agriculture’s northern margins, there was a well-documented expansion of agricultural open lands during the first millennium BC. The dramatic opening up of former forests and woodlands in Skåne during the late Bronze Age
clearly represented a decisive step towards the present appearance of the agricultural plains of the south. Cultivated and grazed areas expanded, topsoil erosion increased, and pastures and meadows with semi-natural vegetation came to dominate for the first time. The general expansion of human influence also paved the way for the most rapid increase of floristic diversity in the whole Holocene epoch. The land was transformed into a humanized mosaic of fields, meadows, pastures, and managed woodlands. Simultaneously, in the eighth century BC, people started to cultivate barley, wheat, and oats along the lower reaches of the Ume River on the Baltic coast, at 64° N, which was then the northernmost limit of cultivation. The expansion into this northern area was short-lived, however, for cultivation ceased in about 400 BC, and not until after AD 500 would there again be any agricultural expansion in these areas.¹

Agricultural lands expanded all over Scandinavia, but the character of farming also changed and came to include new elements: cattle byres, hay-meadows, permanent field systems, and iron implements. Scandinavia became part of an agricultural system of mixed farming, which for two millennia was to dominate a wide belt from Ireland in the west across the northern half of Europe.² It was not until the twentieth century, and the advent of artificial fertilizers and fossil fuel traction, that the mutual dependence of the two farming sectors began to dissolve.
This agricultural system owed much of its existence to the environment, with its short vegetation period and temperate climate. However, rather than assuming that it was environmentally determined, we now have the data to interpret the move towards mixed farming as a more complex process. Much of the archaeological and palaeo-ecological research of recent decades has been intended to establish with greater precision when the various elements were introduced.

**Stalling or out-wintering livestock**

The earliest evidence of cattle byres along the Dutch and German North Sea coast dates to 1800–1500 BC. In Denmark, the earliest stalling of cattle has been dated to some centuries later, while in Sweden to the first millennium BC. From Skåne in the south to Uppland in central Sweden, similar long-houses from the first millennium BC have now been found. Such three-aisled long-houses, with their characteristic division between the dwelling unit and one or two rooms with other functions, become increasingly common in the archaeological record of this period. In some cases it has also been possible to use construction details, phosphate mapping, and the distribution of finds and ecofacts to prove that one part of the long-house was indeed used for stalling livestock and storing winter fodder.3

However, the fact that byres have been documented for a given period does not prove that indoor stalling had become the dominant practice in livestock-keeping. In Östergötland, a large number of isolated hearths have been found. None of them has any close connection to settlement sites, burials, or ancient fields. Maria Petersson argues convincingly that in their sheer number they represent nodes in a ‘well organised system of grazing, where the animals were kept outdoors, winter as well as summer’. The dates of these isolated hearths (roughly 1000 BC to 1 BC) are contemporaneous with the opening up of grazing lands documented in pollen diagrams. The dates of similar hearths in Uppland support this evidence of an expansion and intensification of grazing on the outlying lands of permanent settlements. During this period of agricultural expansion, it thus seems that both increased winter stalling and large out-wintered herds were part of the picture. Moreover, the balance between stalling and out-wintering may have varied geographically. Even in the southernmost areas of Sweden, where otherwise there is early evidence of stalled cattle, out-wintering seems to have continued to play a role well
into the first millennium AD. Using the age distribution of slaughtered animals, Stig Welinder has shown that in the second century AD one part of a herd in this area was out-wintered.4

In the Swedish literature, climate deterioration in the first millennium BC has often been advanced as the explanation for the introduction of stalling. This increasingly cold period has also been given the name, taken from the Edda, of the fimbul winter (from the Icelandic fimbulvetr, great winter). Yet the connection to a period of cooling is not as obvious as it would seem. Cattle can withstand cold weather and snow up to a certain depth, and are able to browse bushes and trees. Thus the choice farmers had to make in the past, between out-wintering and stalling, in northern Europe as in other parts of the world, did not simply reflect climatic zones or other environmental factors. There are several reasons, beyond climate, that may explain why stalling was introduced. Stalling, through the closer connection between humans and animals, permits more intensive milk production, including a more productive use of fodder-producing areas. Furthermore, the connection between stalling and the use of cattle manure on intensively cultivated infields is one part of a more general intensification of agriculture. As has been shown for many other parts of the world, the increased role of private property and the security of the herd can be seen as factors that contributed to the spread of cattle byres during this period. While climate certainly played a role (especially in wet and windy areas) there is thus good reason to regard the introduction of winter stalling not as an environmentally driven adaptation, but rather as a new technological and social complex that spread from central parts of Europe to Scandinavia in the Bronze Age and early Iron Age.5

The first hay-meadows?

Haymaking has long played a central role in the farming systems in Sweden, and hay-meadows of different types are a characteristic feature of the historical landscape. It is not surprising, then, that great efforts have been made to document the origins of mown hay-meadows. Different evidence has been adduced to date the introduction of haymaking: the indirect evidence of the implements used (sickles or scythes); the existence of stone-wall enclosures around wetlands; and palaeo-ecological evidence. For the first millennium BC, the strongest evidence comes from palaeo-ecology.
Many pollen diagrams for southern and central Scandinavia show that during the first millennium BC alders (Alnus) decreased while a variety of key plants indicative of managed wetlands increased. The most probable explanation for this shift in pollen frequencies is that alder carrs were cleared for grazing or mowing, and in the process were transformed into sedge fens. From this we can infer that the first expansion of hay-meadows on wetlands began in 800 BC in Skåne. Lagerås has shown how a fen in northern Skåne was cleared in the period 700 BC to 400 BC, and further supports his contention that this managed wetland was a hay-meadow (rather than just a grazing area) with an analysis of the ecological characteristics of the vegetation that grew there.\textsuperscript{6}

A close examination of the vegetation characteristics has shown that in Skåne there were mown hay-meadows on dry ground from at least 200 BC. The palaeo-ecological analysis indicates ‘rich, fresh meadows, most probably mowed in early summer, and grazed during late summer and autumn’. Hay-meadows on fens probably came earlier than on dry ground, possibly because sedge fens were easier to harvest with a sickle, while the thinner growth of grasses and herbs on better-drained ground became easier to harvest only with the arrival of scythes.\textsuperscript{7}

\textit{Permanent field systems}

During the first millennium BC, farmers in Scandinavia started to invest more in permanent fields. Stones were cleared from the land and collected into clearance cairns, while cultivation led to the formation of lynchets and banks. It is from the patterns of field boundaries and the distribution of clearance cairns that we can discern, on a broader scale, what the general appearance of cultivated fields in different parts of Sweden may have been. On the Baltic island of Gotland and in Skåne the field systems were of the same character as in continental northern Europe, and consisted of extensive areas of ‘Celtic fields’ – a term for small square or rectangular fields bounded by sandy or earthen banks.\textsuperscript{8} Investigations in some of the many extensive field systems of this type on Gotland show that they emerged in the eighth century BC, and were in use until the second century AD. While Celtic fields from this period are common in Denmark, they are less well documented in nearby Skåne, but there is reason to believe that they were widespread there during the first millennium BC. The fields were tilled with wooden ards, or
scratch-ploughs, which since about 800 BC had been equipped with detachable wooden ard-shares to cut through the topsoil. Archaeological excavations of fields in different parts of Sweden have documented the characteristic criss-cross pattern associated with ard tillage; indeed, the fact that the fields were cross-ploughed is one reason why so many fields from this period are square or rectangular in shape.9

However, the clearest evidence of arable fields in the first millennium BC comes from the prevalence of large clearance-cairn fields, especially in the interior of southern Sweden. The remnants of these field systems cover substantial parts of the present forests, extending well beyond what would later become infields and meadows. Many of them originated in the late Bronze Age, from the ninth to the sixth centuries BC. There are few visible boundaries between separate plots in this type of ancient field. There seems to have been some short- or long-term field rotation, which together with the palynological evidence bears witness to a landscape that was a mosaic of small cultivated fields alternating with secondary woodland.10

Crops

The manifest changes in the farming system in the first millennium BC were that the rearing of livestock and the cultivation of fields became more closely integrated. But the composition of the crops grown also changed. The main crops until the late Bronze Age had been millet (*Panicum miliaceum*), emmer wheat (*Triticum dicoccum*), einkorn (*T. monococcum*), spelt (*T. spelta*), and nude barley (*Hordeum vulgare* var. *nudum*). However, in the course of the first millennium BC, hulled barley (*H. vulgare* var. *vulgare*) had an ever-increasing role, and from then on came to dominate amongst the grain crops in Sweden for more than two millennia. There is no simple explanation for this change. The cooler climate could be a reason why the cultivation of millet and emmer wheat decreased, but that can hardly explain the decline of spelt, since in the same period the cultivation of spelt increased in the British Isles as a substitute for the climatically more sensitive emmer. Another explanation may be that the older grains had more fragile ears, so that it was simpler to harvest them ear by ear. Better sickles, especially from 100 BC on, made a more efficient harvest possible, but might at the same time have favoured the cultivation of less fragile grains: new harvesting techniques may thus have influenced the choice
of crops. The spread of hulled barley in southern Sweden is also in clear contrast to recent results from south-western Denmark, where for the same period hulled barley took a more modest role. It has also been proposed that the preference for hulled barley in Swedish areas was connected to changed cultural preferences in cooking and brewing.11

The first millennium BC can thus be characterized as a period of agricultural expansion and change. It is difficult to isolate a single element of technological or social change that might explain these developments. While a cooler climate is certainly part of the picture, it should not be thought the main explanatory factor. Rather, we should see the change as arising from the introduction of a technological complex of cattle stalling, hay-meadows, manuring, increased tillage, and the establishment of permanent, stone-cleared fields. The increased tillage and stone-clearing may have been motivated by the need to mix manure into the soil.

Intensification and technological change, AD 200–600

In the early centuries of the Christian era, the evidence of farming practices, tools, landscapes, and social organization becomes much clearer than for the preceding centuries. Written evidence also provides us with our first opportunity to gain some sense of the social context in which this took place. From classical writers we start to get an idea of the different peoples and lands in Scandinavia, even if the information is brittle and contradictory. Scandinavia at this point was divided into a series of small lands or petty kingdoms, often with roughly the same boundaries as the landskap (provinces) known later in medieval times. The writings of Jordanes are especially valuable, for he provides us with the names of regions that can be located – and confirmed – by the distribution of ancient monuments. Centres of power are evident from their monumental mounds, and a detailed picture begins to emerge of the large and wealthy settlements that formed central places for these hierarchies.12

Beginning shortly before the Christian era, and well evidenced for in the second and third centuries AD, there were a series of changes in technology and farming practices. The richness of the archaeological material shows that these changes were partly the result of settlements expanding, so of course it is possible that some of the innovations were developed earlier, but only later surface in the archaeological record. The sources indicate a technical change in almost all aspects of farming,
from the harvest to the processing of produce. It is only in tillage that there seem to have been no changes from the previous period, while it was now the only newcomers amongst domesticated animals in the entire Iron Age appeared: hens, geese, and cats.

During the first millennium BC, iron sickles had gradually replaced bronze sickles. From the available evidence, the huge increase in the use of iron implements for harvesting and haymaking began in Sweden around 200 BC. For the period 200 BC to AD 200, over 260 iron sickles and leaf-knives (used to gather leaves for fodder) have been found in Sweden, mainly as grave-goods. They show great variety of form, indicating that this expansion was based on a long tradition of smithing. Some forms of sickle were well suited to coppicing for leaf-fodder, while others would have been better used to collect herbs or harvest cereals by cutting just under the ears. Whatever their specific purpose, their small size may indicate that harvesting was mainly carried out by women and children.\(^{13}\)

Most of the sickles have been found in simple cremation graves. Around AD 200 there was a sudden change, and simple cremation graves with implements petered out. The harvesting implements that previously had almost exclusively been placed in graves of a distinctly female character or in graves with very simple grave-goods now began to appear in male graves with weapons. The symbolic aspect of depositing harvesting implements thus shifted from the distinctly female sphere to one that was generally male. In this new male sphere, new types of implement appeared. The previous array of different forms that reflected local traditions was replaced by a smaller selection of harvesting implements, all related to Roman or Celtic types, and noticeably longer than the previous sickles. It was also at this time a specialized implement for hay collection was developed – the short scythe – which made for a much more efficient hay harvest than the previous sickles. The evidence of the increased importance of haymaking is further underlined by the first finds of hay-rakes, dating from the third to fourth centuries AD. This technological development completes the picture of the crucial role played by stall-feeding, which by now was well established across the whole of Scandinavia.
Rotary querns and bread

Similarly, when it comes to the processing of agricultural produce, important technological changes occurred in the third and fourth centuries AD. The simple saddle quern had long been the only milling implement, and was still in use well into the Iron Age. But from 100 BC on, the first rotary hand-querns came into use in Scandinavia, and by the third and fourth centuries AD we know them from settlement sites, burials, and hill-forts in Uppland, Östergötland, and Bohuslän. It is significant that the first finds of rotary hand-querns and bread occur at the same time and in the same type of elite social environment.

Hearths specially designed for baking bread, usually built of stone and covered with clay, have been found in long-houses in Norrland from AD 100–400. Specialized baking ovens have also been found from the period AD 200–500. The Tune stone, an important rune-stone found in the Norwegian province of Østfold, has a runic inscription from around AD 400 that explicitly mentions bread:

Ek wiwaR after woduride witahalaiban worahto r(unorR)

The translation is: ‘I Wiwar, in memory of Woduridar, the lord (‘bread-provider’), made the runes’. The word witandah(a)laiban, the bread-provider, is interpreted as a noble title and a cognate of the Old English lord. The word for bread is halaiban (Sw. lev, Eng. loaf). This was the thin, unleavened bread cooked on special baking stones, of which there are several finds dating from the Swedish Iron Age.

Amongst the elite sites, which seem to have played a central role in the cults of the local district, is the settlement at Helgö in Uppland. Remnants of thirty rather thin loaves of bread were found there in layers dating to the third and fourth centuries AD. What makes the Helgö site spectacular are the numerous finds of rotary querns from the same period. Rotary querns, pieces of rotary querns, and loaves of bread were all deposited, apparently repeatedly, on a stone ledge close to the settlement. If nothing else, the ritual function of the site now seems well established. In Old Norse cosmology there was a cosmic quern that controlled time, the seasons, and fertility. Torun Zachrisson points out that for the ‘metaphor of the cosmic quern to be appreciated, rotary querns must have been known and used in everyday life’, and this was apparently the case at the Uppåkra site in Skåne, the elite, fortified manors in Östergötland, and at Helgö in Uppland. Both the bread
and the rotary querns seem to have been part of the Roman cultural baggage introduced in Sweden during this period.\textsuperscript{14}

\textit{Wool and textiles}

Apart from the clothing found on the bog corpses that have been recovered (especially in Denmark), only a few complete garments have survived from the Scandinavian Iron Age. However, the tiny pieces of cloth that have been preserved in contact with corroding metal, especially in graves, as well as the evidence of textile-working tools and animal breeding, can tell us much about changes in textile production. In the second century AD, there were the first signs of sheep being selectively bred for both better wool and specific shades. From then on, white-wool sheep became increasingly common. The same period saw an important change in how people dressed. Leather was no longer used as much as before, and leather clothing vanished almost completely, as is evident from the finds from bogs and graves alike, where leather cloaks gave way to long mantles of woven wool fabric. Leather and fur were no longer the ordinary necessities of life; they became luxury goods.

The second and third centuries AD also saw a break with the past in terms of textile production, as in so many other areas of life. Sheep were bred to improve the quality of their fleeces and there are also the earliest indications that the wool was dyed. There are traces of a variety of dyes in surviving examples of cloth: vegetable dyes such as woad for blue, madder for red, along with lichen purple and insect cochineal, both producing shades of red. The first definite signs that the Scandinavians had begun to use linen cloth occur around AD 200, although based on the archaeological remains it seems as if linen clothing did not come into widespread use until after AD 600. It is possible that linen was more common in earlier periods than first appears, but since it does not survive as well as wool it may be considerably under-represented in the archaeological record.

There is very little evidence of tools for spinning or weaving before AD 100, probably for the simple reason that distaffs were made from organic material such as wood or bone, and that fabric was generally woven on round looms without the loomweights that were to be such important evidence for later periods. From about AD 100 there was a rapid change across Scandinavia. In both settlements and graves there
are finds of spindle-whorls of stone, fired clay, or bronze, which, along with loomweights of fired clay or soapstone, show that warp-weighted looms (or vertical-shaft looms) had become far more common. Cloth with round-loom selvages became ever more rare, matched by an increase in the amount of cloth with the warp-weighted loom’s characteristic selvages. While the two-shaft round loom was effective for plain-weave cloths, the warp-weighted loom, with multiple shafts or heddles, was much faster to use; something that was necessary for twill weaves.

Shears were another innovation that began to appear as grave-goods around AD 100. With their help, sheep could be clipped to produce large, whole fleeces. Yet right up to the end of the Iron Age, plucking remained a very common method, especially for the long-staple wool needed for fine worsted yarns. It was also at this point that people began to make clothes from pieces clipped or cut out from the long, full loom widths of cloth woven on warp-weighted looms. Indeed, the improvement of sheep breeds and the changes to looms and weaving techniques, plus the introduction of shears, at the same time as leather clothing faded out – all are indications are that wool-growing and making clothes had taken on a far greater significance than before.¹⁵

**Changes in the landscape**

These technical changes were coterminous with rapid changes in the agrarian landscape. Judging by the palaeo-ecological evidence, the first five centuries AD were in many regions characterized by the opening up of large areas to grazing and by an increase in grain cultivation. Field systems and settlement remains in some areas permit a more detailed understanding of how the different types of land use acquired a fixed spatial organization.

On the Baltic islands and in some of the central districts of the Mälaren valley and what is now the province of Östergötland, the extensive networks of collapsed stone walls document the division of the land into enclosed infields and outlying common grazings. On the islands of Gotland and Öland, and in the central parts of the provinces of Uppland and Östergötland, these walls are still to be found in the modern pastures and woodlands. On Gotland, stone-walled enclosures of this type directly overlie the ‘Celtic fields’, and have been interpreted as representing an intensification of farming. A more itinerant form of farming was replaced by the concentration of cultivation in small,
agriculture in sweden 800 bc–ad 1000

intensively manured infields. On both Öland and Gotland this development ran parallel with the increased importance of sheep, and from the archaeo-zoological evidence we can see a clear trend towards specialized sheep farming on all the Baltic islands. The large proportion of sheep and goat bones in the material from Gotland and Öland from this period is in sharp contrast to the general northern European trend.

On Öland and in Uppland and Östergötland the remains bear witness to a spatial organization that was very different from the later territorial organization of the historical period. Stone walls were frequently used to enclose small patches of arable land as well as large areas suitable for haymaking. Meanwhile the pattern of cattle drove-ways gives some indication of the social organization of grazing, for they were generally shared by a group of single farms, while in some places the convergence of several drove-ways on one large common grazing area would seem to indicate that there was also an overarching structure.

Such agrarian landscapes are found in a close functional relationship to houses and farmsteads dated to the first five centuries AD. In a small number of cases, the direct stratigraphical dating of these structures indicates that the basic structure of dry-stone walls enclosing infields and meadows was in place by that time. The expansion of this new system of grazing organization, with its focus on the farmsteads, came as a sequel to the abandonment of many of the hearths that are thought to indicate out-wintering herds. This must be interpreted as an intensification of livestock farming. Similar large systems of enclosures may also have existed in other areas, but as wooden fences rather than stone walls. The wooden fences documented from this period are of two types: a type of wattle fence, which can often be found close to settlements; and slanstaket, a simple kind of post-and-rail fence, which because of the long gaps between poles is much more difficult to identify in archaeological excavations. The latter, which is far less demanding in labour, would have lent itself to large systems of enclosures. Meanwhile, in other areas of Sweden this expansion took other forms, so that western Sweden, for example, lacks clear evidence of an enclosure system of the infield and meadows type. Instead, we find a pattern of strip fields, which may have started to emerge in the first centuries AD, as a few dated fields in Västergötland show, while on the west coast in Halland these types of field generally do not appear until the beginning of the second millennium.
In the interior of southern Sweden, cultivation and stone-clearing continued in the large clearance-cairn fields, many of which had initially been cleared long before in the first millennium BC. In these areas no permanent boundaries were developed between different types of land use. It has been suggested that this might reflect a form of ley farming, by which some areas were used as arable, others as hay-meadows, and the remainder for grazing. While earlier interpretations of these field systems stressed that they were relicts of the last phase of hand-hoeing in a system of long-term fallow, there is now growing evidence that stone-clearing was instead driven by a system based on manuring with cattle manure and intensive tillage with wooden ards.22

Sedentary farming spread successively northwards from central Sweden. In Hälsingland there are traces of sedentary agriculture from 400 BC, in Medelpad from AD 1–100, and in Ångermanland from AD 300–400. In Medelpad and Hälsingland in particular there are abandoned farm sites that make it possible to reconstruct the Iron Age farming landscape: some 160 abandoned farms bear witness to a
settlement expansion that in character and chronology can be compared with what happened much further south in the province of Östergötland and on the islands of Gotland and Öland. Today we can find remains of permanent settlements and their associated grave monuments from that period even in peripheral and remote areas of Hälsingland, which, after their abandonment in the mid first millennium, were not permanently settled again until the medieval period or even later. The agrarian landscape in these provinces of southern Norrland was characterized by single farms, with a small cultivated area close to the farmyards, as can be seen from clearance cairns and other signs of cultivation, such as positive and negative lynchets. The small fields, perhaps amounting to little more than a hectare per farm, were intensively manured, while hay was mainly collected from natural wetlands.23

**Social organization**

From farm and village up to local and regional centres of power, and upwards to the level of the various small lands or kingdoms, it is evident that both agricultural intensification and technological development took place within the framework of a socially stratified society. In the rich material of settlement remains from the period AD 200–600, it is possible to discern a social hierarchy of settlements that spanned at least four broad classes.

(i) Small households, perhaps made up of unfree or dependent persons. The archaeological evidence for such settlements is not overwhelming, but it does exist. Knut Odner’s analysis of a settlement under a rock shelter in Norway is the model for understanding such settlements. The most clear-cut examples in present-day Sweden are small settlements on the outlying grazing on Öland’s thinly vegetated limestone pavement, which have often been interpreted as the homes of minor herders, although indications of similar settlements are now regularly found in larger excavations.

(ii) Medium-sized farms. Probably the largest category. With some 10–12 stalled cattle, they were far larger than the households of group (i). They are often grouped in a village-like structure together with one large farm of type (iii).

(iii) Farmsteads that had long-houses with byres for 18–20 stalled cattle. They can be seen in the archaeological material with a distinctly larger number of houses, and frequently with a ceremonial hall. They would have
been able to house a large number of people, possibly including slaves or other types of dependant labourer. Some of these settlements were fortified manors surrounded by walls of stone or earth, possibly with palisades.

(iv) ‘Chieftain’ farms, which in their finds of hoards, gold, and imported goods differ from other settlements. They also often have finds that indicate that a variety of artisanal products were made there. Uppåkra in Skåne, Slöinge in Halland, and Helgö in Uppland are examples of such central places. To date no very large byres have been found in such settlements; an indication that they did not have their own large-scale agricultural production, but instead were dependent on underlying farms and on exchange.

This clear social division is most evident towards the end of the expansion period, in the fifth and sixth centuries AD. The fortified manors and farms of type (iii) may have formed the centres of local estates, while the settlements of type (iv) were centres for cults, exchange, and military organization, serving a larger region. The extremely rich, central settlements often emerged towards the end of this expansion period, and, in contrast to many of the smaller farms, went on to survive the decline in the fifth to sixth centuries, thus displaying settlement continuity throughout the late Iron Age.24

Sixth-century crisis and restructuring

In the fifth and sixth centuries AD there are many signs of radical changes to settlements and landscapes. Some 1,800 house-foundations on Gotland and 1,500 on Öland, clearly visible above ground, bear witness to the extent of the abandonment. Although the evidence is not as clear (far fewer house remains are visible above ground), the same seems to have occurred at settlements with stone-walled enclosures in Östergötland and Uppland. In the 1950s the evidence was taken by Mårten Stenberger to mean ‘an almost universal end to occupation’. Based on far more detailed investigations of the remains of the farmed landscape, Dan Carlsson later argued that there was a much stronger degree of continuity at the settlements, and that the apparent discontinuity could partly be explained by a change in building techniques.25 Yet even if the element of continuity was stronger than was assumed in the 1950s, the remnants of several single farmsteads bear witness to a decline in the number of settlements, or at least a concentration of settlements. Certainly, a definite lessening of grazing pressure can be seen in the pollen diagrams. Yet
it is not possible to conclude that all areas were hit equally: it is in the coastal provinces in the east, from Blekinge in the south to Medelpad in the north, that the signs of decline are most evident. In the western part of Sweden there are fewer signs of a decline in grazing pressure. Moreover, there are clear regional differences within the eastern zone, where in the midst of the general decline there are indications of an expansion of human influence on the vegetation in two areas: central Uppland and the province of Ångermanland. In Uppland this expansion is directly connected to the growth of a new centre of power at Old Uppsala. The expansion in Ångermanland represents a shift northwards from the previously intensively settled areas in the adjacent provinces of Medelpad and Hälsingland. Developments in the fifth and sixth centuries AD thus cannot simply be seen as a crisis that struck all parts of the country with the same force, nor yet as a general restructuring of settlements and farming systems.

Instead, to understand the decline we must also have some idea of the forces that created the preceding expansion. The early Iron Age political and economic organization must have had a strong capacity to create economic growth and settlement expansion. The abundant and rich archaeological material from the first five centuries AD on the islands of Öland and Gotland, in eastern central Sweden, and along the southern part of the Norrland coast must be viewed in the light of the intensive exploitation of the heartlands of various petty kingdoms. This expansive period is reflected in both the frequency of archaeological finds and the pollen diagrams. The settlement intensification and the increased investments in the land in the form of enclosure systems meant that several earlier innovations – cattle byres, hay-meadows, and manured fields – were reordered in a new spatial pattern; a pattern motivated by the demands of the specialized rearing of cattle and sheep. The enclosures and meadows bear witness to an intensively exploited landscape – possibly even exploited beyond the bounds of the sustainable. Unsurprisingly, it is in these central areas that the signs of change have been best preserved in the landscape. These areas – on the outer fringes of Roman influence – were probably drawn into international exchange systems, and part of their agrarian expansion may have been connected to the surplus production of wool and hides. The development of the agrarian landscape in the Swedish area cannot be seen in isolation from the broader political and economic changes in northern Europe.

It was in those areas that had previously seen the greatest expansion
and had become centres of political and economic development that the decline was most sharp: Öland, Gotland, Östergötland, and Hälsingland. The most probable explanation for the symptoms of crisis and regional restructuring in the middle of the first millennium AD is that they represent shifts in the balance of power within the Scandinavian area that in turn influenced surplus production and settlement density.

Late Iron Age expansion, AD 700–1000

For the late Iron Age (AD 550–1000) the field evidence from farming landscapes is much less clear than in the periods that preceded the crisis and restructuring of the sixth century AD. The relation between arable and pasture remained much the same, and there were no evident technological changes connected with the ensuing restructuring. It is only with the onset of the Viking Age settlement expansion that we can document any significant changes, and it is therefore not until this expansion itself turned into a decline during the late medieval agrarian crisis that abandoned fields and settlements can again be used to reconstruct a farming landscape. However, the comparative paucity of field evidence for the late Iron Age can in some respects be used as a key to understanding the development of the agrarian landscape.

First, late Iron Age cultivation did not cover the same large areas as before. Cultivation and settlement became more sedentary and concentrated, and changes in settlement location and fields became less common. Second, the sheer abundance of the evidence from the earlier periods reflects the fact that house foundations (Öland and Gotland) and enclosures (Öland, Gotland, Östergötland, and Uppland) were constructed in stone. During the late Iron Age there were still stone walls erected, but better axes meant that both houses and fences could largely be constructed in wood. Third, the late Iron Age did not witness sweeping changes similar to those of the first centuries of the Christian era, and it was not until the early medieval period (which corresponds to the European High Middle Ages) that there was a radical reorganization of agriculture based on new field systems adjusted to two-course or three-course rotations.

However, in some parts of Sweden – Skåne, the interior of southern Sweden, and Uppland and Östergötland – it is possible to draw some conclusions on the development of the agrarian landscape in the late Iron Age.
Changes in the landscape

In the southernmost province of Skåne a clear period of change is documented from the eighth century AD. Skåne, unlike much of the rest of Sweden, was by then already a village landscape, and the villages of the late Iron Age were often located close to or on the same sites as the later medieval villages. The common grazings became much more open, to the point of being almost treeless. No large woodlands remained, and the last few alder carrs had been turned into hay-meadows. At the same time, rye cultivation increased. Detailed palaeo-ecological analyses show that rye was sown as an autumn crop, suggesting that the three-course rotation known in the medieval period may already have been established: autumn rye–barley–fallow or barley–autumn rye–fallow.26

In the late Iron Age the hitherto extensively cultivated clearance-cairn fields in the southern Swedish uplands successively fell out of use. Fewer new cairns were established, and in some areas heather invaded the previously open mosaic of woodlands, grassland, and arable fields. Change was not uniform, for in some areas the clearance-cairn fields were abandoned as early as the third century AD; in others they were worked until the eighth century AD, while some continued in
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use well into the medieval period. The broad trend is mirrored in the distribution of burial monuments, which indicates that, with time, settlements and cultivation were concentrated in fewer areas, with better soils.

In Uppland and Östergötland it is possible to trace a radical change in the spatial organization of farm boundaries by comparing the stone-
walled enclosures (c. AD 400) and the farm territories of the late Iron Age (c. AD 700). In the first period, large systems of enclosures and cattle drove-ways connected several farms in a village-like pattern. These extensive stone-walled enclosures often covered land that later would be held by several different farms and hamlets. Some time during the late Iron Age – probably at least by AD 700 – distinctive new forms of burials monuments appeared. The mound-like stone settings of the late Iron Age are clearly distinguishable from the earlier, lower monuments. The spatial pattern of the cemeteries also changed. During the early Iron Age there was of a mixture of dispersed grave monuments and a few very large cemeteries with low stone settings of different kinds. During the late Iron Age, a pattern of several small cemeteries with the characteristic grave forms emerges. In some cases these new cemeteries were sited on abandoned drove-ways from the older system, indicating a clear break with the old pattern of land use. Generally, the late Iron Age cemeteries also often have a distinctive spatial connection to the farm, hamlet, and village lands documented in the earliest cadastral maps dating from the seventeenth century. These are the named farms we find in the medieval records. The previously large enclosure systems were thus replaced by the historical, territorial structure of farms and hamlets, each with their own lands. This indicates a radical shift in the way land was held, and can probably be connected to increasingly centralized power over land and landholding. The changes in the agrarian landscape in this period are thus more related to new social structures than to basic changes in farming practices and land use.27

Expansion of cultivation

The two maps (Fig. 2.5) show the distribution of cereal cultivation in the Roman Iron Age (AD 1–400) and the Viking period (AD 800–1000), based on the pollen record. If the first map is compared with the distribution of settlement and agriculture at the end of the Bronze Age (500 BC), it will be seen that the growth in the first four centuries AD did not in fact lead to an expansion of agriculture as such. The early Iron Age development thus had the character of an intensification of cultivation and settlement in areas that had been used more extensively during earlier periods. This was particularly the case in the southern and central wooded areas of Sweden, while it was mainly along the northern coast that agriculture really expanded in this period.
During the late Iron Age, by contrast, the area where agriculture was practised expanded much further north; in fact, the whole area where barley could be cultivated without too much risk was taken into use during this expansion. Part of the expansion, especially in the southern part of Norrland, was closely linked to the increase in iron production. In particular, the growth of iron production in the province of Dalarna bears witness to the increased regional division of labour during the late Iron Age that ultimately formed the basis for the new centre of power in Uppland.

*Late Iron Age crops and livestock*

Hulled barley was still the dominant crop in all parts of Sweden in the late Iron Age, but, in contrast to the early Iron Age, new regional specializations started to appear. It was at this time that there were the first signs of a shift towards the regional distribution of crops similar to that known from later, historical periods. In southernmost Sweden the cultivation of rye increased, probably in connection with changes in dietary preference for leavened rye bread, but also perhaps because an autumn-sown crop reduced the demand for labour by moving part of
Agriculture in Sweden 800 BC–AD 1000

the hectic period of tillage and sowing from the spring to the autumn. In Halland in south-west Sweden, the archaeo-botanical evidence from the late Iron Age shows an unmistakable increase in the cultivation of oats, which, along with the use of oats in bread, is also well documented in the region in later, historical periods. In the Mälaren valley in eastern central Sweden, barley dominated, but wheat retained a special role throughout the first millennium. In northern Sweden barley dominated throughout the first millennium, as it continued to do until modern times.

In northern and central Europe the eighth century AD saw the beginning of a general change in the livestock economy. Until then cattle had clearly dominated, with the keeping of sheep and pigs little more than a sideline. From now on pig-keeping took an ever-more important role, and their bones predominate in the archaeological record. This partly reflects the dawning of urbanization, but also fundamental changes in agriculture and landscape, for with larger arable acreages and the introduction of crop rotations and regular two- and three-course systems there was less and less grazing available. While pig-keeping had once characterized the deciduous woodlands, they now became important domestic animals raised on the fully cultivated plains. The region that is now Sweden did not match this general development, yet it is still possible to see a greater role played by the consumption of pork. The development in southernmost Sweden was largely in line with the rest of Europe, albeit on a smaller scale. In the rest of Sweden, the high

![Figure 2.6 The distribution of bone fragments at five different archaeological sites from the Viking Age. Lignåre and Pollista were rural settlements, Granby-Hyppinge and Fornsigtuna elite rural settlements, and Sigtuna an early urban settlement.](chart.png)
consumption of pork has been documented mainly at a number of elite sites. This is clearly illustrated by a comparison of five different Viking Age sites in Uppland (Fig. 2.6). Fornsigtuna and Granby Hyppinge were elite rural settlements, while Sigtuna was an urban settlement.

**Iron tools and increased labour productivity**

The later Iron Age (AD 600–1000) is characterized by a sharp increase in the use of iron for agricultural implements. While iron ard-shares first came into use around 700 BC in Europe, there are no equivalent Scandinavian finds: the first iron ard-share found in Sweden came from the settlement at Vallhagar on Gotland, and has been dated to the fifth or sixth century AD. It is almost contemporaneous with another find from the fortified settlement at Darsgärde. In spite of the small number of finds in Sweden, we can document three different types of small ard-share in the later Iron Age: short and broad (Vallhagar); long and narrow (Darsgärde); and winged (Skåne). From the late Iron Age there are two finds of ard bodies, of which one shows clear signs of having been built to carry an iron ard-share. During the late Iron Age ard-shares were seldom longer than 10 cm. In the medieval and early modern periods ard-shares could be up to 30 cm long.

During the late Iron Age a longer scythe was also introduced. Settlement finds and a few grave finds from Sweden, along with hundreds of grave finds from Norway, give a clear picture of the development of harvesting implements during the latter part of the Iron Age (AD 500–1000). Along with a large number of sickles, there are also finds of short-scythes longer than 30 cm. The long-scythe (up to 50 cm) is represented in Sweden only with a few finds dated to before AD 1000, but in Norway long-scythes occur from the eighth century, and there is good reason to believe they were common in Sweden also.

In an experiment in the 1930s, Axel Steensberg compared flint and bronze implements of different kinds, but all of much the same size (17 cm), with a 30 cm short-scythe from the Roman Iron Age (AD 1–400) and a 50 cm long-scythe from the Viking Age. This experiment showed that cereal harvesting and haymaking was much more efficient in the late Iron Age than it had been in earlier periods. Nevertheless, as can be seen in Fig. 2.7, the length of the implement may be more important than the material, be it flint, bronze, or iron. The earliest iron sickles had much the same capacity as the bronze sickles, harvesting some 400 m²
a day. The first real short-scythes harvested almost twice the area in the same time. With a late Iron Age long-scythe, it was possible to harvest four times the area as with a flint sickle of the Stone or Bronze Age type. There was thus a close link between the increased role of specialized iron production and productivity in farming.

During the expansive period of the late Iron Age we can also see a change in building techniques. The long tradition of long-houses – with cattle and humans dwelling in the same building – waned. People began to build smaller houses in which the walls carried the full weight of the roof. These new, smaller houses were built with a variety of methods, including timber-framing with plank walls, wattle-and-daub (as before), and jointed logs; what they all shared was their relatively small size. These departures from the Iron Age long-house tradition meant that stalling and other functions were rehoused in smaller buildings separate from the dwelling-house. In other words, the end of the Iron Age saw a transition from multi-function houses to numerous single-function constructions. This change, which started in the eighth century, can be seen as a response to two new issues. It reflects an adjustment to smaller

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**Figure 2.7** The relationship between blade length and harvested area per day’s work for different types of prehistoric harvesting implement. A – flint sickle without handle; B – crescent-shaped sickle in flint or bronze with a short handle; C – bronze knob-sickle; D – iron short-scythe; E – iron long-scythe (based on data in Steensberg 1943).
households, each with fewer cattle – the number of stalled cattle per household clearly dropped in the late Iron Age – and is also related to advances in wood technology. With the advent of specialized carpentry axes the craft of carpentry became more efficient.

The social and economic context

It was once thought that Scandinavian societies in the late Iron Age were centred on free and equal landowning farmers, whose land rights were based on inheritance. This was contrasted to much of continental Europe, where a more feudal system was already in place. In recent years this view has been much debated, especially in Norway, and it is now generally accepted that different forms of landholding existed side by side, and that an informal type of tenancy was developed before it became formalized in the medieval period.28

In earlier research it was also argued that Scandinavia was a clan-based society, and that land was held by kinship groups rather than by individual lords. It is now understood that the runic inscriptions from the Viking Age depict a kinship system that was not based on patrilineal clans, and instead displays all the signs of bilateral kinship. Men raised rune-stones to their brothers-in-law, their stepsons, and their fathers-in-law. Women could inherit land and pass it on to their descendants. The late Viking Age runic inscriptions not only tell us about the people in whose memory they were raised, but also about farms and landed property. The rune-stone at Ågersta in Uppland serves as a boundary marker between two properties, and reads:

Vidhugse had this stone raised in memory of Särev, his noble father. He lived at Ågersta. Here shall stand the stone between the farms. Let that dræng read who rune-wise is those the runes that Balle carved.

The rune-stones are monuments raised to the dead, but they also functioned as title deeds. On the rune-stone at Veda in Uppland we learn that Torsten ‘bought this farm, and made the money east in Gardariki’. The runic evidence thus clearly shows that land was in fact held by individuals, and that it could be inherited and sold. Furthermore, rune-stones occasionally provide evidence of one man owning several farms, as is the case in Uppland (Älgesta and Nora), where we can document a family estate with farms as far as thirty
kilometres apart. Similarly, in Hälsingland the Malsta rune-stone is interpreted as showing that Hä-Gylfe owned the hamlet of Malsta as well as the three hamlets Åkern, Bästdal, and Stamnäs further north.29 Along with place names, runic inscriptions also testify to a group of men who were entitled to hold land by virtue of their position in a military organization under a king or chief. The place names Karleby, Rinkeby (or Rickeby), Svenneby, and Tegneby refer to karlar, rinkar, sveinar, and thegnar; all ranks in the retinue of a chieftain.

As recent research has highlighted, the difference between the continental, feudal system of land tenure and Scandinavian Viking Age tenure is smaller than previously thought. Studies of medieval landownership in Östergötland indicate that the king and his followers owned large areas of land there in the Viking Age. Early large-scale landownership is also documented from the Jarlabanke rune-stones in Uppland, one of which states that Jarlabanke owned ‘this hundred’ or district. Stefan Brink concludes that the information suggests that

a high leader in society could own or at least control large areas of arable land and thus presumably farms. He could probably handle these farms and lands at will, placing slaves to work entire farms or pieces of land, or distributing farms and land to tenants.30

There is a close relationship between the increased centralization of political power and landholding and the development of Viking Age agriculture. Increased capital investment in agriculture in the form of new and more efficient agricultural iron implements served to increase labour productivity. This formed the basis for a new division of labour, both socially and geographically, which marked a clear change from the previous period. The economic basis of what once were small kingdoms or lands (AD 200–600) was partly a local food exchange system and partly a highly specialized international exchange of raw material for textiles and of prestige goods. By contrast, in the late Iron Age there were many signs that the regional division of labour was increasing. Specialized iron production expanded in the interior of central Sweden and in the north. Inter-regional trade in iron – for weapons and agricultural tools – gathered pace. The trade in quernstones, soapstone cauldrons, whetstones, textiles, and other objects was also very much part of this new inter-regional exchange. It was as a direct result of this trade that new political centres emerged in Uppland in the Mälaren valley.
2. Agriculture in Sweden 800 BC–AD 1000

1 For southernmost Sweden, see Berglund et al. 1991, 417 and passim; for biodiversity, see Berglund et al. 2008; for northern Sweden, see Engelmark 1976, 99.
2 Grigg 1974, 152; Myrdal 2006a, 117.
3 Myrdal 1984; Olausson 1999; for the broad European context, see Roymans 1999; and Zimmerman 1999.
4 For Östergötland, see Petersson 2001; for Uppland, see Apel et al. 2007; and for Skåne, see Welinder 2009.
5 Myrdal 1984; Zimmerman 1999.
7 On the clearance of alder carrs, Berglund et al. 1991, 430, write that it was ‘probably for hay-cutting and grazing as well as for fuel’. Some researchers have interpreted this as a natural development while others have seen it as a deliberate clearance to create hay-meadows or pastures (Iversen 1973; Göransson 1977). Rasmussen 2005 documents such changes around 650 BC on Funen, Denmark’s third-largest island, and interprets them as the creation of hay-meadows. For the specific evidence, based on species composition, see Lagerås 2002, 406–407; and Gaillard et al. 1994, 62.
9 For Gotland, see Lindquist 1974; and Carlsson 1979; for Denmark, Nielsen 1984; for Skåne, Nordholm 1937; Hannergard 1938; and Martens 2008.
11 Changes in Iron Age crops have been treated by Hjelmqvist 1979; Engelmark 1992; van der Veen & Palmer 1997; Willerding 1980, 135; Viklund 1998; Skoglund 1999; and Robinson 2003. Engelmark 1992 argues that the reason for the increase in hulled barley was that it responded better to manure, cf. Lagerås & Regnell 1999.
12 Brink 2008a.
13 Penack 1993.
14 For Iron Age bread in Sweden, see Hansson 1997 and Bergström 2007; for Helgö and rotary querns, see Zachrisson 2004; for the Tune stone, see Brink 2008b.
16 For Gotland, see Lindquist 1974; for Oland, see Fallgren 1993.
17 Benecke 1994a; id. 1994b.
18 Widgren 1983.
19 Stone walls were in use throughout the first millennium AD and into historic times. The direct stratigraphic datings that can be firmly connected to the spatial organization described here are still few, and are frequently contradictory. Petersson 2008 argues that the dry-stone wall enclosures might be considerably younger, cf. Widgren in MS.
22 Gren 2003 makes the case for bush fallowing and hoeing; Lagerås & Bartholin 2003 interpret the farming system in a clearance-cairn field as one based on manuring and the use of ards; Pedersen & Jönsson 2003 also argue for ard tillage; see also Hammar 2003.
NOTES

24 Widgren 1998 lays out this categorization in detail, using analyses provided by Odner 1972; Enckell et al. 1979; Fallgren 1993; Herschend 1993; and Olausson 1997.
27 Widgren 1983.
29 For the text and possible interpretations of the rune inscriptions, see Sven B.F. Jansson 1987; for an interpretation of the Malsta stone, see also Brink 1999.

3. Farming and feudalism 1000–1700

1 Kulturhistoriskt lexikon för nordisk medeltid 1–22 and a catalogue of its articles on agriculture in Myrdal 1982. Generally on agriculture, see Myrdal 1985; and Myrdal 1999a.
2 For ‘source pluralism’ as a method, see Myrdal 2008.
3 Söderberg & Myrdal 2002; for village maps, see Tollin 1991.
4 Ganshof in 1944 formulated the defence of the ‘narrow’ definition, and Reynolds 1994 has been foremost among critics of this narrow definition. French historiography has been more positive to fiefs as a core concept of ‘feudalism’. Articles in Poly & Bournazel 1998 give not only a European overview but also examples from other cultures.
5 Bloch published in French 1939–1940 an important book translated into English in 1961; see also the foreword by Postan 1961.
6 Hilton 1992, 9–11 for a broad definition, but in the Marxist tradition; Bois 1992, 84–5 has a similar approach and stresses the role of the market economy. From a non-Marxist view-point Hatcher & Bailey 2001, 76–7 explain that to equate serfdom with feudalism is a gross simplification.
7 For an overview of medieval data, see Myrdal 2010b; for early modern data, see Palm 2000; and Edvinsson 2009, whose figures are closer to Myrdal 1999a, 222, though the difference between Palm and Edvinsson is not dramatic.
8 Recent archaeological and palaeo-ecological research is summarized in Lagerås 2007; for studies of individual villages, see Åstrand 2007 for south Sweden; and Svensson 2008 for central Sweden.
11 For the granges of Alvastra, see Holmström & Tollin 1990.
12 For the European famine, see Jordan 1996; for Scandinavia, see Hybel 1997; for cattle plagues in Europe, including Denmark, see Newfield 2009. Sweden was hit by the cattle plague in 1315.
13 Mogren 2000 gives both archaeological and literary evidence.
14 Medieval plagues in Sweden and their effects on population trends have been examined in Myrdal 2006b and Myrdal 2009, which build on Myrdal 2003. For a European overview, see Cohn 2003 and Benedictow 2004, who differ totally in their interpretation of the nature of the disease.
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