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RESEARCH ARTICLE

The origins of Odense – new aspects of early urbanisation in southern Scandinavia

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ABSTRACT

The article presents an updated study of the centuries prior to Odense's traditional 'birth certificate' of AD 988, resulting in a new model for the urbanisation of Odense. The conclusion reached is that there was activity of a permanent and possibly urban character in Odense from the end of the late eighth century until the late tenth century. The town's development can be followed through three phases. Phases 1 and 2 cover the periods AD 700–900 and AD 900–100, respectively, while phase 3 covers the period AD 1000-1101. During phases 1 and 2, the proto-town develops through bottom-up processes, such as network, crafts and possibly trade. After AD 1000, Odense develops into a town proper, under royal influence. The model from Odense provides the background for a fresh view of urbanisation in southern Scandinavia in general. A three-phase model is proposed. Phase 0 constitutes the emporia of the eighth–ninth century, which perhaps primarily is satellites in a trading network controlled from the south. Phase 1 takes the form of locally initiated and based incipient urbanisation extending from the end of the eighth century until the tenth century. Phase 2 comprises the royally established towns from around AD 1000 onwards.

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Introduction

This article is based on the research project *The origins of Odense – New aspects of early urbanisation in southern Scandinavia* the aim of which is to analyse when Odense emerged as a city, the characteristics of the city's earliest structure and the background for the formation of the city. The project furthermore should give a new perspective on the general urbanisation process in southern Scandinavia.[1]

The early urbanisation of southern Scandinavia is conventionally perceived as being comprised of two stages, with the first defined by Hodges type B emporia, which were established from the eighth century, and the second by royally founded towns, from around AD 1000 (Hodges 1982, p. 50ff.; Skre 2007b, p. 45). Odense is mentioned for the first time in AD 988 in a deed of gift from the German emperor Otto III, and this document, Odense's so-called birth certificate, is the reason why the town normally is assigned to the latter group of town foundations (Albrectsen 1970, p. 128ff.; Thrane *et al.* 1982, p. 113ff.; Madsen 1988b, p. 97) (Figure 1).

The aim of the present article is, through a new appraisal of the evidence from Odense relating to the centuries preceding AD 1000, to provide a nuanced view of this bipartite development.[2] Although Odense should not be ascribed to the group of early emporia, below the central part of present Odense there were activities of a permanent and possibly urban character extending from the end of the eighth century until the end of the tenth century. Consequently, the town probably developed gradually rather than being a new establishment planned by the central power. Examples of other Danish towns where signs of a parallel development can be traced, are highlighted below.

Based on this overview, an alternative developmental sequence is suggested for urban development in southern Scandinavia, in which phase 0 constitutes the emporia of the eighth– century, which should perhaps primarily be seen as satellites in a trading network controlled from the south, while phase 1 takes the form of locally initiated and based incipient urbanisation extending from the end of the eighth century until the tenth century, and phase 2 comprises the royally established towns from around AD 1000 onwards. Phases 0 and 1 largely correspond to Hohenberg

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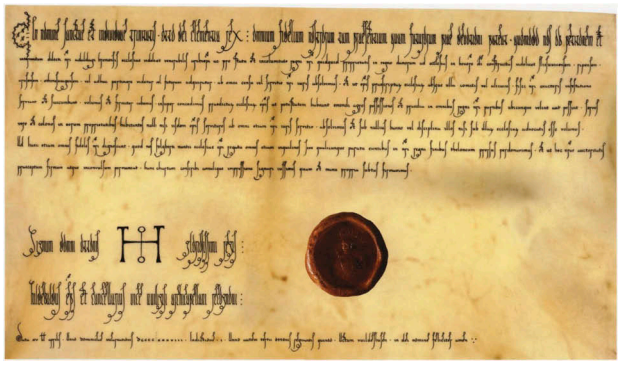

Figure 1. Odense's 'birth certificate' (Christensen and Nielsen 1975, p. 114, no. 343). The document shown here is a copy created from the handed-down text and documents from the emperor's administration. The original document disappeared centuries ago.

and Lee's 'Network Systems' and 'Central Place Systems', respectively (1995, p. 4f., p. 55ff.).

Data material

A major challenge to interpretations based on the archaeological record from Odense is the latter's fragmentary nature. The traces are thus relatively few and have predominantly been identified in minor excavation trenches, with their consequent limited opportunities with respect to the evaluation of broader contexts. Though the data material still is relatively sparse, there has been a development on three fronts. First, extensive metal-detector surveys in Odense's hinterland have yielded a large and auspicious assemblage of metal artefacts. This raises the question of whether Odense was the only place possessing central functions between the Late Iron Age and the earliest Middle Ages and, accordingly, helps to provide a perspective on the background for urbanisation (Henriksen 2013). Second, investigations associated with the enormous building and construction activities in the centre of Odense in recent years have posed several questions with respect to the emergence of the town and its earliest structure (Runge 2016). Third, the new investigations at the Viking fortress of Nonnebakken have provided a basis for a new perspective on the relationship between the town and the fortress (Runge 2017, p. 51ff.).

Despite this addition, the record from Odense's earliest history remains fragmentary. Given this situation, we could choose to ignore the evidence from these centuries and simply classify it as representing various scattered activities, or an agrarian settlement prior to the founding of the town proper around AD 1000, as is seen in the earliest traces of the town of Bergen in Norway (Hansen 2008, p. 22f.). The reason we do not take this approach, but instead attempt to pursue the urban elements, is because the record, despite its limitations, has the potential to nuance the general picture of Odense's foundation and thereby inspire rethinking of the general urbanisation process in southern Scandinavia.

Geographical and chronological framework

The study's primary geographical frame of reference is Odense's medieval urban extent and the land to the south of the river Odense Å that hosted the ring fortress of Nonnebakken. It therefore encompasses an area extending from Allégade in the south to Slotsgade in the north (c. 800 m) and from Ny Vestergade in the southwest to Fru Kirkestræde Gade in the northeast (c. 1000 m), a total of more than 700,000 m^2 (Figure 2).

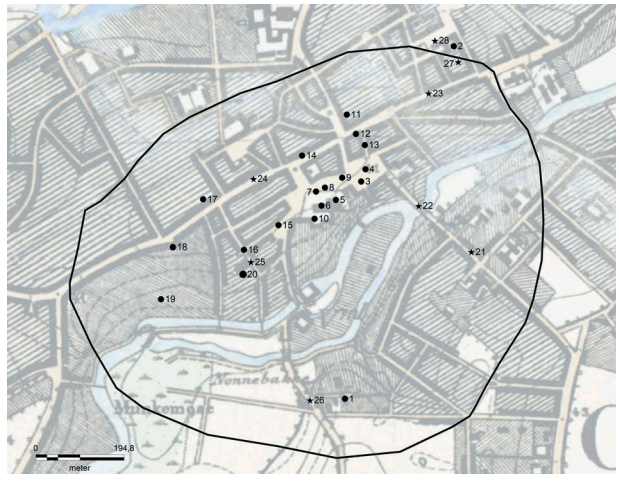

Figure 2. The primary study area (black line) marked on the first edition ordinance map from the second half of the nineteenth century. *1: Nonnebakken. 2: Møntergården. 3: St Alban's Church. 4: St Alban's churchyard. 5: St. Canute's Church. 6: St. Canute's churchyard. 7: The 13 graves at St. Canute's churchyard. 8. Skt. Knuds Kirkeplads I. 9: Skt. Knuds Kirkeplads II. 10: Klosterbakken. 11: Fisketorvet. 12: Skomagerstræde/Overgade 1–3. 13: I. Vilhelm Werners Plads. 14: Vestergade 13–15. 15: Klingenberg. 16: Mageløs/Klaregade. 17: Vestergade 43–49. 18: Vestergade 70–74. 19: Filosofgangen 9–17. 20: Bispegården. 21: Albanigade. 22: Torvegade. 23: Vestergade. 24: Overgade. 25: Klaregade. 26: Hunderupvej, 27: Møntestræde, 28: Sortebrødre Stræde, 29: Slotsgade, 30: Ny Vestergade, 31: Frue Kirkestræde, 32: Allégade.* Background map: *© The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

The timeframe for the study is from the Late Germanic Iron Age, i.e. from c. AD 700, until the canonisation of Canute IV, subsequently known as Canute the Holy, in AD 1101. The Late Iron Age is the period when the earliest indications of state formation and urbanisation are evident in southern Scandinavia (Näsman 1991a, Hansen 2015, p. 186ff.; Roesdahl 2016, p. 176f.), while Canute's canonisation marks a shift in Odense's history, when the town became characterised by powerful religious markers and thereby took a new path (Nyberg 1982, p. 159; Johannsen *et al.* 1998–2001, p. 1729; Bjerregaard and Runge 2017, p. 10ff.).

The subdivision of the chronology of the Late Germanic Iron Age and the Viking Age is conventionally based on animal styles and ornament inventories (Ørsnes 1966, Højlund Nielsen 1987, Lund Hansen 1988, p. 32f.; Skibsted Klæsøe 1999). The material evidence takes, however, a different form in the present context and only a coarse chronological subdivision is possible, which also cuts across the aforementioned period divisions. Consequently, a tripartite division is consistently employed here, i.e.: (1) final part of Late Germanic Iron Age-Early Viking Age (c. AD 700–900), (2) Late Viking Age (AD 900–1000) and (3) Late Viking Age-earliest Middle Ages (c. 1000–1101). The transition from the Germanic Iron Age to the Viking Age is fixed here at c. AD 750.

The topography and geology of Odense and its hinterland

Odense is situated on relatively flat, even terrain, comprised variously of clay, gravel and sand (Smed 1962). The terrain is cut through, from southwest to northeast, by a c. 175–500 m wide lateglacial meltwater valley in which the river Odense Å flows on its way to Odense Fjord. The town of Odense was established at precisely the point where the distance between the two sloping sides of the valley is least.

On Georg Braun's map of Odense from 1593 (Jørgensen 1981), islands can be observed in the middle of the river in two locations immediately to the south of the town (Figure 3). Both islands are undoubtedly sand banks that had formed in the river and which, in the Late Middle Ages and post-medieval times, made the crossing easier between the areas to the north and south of the river. One is at the western end of the medieval town, where Klaregade, on the north side of the river, is joined, via two bridges, with Hunderupvej, south of the river. About 400 m further downstream, the later Torvegade, on the north side of the river, is linked via a small island with the later Albanigade on the south side (see Figure 2). The degree to which these sand banks existed when the town developed is unknown, but it was apparently in precisely this stretch that the river dynamics provided the necessary conditions for their development. The earliest archaeological evidence of settlement in Odense was discovered close to the western crossing, and south of the river lay the Nonnebakken ring fortress beside the continuation of the road network. This could indicate that the western crossing, at least, has been in use since the tenth century, and perhaps even earlier, and that it played a central role in the town's development.

Figure 3. Braun's prospectus. After Füssel (2008), p.184.

The centre of medieval Odense developed on the level terrain on the north side of the river, and extended all the way out to the erosion slope created by the meltwater river at the end of the last Ice Age. The present-day terrain in the area of the medieval town has its highest point around 14 m above DNN (Danish Ordnance Datum), directly northeast of Odense Cathedral, St Canute's Church. In the same area, a long stretch of road running east-west has been investigated. This has the same orientation and location as the medieval, and still extant, Overgade-Vestergade route through the town. The cobbled road was laid around AD 1100 on a level surface at c. 11 m above DNN, from which the topsoil had been removed. By comparing the top levels for the glacial deposits in the archaeological trenches and in

the cores taken across large parts of the medieval town (cf. Zinglersen 2004), it can be demonstrated that features from the tenth–twelfth centuries everywhere along a more than 800-m long stretch of the river were cut down from an even and well-drained surface around 11–12 m above DNN. To the south, this surface fell abruptly down towards the river, the water level of which presently lies around 4.7 m above DNN. To the north, c. 175–250 m distant from the northern slope of the meltwater valley, the level surface was bounded by a hollow that ran parallel with the river. A minor watercourse – Rosenbækken (see Figure 3) – flowed east along this hollow, into Odense Å. The town is, accordingly, situated on an elongated, even and – apart from in the west – naturally delimited and well-drained surface, covering no less than 20 ha. Investigations in the town centre in recent years have demonstrated that this surface was not, as previously stated (Christensen 1988, Figure 14) bisected north-south by a wetland area.

On the south side of the river, the ring fortress of Nonnebakken was built on an even, clayey promontory, which extended all the way out to the southern erosion margin of the meltwater valley. There was some levelling of the site in connection with the construction of the fortress, but pits and holes for structures associated with it appear to have been cut from a level around 9–9.1 m above DNN. Between the fortress and the river was an evenly sloping, c. 40 m wide surface, presumably a lateglacial river terrace, and investigations here have shown that the river course has, at no point in time, been closer to the fortress plateau (Jensen and Sørensen 1990).

The water route to Odense

Prior to 1803, when a canal was dug linking Odense Fjord with the northwestern periphery of the town, c. 1.6 km north of the cathedral (Harnow 2005), it was not possible to sail to Odense in larger vessels. The distance from the medieval town centre to the innermost and now drained and reclaimed branch of Odense Fjord, Bågø Strand, was about 3.5 km as the crow flies, while the journey along the meandering course of the river to its mouth in/at Seden Strand was about 11 km. About 1.3 km to the northwest lay

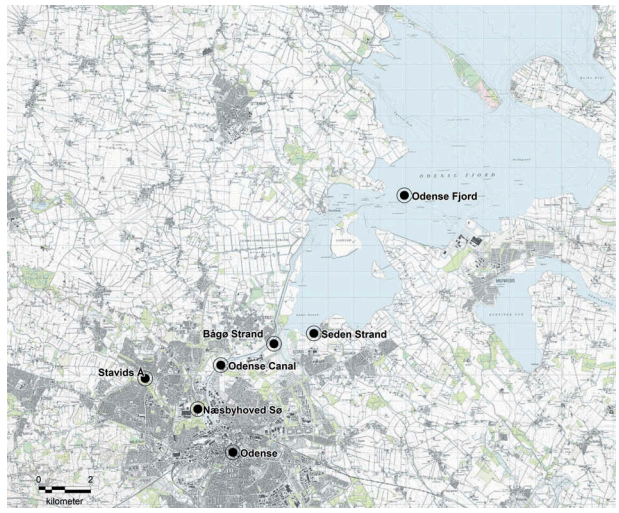

Figure 4. The locations of Odense, Odense Canal, Odense Fjord, Bågø Strand, Stavids Å, Næsbyhoved Sø and Seden Strand. Drawing: Mads Runge.

the lake Næsbyhoved Sø, which was connected to Odense Fjord via the watercourse Stavids Å; the lake was drained and reclaimed in the nineteenth century (Tårup 1934) (Figure 4).

In most works dealing with the first centuries of Odense's history, the assumption is made that it was possible to sail in to the town, via Odense Å or Stavids Å/Næsbyhoved Sø, with the vessels of Viking Age and Early Middle Age types (Lauritsen 1873, p. 1ff.; Tårup 1934, p. 518; Thrane *et al.* 1982, p. 22f., 108, 124ff.; Christensen 1988, p. 29, 47ff.; Moesgård 2015, p. 84; cf. also Crumlin-Pedersen *et al.* eds. 1996, p. 134). Two fundamental conditions for this assumption are: (1) that the water level in these watercourses was higher than is the case today (Thrane *et al.* 1982, p. 22f.; Madsen 1988a, p. 35) and (2) that the vessel types of the time were of shallow draught.

There is no evidence from the banks of Odense Å to suggest that the water level was higher at the transition from the Viking Age to the Middle Ages. The only available evidence that the river has, at any point in postglacial times, had a higher water level than that of the present day, comes from an excavation in the area between Nonnebakken and the river: A degraded and humified peat layer containing brick/tile fragments that is presumed to have been formed when the river was dammed in conjunction with the construction of mills downstream in the twelfth century (Madsen 1988a, p. 34ff.). This could have led to an/a – albeit periodic – raising of the

water level in this area by 0.5–1 m. Given a higher water level, the area now known as Munke Mose (see Figure 3), which appears on Braun's map from 1593 as above water, would have been flooded. Mill dams are, however, not the only factor to have influenced the potential for navigation on the river. The water where the river meets the sea (i.e. Odense fjord) is important. Due to extensive drainage works, the shoreline in Odense Fjord has changed significantly since the Viking Age (Stenak 2005, p. 123ff.). On the other hand, there is nothing to indicate that the sea level was higher at that time than it is today. Given the fact that the world's oceans are presently in transgression, it is possible that the water level in the fjord may have been a little lower than it is today (Binderup 1996, p. 29). This would, in turn, have led to a lower water level in the river. The depth of water in the river has, however, also been influenced by the sedimentation which the river itself has created with the material it transported along the c. 60 km of its course (Riis *et al.* 1999). Moreover, where it met the sea, the sedimentation created a delta, and fluctuations in the morphology of this would mean that the approaches to the river channel could periodically have been difficult to navigate, as is known to have been the case in historical times (Lauritsen 1873, p. 2; Harnow 2005, p. 26ff.).

On its way from the town to the fjord, Odense Å, flows almost east-west along a c. 5.5 km stretch to Åsum, after which it turns sharply c. 80° and flows NNW-SSE along the remainder of its course to the sea. On the first stretch, its course is characterised by meanders and the river channel here can be termed as mature. Its course is erosive over long stretches and here it can be seen that the water cuts into and is delimited by the moraine deposits on both banks. On these stretches, the width of the Viking Age river cannot have exceeded the c. 12 m it measures today. Navigability would have been further hindered by unpredictable riverbed conditions in the meanders. Here, there is sedimentation of transported material at the lee side so that a considerable part of the bed consists of sand banks, over which the water depth is modest. On its final stretch towards the sea, the river flows largely through its own sediments and must consequently be termed an old watercourse of limited fall, with a width on its final reaches of 30–50 m. At Åsum, and thereby at the transition from the mature to the old watercourse, there is a threshold in the river and this has constituted a significant hindrance to further navigation upstream towards the town.

In evaluating of the river's navigability, it must also be taken into consideration that the vegetation along the banks of the river constituted a potential but realistic hindrance – especially for masted vessels. On the stretches where the river banks are formed by moraine deposits, it would not have been impossible to keep the vegetation down, even though this would have involved felling or pruning trees and bushes along a total stretch of around 10 km. On the lower reaches of the river, where it largely flows through unconsolidated sediments, cutting trees and undergrowth could have involved considerable difficulties.

An analysis of the lower reaches of Odense Å has shown that, overall, it must be considered inconceivable that Viking Age long-ship types, such as the Ladby ship, with a length of 22 m and a draught of c. 1 m, would have been able to sail up the river to the town and the ring fortress. The use of sail power is unthinkable and oar propulsion seems, at least in places, to be rendered impossible by the narrow course of the river, which can be assumed to have been further constricted by vegetation and sand banks. Furthermore, the risk of going aground in the bends of the river, which in some places form a right angle, would have been considerable for a vessel of these dimensions – and even for smaller vessels such as the Fotevik 1 type, with a length of c. 10 m and a draught of c. 1 m (cf. Crumlin-Pedersen 1991). Conversely, it seems likely that yet smaller vessels, such as the boat from Gislinge Lammefjord, with a draught of 0.3 m, a length of 7.7 m and a cargo capacity of c. 1 tonne (Gøthche 1995), would have been able to travel all the way up the river by oar power, possibly augmented by poling when navigating the sections where the banks are close together and there is only a narrow navigable channel.

On the lowermost reaches, where sailing with larger vessels must have been possible without major hindrance, the left bank of the river meets moraine deposits in several places. This is the case immediately north and south of the village of Biskorup, and on this latter section, place names such as *Skibmaden, Skibagre* and *Skibeng* testify to activities related to navigation (Crumlin-Pedersen *et al.* eds. 1996, p. 141f., Figure 12; Harnow 2005,

p. 26ff.). It seems obvious to conclude that there could have been an entrepot here, where goods from sea-going vessels could be transferred to smaller vessels and barges – or to forms of land transport, which then could proceed along a level, c. 4 km route in to Odense. Archaeological investigations have not been undertaken in the area, but a stray find of an axe dating from the Viking Age or Early Middle Ages provides an indication of activities here in the centuries around AD 1000.

Innermost in Odense Fjord there has been access, via the lower reaches of Stavis Å, to the lake Næsbyhoved Sø, the southern shore of which, until its final drainage and reclamation in the mid-nineteenth century, lay 1.6 km to the north of the cathedral (Tårup 1934, p. 518). As the area here has undergone major changes, it is no longer possible to evaluate the degree to which it was possible earlier to navigate the lower reaches of this watercourse using larger vessels. However, the lake was shallow and had the character of a bog that was growing out across the open water. This means it would not have been possible to land on the boggy shores without the construction of jetties or other forms of fixed structure. Nothing of this kind has been demonstrated and, similarly, there is a total absence of finds from the Iron Age and Viking Age from the lake's shore-near areas.

It must therefore be concluded that the areas of land on which Odense and Nonnebakken were established could not be reached with large vessels in the Late Iron Age or Viking Age. This demonstrates – as also shown by other studies (Ulriksen 2011) – that the growth of local centres was not necessarily conditional on ready access to the sea.

From central space to urban place

The area of Odense Fjord and the Hindsholm peninsula represents a marked regional centre of wealth throughout the Iron Age, reflected in particular by a concentration of graves containing Roman imports from the second to fifth centuries AD and several gold hoards from the fourth to sixth centuries AD (Henriksen 2009, p. 340ff., 2010, 2013, Henriksen and Horsnæs 2015, Feveile 2016, 2018) (Figure 5). From the Late Iron Age and Early Viking Age the Glavendrup monument, with ship setting and rune stone, the rich Rosenlund grave (with the Rønninge

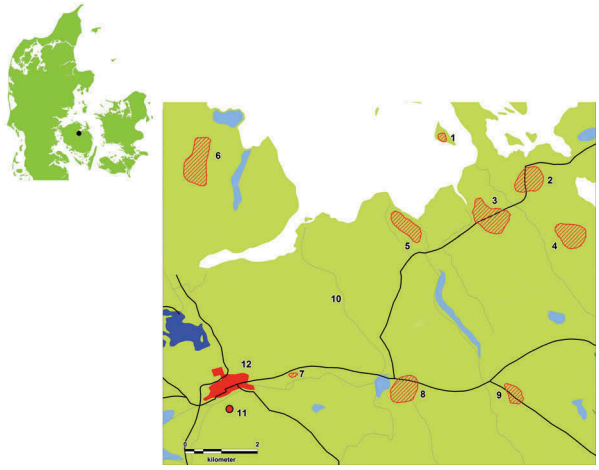

Figure 5. The area around Odense Fjord with the locations of Odense and the large metal-rich sites marked on the Royal Society Map from the second half of the eighteenth century (digitised by Peder Dam, University of Copenhagen). Dark grey (dark blue): Lake. Light grey (light blue): Meadow/bog. Thin line (light blue): Watercourse. Black line: Highway. 1: Tornø. 2: Dræby. 3: Vester Kærby. 4: Vesterskov. 5: Engløkken. 6: Lumby. 7: Ejby Mølle. 8: Åsum. 9: Marslev. 10: Odense Å. 11: Nonnebakken. 12: Odense. Background map: © *The Agency for Data Supply and Efficiency. Drawing: Mads Runge.*

rune stone nearby), the Ladby grave and the barrages in Kertinge Nor stands out (Crumlin-Pedersen 1996, p. 187f.; Jacobsen 2000, Sørensen 2001, Nørgaard Jørgensen 2002, p. 130f., 149f; Feveile 2016) (Figure 6). In total the area can be seen as a growth zone within which, with the possible exception of a couple of localities that, as will be seen, are conspic-

Figure 6. The locations of Odense, Kertinge Nor, Ladby, Rosenlund, Rønninge and Glavendrup. Drawing: Mads Runge.

uous due to their size, it is not possible to point out just one or two dominant localities, but rather observe a number of central functions distributed across the landscape (Henriksen 2013, Christensen 2014b, p. 86ff., 2016).

During the Late Iron Age, Viking Age and Early Middle Ages, the shores of the southern part of Odense Fjord and on the Hindsholm peninsula were characterised by a number of metal-rich sites, and the area should presumably be seen as a regional growth area. These sites are almost exclusively represented by the presence of metal artefacts in the plough soil, revealed by metal-detector surveys, whereas actual excavations have on the whole not been undertaken. Consequently, the role or function of these sites is poorly illuminated, but there is a good deal of evidence suggesting that elements of trade and handicrafts occur at most of them (Henriksen 2013, Henriksen and Horsnæs 2015, Feveile 2016, 2018). Until recently, the distribution of these localities was largely limited to the eastern side of Odense Fjord and the area extending out towards Hindsholm. Over the last few years, however, several new metal-rich localities have turned up, including some in the southern part of the fjord's western side. Much suggests that sites of this kind were associated with virtually all the bays and inlets on the fjord, where there must have been good anchorages and landing places. The locality of Vester Kærby, located east of the fjord, stands out among the metal-detector sites, possibly due to its very considerable extent (Henriksen and Horsnæs 2015) (Figures 7 and 8). A similar locality recently discovered at Lumby, west of the fjord, possibly also represents a level above the norm (Figures 9 and 10). To determine whether these extensive (in terms of area) finds distributions really constitute a single coherent locality or several smaller ones it would be necessary to carry out archaeological excavations.

Whether there was a metal-rich site in the Late Iron Age in what is now the centre of Odense, corresponding to those found by metal-detector in the hinterland, is difficult to ascertain, because very large parts of the town were built without prior archaeological investigation and at a time before metal detectors became an everyday part of archaeology. It is, however, possible that this area was one of many hosting trade and craft activities. As will become evident below, however,

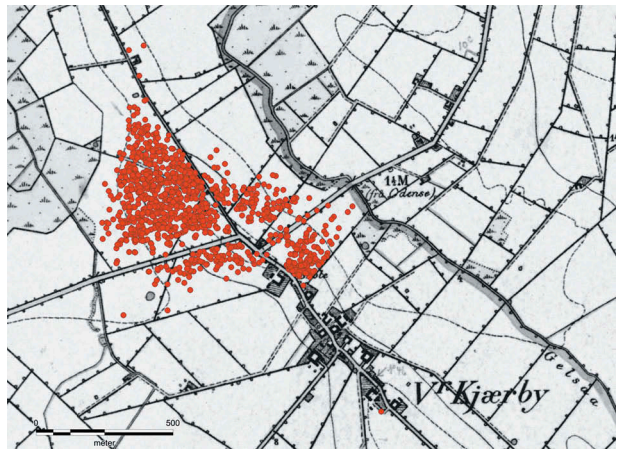

Figure 7. Metal-detector finds at Vester Kærby plotted on the first edition ordnance map from the second half of the nineteenth century. The finds extend in date from the Late Neolithic to modern times. Background map: © *The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

Figure 8. Selected artefacts from Vester Kærby from the Late Germanic Iron Age (3,4,8,13,15,16), Viking Age (1,2,5,6,9,11) and Early Middle Ages (7,10,12,14). Photos: Asger Kjærgaard and Nermin Hasic.

the finds from the pit-house area at Vestergade 70–74 and Mageløs/Klaregade indicate that this first became established in the late eighth or

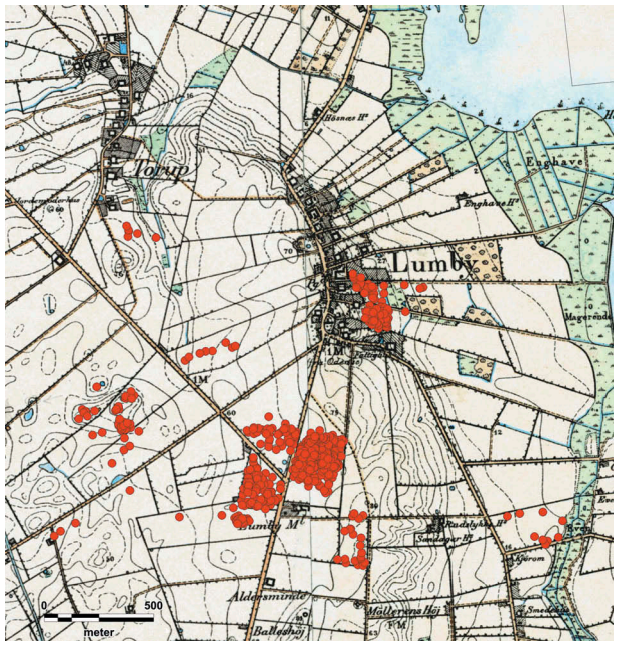

Figure 9. Metal-detector finds from Lumby plotted on the first edition ordnance map from the second half of the nineteenth century. The finds extend in date from the Early Bronze Age to modern times. Background map: © *The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

Figure 10. Selected artefacts from Lumby, dating from the Late Germanic Iron Age (2, 3, 6–9, 11), Viking Age (1, 4, 5, 12, 14–17) and Early Middle Ages (10, 13). Photos: Nermin Hasic.

ninth century. At the same time the position of earliest Odense differed from the sites associated with the fjord. As described above, the centre of Odense lies some distance inland from the coast, a situation further emphasised by the fact that navigational conditions in Odense Fjord are and were extremely challenging.

Under any circumstances at the end of the Iron Age or beginning of the Viking Age, the prelude to the development of permanent and pre-urban features is seen in what later became Odense. By the turn of the millennium, at the latest, the central functions became concentrated here, and the establishment of Odense as a regional urban centre became a reality.

The question is then, why was it Odense, of all these localities, that became the central locality? Other questions are, why and how the change occurred? The questions are in these years treated in other projects, cf. note 2, but a few points can be outlined already.

Although Odense has an obviously advantageous position in relation to land traffic (Porsmose 1996, p. 201), it lies further away from water transport routes than the metal-rich sites around Odense Fjord. But perhaps it was this recessed, inland location that was the crucial factor in determining the site of the primary centre? The situation is consistent with for example the inland Iron Age centre at Gudme, where the associated landing place, Lundeborg, has an exposed location on the coast (Henriksen 2009, p. 340ff.). A recessed, inland location also characterised Late Iron Age central places on Zealand (Rindel 2002, p. 194f.).[3]

With the massive discovery of metal-rich sites in recent years, both to the east and west of the southern part of Odense Fjord, it has become still more evident, that Odense can now be seen to have occupied a very central position in the major trade networks constituted by the numerous natural landing places and metal-rich sites around Odense Fjord. The central position and role of Odense is underlined by the location of the afore mentioned magnates' monuments such as Glavendrup, Ladby, Rosenlund etc., within a radius of up to 10–20 km of Odense. It should possibly be seen as a parallel to

the Gudme area in the Early Iron Age, where the warrior graves were sited around the periphery of the area. Glavendrup (18 km), Ladby (18 km), Rosenlund (18 km) (near Rønninge rune stone, 22 km) perhaps reflect magnates who were subservient to, and dependent on, the king and his predecessor in Odense (Crumlin-Pedersen 1996, p. 187f.; Jacobsen 2000, Sørensen 2001).

Urbanisation

Historical background

In general terms, two lines of thought can be followed in the analysis of the earliest urbanisation in southern Scandinavia. One takes its point of departure in the towns being an expression of a top-down or exogen process, in which the Crown plays a crucial, central role (Andrén 1985, 1994, Christensen 2004, Ulriksen *et al.* 2014). While the other emphasises that a number of bottom-up or endogen factors, such as trade networks and agrarian conditions, could have contributed to urbanisation (Mathiesen 1922, 1927, Hohenberg and Lees 1985, p. 4; Sindbæk 2007, Holst 2014). Some researchers even talk of urbanisation in terms of processes that collectively involve all members of society (Kleingärtner 2014, p. 235ff.). It has also been pointed out recently that, in general, operating with definitions of urbanity that are too narrow can be problematic: Absence of one of the defining aspects or features need not necessarily mean that a given locality should not be perceived as a town (Krongaard Kristensen and Poulsen 2016, p. 13ff.). On the other hand, one or a few urban elements do not, in themselves, mean that a locality should unequivocally be considered as urban. For example, localities such as Tissø, Lejre and Uppåkra contain several elements that can be considered as urban without these places otherwise being considered as towns. Furthermore, complexes such as the Trelleborg-type ring fortresses have structures and functions that, in other contexts, would justify an urban definition. The question of urbanity is therefore extremely complex, and one common uniform model probably cannot be proposed and sustained.

A starting point for the discussion of the definition of a town is the ten criteria for urbanisation proposed by Gordon V. Childe in 1950 (Childe 1950). Of these, it has since been highlighted that conditions relating to the following are the most important: (1) denser settlement relative to the surroundings, (2) presence of specialised occupations or trades unrelated to food production, (3) accumulation of a surplus production for leading families, (5) presence of a ruling class and (10) a centralised power or state organisation (Smith 2009).

Subsequently, several researchers have, with clear reference to Childe's model, pointed out that important criteria for urbanisation are population density, permanent settlement of a certain size, the majority of the population subsisting by trade and craft activities and a locality that is clearly delimited from its surroundings (Weber 1958, Hohenberg and Lees 1985, p. 22f., Skre 2007b, p. 46). A rough definition of a town is given in the Swedish project *Medeltidsstaden* (The Medieval Town), where it is suggested that a town, at least in a medieval context – must satisfy three groups of criteria: functional (position in relation to hinterland and other towns), topographic (internal organisation and layout) and legal and administrative conditions (privileges, town council, etc.) (Andersson 1972). Due to a town's many special functions, such as a trade and craft centre, it also becomes a hub for many meetings between people; the latter is a condition on which the network theory, in particular, focuses attention upon. In continuation of this line of thought, it has been debated whether networks and meetings between people which constitute a town relative to the surrounding world – or whether it is a town that creates these networks and encounters (Sindbæk 2007).

Proto-towns, market places, villages, towns and other sites with urban features

A crucial point in the discussions on early urbanisation relates to the minimum criteria that must be satisfied before a settlement can be classified as a town. The earliest towns, the proto-towns, have therefore interfaces with seasonal market places, contemporaneous villages and actual towns.

Several trade and craft sites from the eighth and ninth centuries have town-like features, but the requirement for permanence of the settlement, in particular, means that to date only four localities in southern Scandinavia – Birka, Ribe, Haithabu and

Figure 11. Locations of the emporia Ribe, Hedeby, Birka and Kaupang. Drawing: Mads Runge.

Kaupang – have qualified for classification as proto-towns or emporia, according to Frankish and Anglo-Saxon terms and models (Hodges 1982, Skre 2007c, p. 453, p. 461, 2011, p. 207; Croix 2015) (Figure 11). The term Special Economic Zones has also been suggested for these sites, for which a clear terminology in general is lacking (Kalmring 2016). It has been pointed out that emporia were established on the borders of the realm in order to signify and mark out its extent, while market places were positioned more centrally in the realm (Skre 2007b, p. 461f.). The placing of emporia on the periphery of the realm can, on the other hand, also be linked to the fact that this often constituted the ideal position in relation to their role in a long-distance network (Kalmring 2016, p. 15f.).

The physical difference between early towns and contemporaneous (larger) villages and magnate's farms was, in the eyes of the population at that time, probably not considered to be particularly marked, given that the earliest towns must be presumed to have been relatively small in size and also to have accommodated several agrarian functions (Reynolds 1977, p. ix; Nilsson 2015, p. 262). Conversely, the relatively dense permanent population and trade specialisation evident in the towns created a society that was characterised by a much greater degree of interaction than occurred in the rural environment (Skre 2007b, p. 46).

Proto-towns also differed from the better consolidated and multi-functional medieval towns. Factors such as special fiscal conditions, the presence of two or more churches and the minting of coins are characteristics of the latter (Andrén 1985), to which a role as an administrative centre for the hinterland can be added (Skre 2007b, p. 45). This difference naturally reflects developments in the associated society, with the consolidated power of the state and the development of ecclesial institutions around AD 1000 being decisive factors. Another way of looking at this is to see Late Iron Age trading places as points on the road towards early, partially spontaneous, urbanisation, while late tenth and eleventh century towns are viewed as being a completely new phenomenon, initiated by the monarchy and the Church, according to a western European model for the purpose of serving the interests of these two institutions (Callmer 1991, p. 30).

Definition of proto-town and town

The definition of a town must contain certain universal characteristics, while the town's description must be adapted to the historical and geographical context (Reynolds 1977, p. ixf., Skre 2007b, p. 46f., p. 454). The description of a town varies according to whether the period is the Late Iron Age/Viking Age or the Middle Ages (Krongaard Kristensen and Poulsen 2016, p. 13ff.). The basis for creation of a surplus production and possibly also a levy system may, as mentioned, have been established in villages as early as AD 600 (Hansen 2015), and the hint of a monarchy is perhaps discernible as early as the sixth century, although this possibility has been subject to intense debate (Näsman 1997, Christensen, T. 2015, p. 255ff.). It is more certain that the royal and, not least, ecclesial institutions of the Danish realm did not become consolidated until after the eleventh century. Both of them played a prominent role in the formation of urban environments (Christensen, T. 2015, p. 284). Even though there is a risk here of circular argument, it is obvious that both a town's functions and its background must be viewed differently, according to whether we assess it before or after the beginning of the eleventh century.

In addition to a requirement for the description of a town to be able to accommodate chronological developments, i.e. a dynamic, it is also

necessary to be aware that each urbanisation process has its own individual characteristics (Mogren 2005, p. 18, Von Carnap-Bornheim 2010, p. 113).

Even though, given the above-mentioned variations and chronological dynamics in the urbanisation processes, it can be problematic to operate with a list of definitive criteria that must be satisfied (Mogren 2005, p. 17), it is also necessary to have some form of basis for comparison. In the following, use will therefore be made of a, broadly speaking, bipartite model, which covers some relevant criteria for urbanisation in the period AD 700–1000, and also some extra criteria for the period subsequent to this. This bipartition corresponds to the two waves of urbanisation proposed by Skre (2007b). The empirical data are compared with the criteria and then a concluding summary analysis is presented in which local conditions are also incorporated. In this way, the intention is to arrive at an overall explanatory model for the earliest urbanisation at Odense and subsequent developments towards an established medieval town.

The following criteria, proposed by Olaf Olsen in 1975 and Susan Reynolds in 1977, and which also characterise Ribe, Kaupang and other emporia, will be examined for the period AD 700–1000 (Olsen 1975, Reynolds 1977, p. ixf.):

- Population density
- Permanent settlement of a certain size
- Majority of the population subsisting by trade and craft production

Olsen and Reynold's final point, that the locality is clearly delimited with respect to its surroundings, may possibly not be applicable to the proto-towns, but is probably a phenomenon that first turns up in the eleventh century (Sindbæk 2007, p. 129). An exception to this is though again seen in the emporia: For example, there was already a town ditch in Ribe as early as the first half of the ninth century (Feveile 2006, p. 41ff.). After AD 1000, it is also crucial for a town to contain two or more churches and have minting of coins and special taxation rules.

Odense's earliest layout and topography

The sources relating to Odense's earliest history are, as already mentioned, rather fragmentary. Several major developments undertaken in particular between the 1950s and 1970s, before a more comprehensive legislative protection of the archaeological remains came into force, mean that central parts of the town's earliest settlement layers have been removed and destroyed without prior archaeological investigation. Consequently, no large coherent areas have been subjected to investigation in the same way as, for example, the so-called market place in Viking Age Ribe (e.g. Feveile 2006). The data must therefore be patched together on the basis of a number of minor, scattered excavation trenches, together with the large area involved in the recent investigations at Thomas B. Thriges Gade. This naturally has consequences for the reliability of proposed hypotheses.

Further to this, the individual urban-diagnostic elements for the entire study period are dealt with collectively. To obtain a clearer picture of the dynamics of the developments during this broad time period, these elements will be assigned to three narrow chronological groups, which are presented below. Several localities cannot be dated so precisely, but extend across a couple of phases. Nevertheless, the tripartite division is maintained as it sketches some broad and striking developmental stages.

In the following the main elements of Odenses' earliest structure is presented. The analysis behind are given in the Appendix.

Phases

Phase 1 (c. AD 700–900) (Figure 12)

- The oldest traces of activity at the plateau at Nonnebakken is placed in the 7–9th centuries, with the aid of a Valkyrie brooch, a hilt from a sword and several AMS dates for material that *may* be related to the construction of the ring fortress – perhaps as a reflection of a fortress phase that preceded the actual Trelleborg-type fortress phase. The early dates can, as discussed in the commented catalogue, also relate in some way to a presumed sanctuary, the so-called Odins Vi, or other activities. Regardless of their precise explanation, the circumstances support the conclusion that the eastern Danish fortresses of Trelleborg type have a more complex buildings

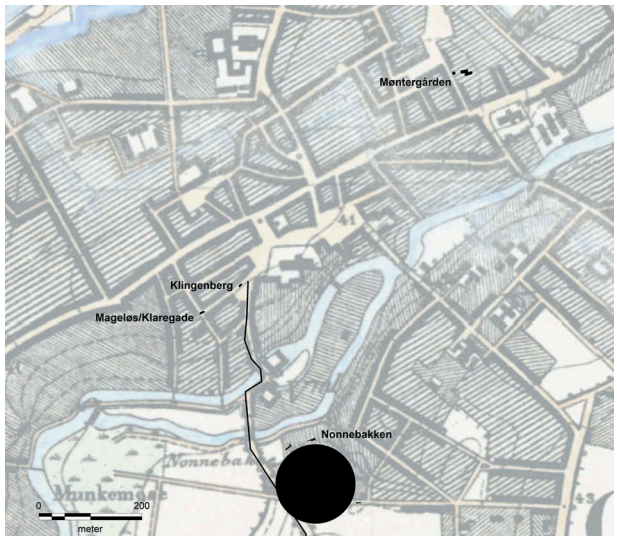

Figure 12. Phase 1 (c. AD 700–900). Marked on the first edition ordnance map from the second half of the nineteenth century. Background map: © *The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

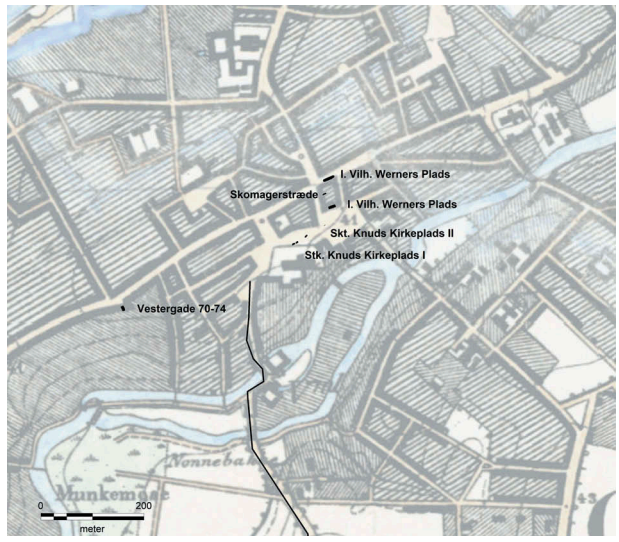

Figure 13. Phases 1–2 (c. AD 700–1000). Marked on the first edition ordnance map from the second half of the nineteenth century. Background map: © *The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

history, and roots extending further back in time, than the western examples of these monuments.

- Two pit-houses at Mageløs/Klaregade are dated on the basis of hemispherical vessels and other vessel forms, in conjunction with a couple of AMS dates, to the end of the Late Germanic Iron Age/Viking Age. Scattered posts near the pit-houses could derive from a coeval permanent settlement.
- A possible dwelling house at Klingenberg is dated on the basis of sherds of hemispherical vessels to the Late Germanic Iron Age/Early Viking Age.
- A pit at Møntergården, containing sherds of hemispherical vessels and Baltic ware pottery,[4] is dated to the end of the Late Germanic Iron Age or Viking Age. Two possible dwelling houses west of the pit can be assigned typologically to the Bronze Age or Iron Age; a third one is perhaps coeval with the pit. A four-poster structure appears, based on its relative position, to be most likely related to (one of) the longhouses. The locality probably lies to the northeast of Viking Age Odense.

Phases 1–2 (c. AD 700–1000) (Figure 13)

- A possible pit-house, together with a number of postholes that form the corner of a fence or a house at Skomagerstræde/Overgade 1–3, are overlain by a cobbled road, on which was found a ring-headed pin from the Late Viking Age.
- A minimum of two or three longhouses and a section of fence were identified at Skt Knuds Plads. The structures are stratigraphically earlier than the medieval graves but cannot be dated more precisely.
- The early phase of a pit-house at Vestergade 70–74 could be coeval with a stray find of a patrix dated to around AD 900. The later phase of the pit-house could be contemporaneous with a possible permanent dwelling house. This horizon is dated on the basis of the finds to the second half of the Viking Age or the Early Middle Ages. The area could have been in use during phases 1, 2 and possibly 3.
- A house or a fence, APC, at I. Vilhelm Werners Plads appears, based on AMS dates, to have been in use at some time during the period AD 777–991. Another house, ACU, probably has two phases. The first phase probably extends from the end of the ninth century until the middle of the tenth century, while the second, when the north wall was moved c. 0.75 m towards the north and a possible outshot is constructed, extends into the eleventh century. In addition to the two possible house structures, material from a pit is dated to AD 722–945.

Phase 2 (c. AD 900–1000) (Figures 14 and 15)

- At the end of the tenth century, Nonnebakken became an actual fortress of Trelleborg type. This conclusion is based on a series of AMS dates, a silver hoard buried within the fortress which contained a Carolongian coin minted in the period AD 940–985 and constructional similarities with the other fortresses of Trelleborg type. It is also further supported by evidence from several hoards and stray finds from the area. The extent to which Nonnebakken managed to function as a fortification during this period is unknown. The fortress could – if it actually did manage to become functional – also have accommodated the royal residence of the time.
- The discovery of three iron axes at Nonnebakken should possibly be viewed in the context of the Trelleborg-type fortress phase.
- The reference in Odense's so-called 'birth certificate' of the town having both a cathedral and a bishop in AD 988. It has not yet proved possible to demonstrate this archaeologically.
- At Vestergade 13–15, three cut-through floor layers were discovered, probably associated with dwelling houses. The floors have been AMS dated and fall within the period AD 897–1148.
- AMS dates for the possible house structure ATN at I. Vilhelm Werners Plads, together with a small sector of the finds assemblage, indicate that it was in use from the second half of the tenth century.

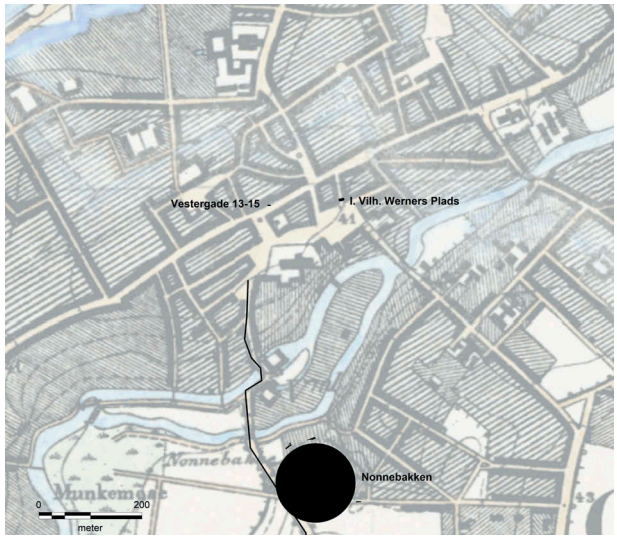

Figure 14. Phase 2 (c. AD 900–1000). Marked on the first edition ordnance map from the second half of the nineteenth century. Background map: © *The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

Phase 3 (c. AD 1000–1101) (Figure 16)

- A bone comb from disturbed fill at Filosofgangen 9–17 is dated to the eleventh century.

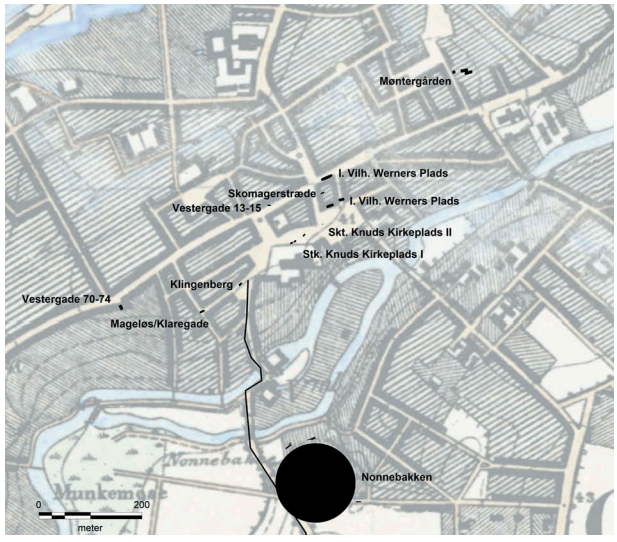

Figure 15. Phases 1, 1–2 and 2 together (c. AD 700–1000). Marked on the first edition ordnance map from the second half of the nineteenth century. Background map: © *The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

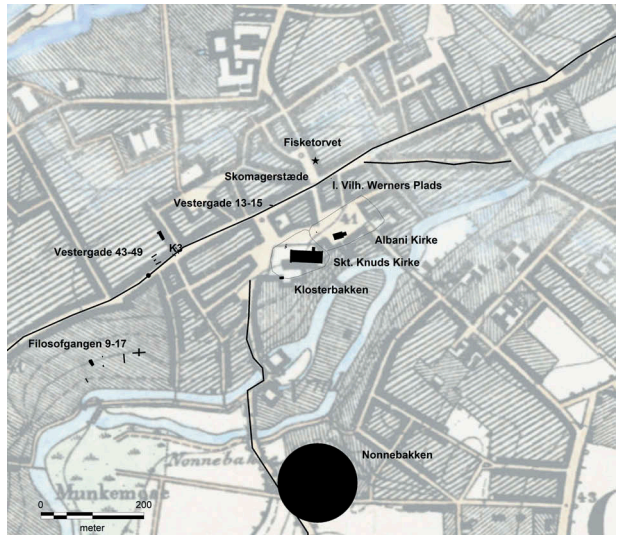

Figure 16. Phase 3 (c. AD 1000–1101). Marked on the first edition ordnance map from the second half of the nineteenth century. Background map: © *The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

- The western end of a three-aisled house at Klosterbakken is dated on the basis of Baltic ware pottery and travertine fragments to the eleventh or twelfth century.
- The earliest phase of St Canute's Church is constructed at the end of the eleventh century.
- St Alban's Church is probably built in the eleventh century. An AMS date for a grave that predates the church's latest wooden phase does not conflict with this conclusion. The discovery of a bishop's grave from the eleventh century in the earliest phase of the church means that St Alban's Church was already a cathedral at this time. Whether the church had an earlier phase, which can confirm the statement in Odense's so-called 'birth certificate' about the existence of a cathedral already in AD 988, is unknown. Based on written sources, there appears to have been a royal residence near St Alban's Church.
- A cluster of 13 graves in St Canute's churchyard is, based on the AMS dates, unlikely to be later than the end of the eleventh century. This conclusion is supported by an overlying layer of travertine fragments which is ascribed to the construction of St Canute's Church at the end of the eleventh century.
- During excavations on I. Vilhelm Werners Plads, the predecessors of the modern streets of Vestergade-Overgade were discovered. Their earliest phases are dated to the twelfth and perhaps even the eleventh century. A series of brooches from the second half of the eleventh–twelfth centuries were found in the cultural layers.
- At Vestergade 13–15, three cut-through floor layers were discovered, probably associated with dwelling houses. The floors have been AMS dated and fall within the period AD 897–1148.
- At Skomagergade/Vestergade 1–3, a series of floor layers was found in which there were a number of pits containing skulls and other skeletal elements, in particular of cats. The contents of the pits are interpreted as evidence of a cat farm or furriery. The pits are AMS dated to AD 1070 ± 100.
- A stray find from Fisketorvet of a perforated and ornamented stone is dated typologically to no earlier than the eleventh/twelfth century.
- Pits at Vestergade 43, 49 and 55 are dated on the basis of finds to c. AD 900–1100.

Summary of the phases

Phases 1 and 2, as is evident, encompass several localities that can be placed in both phases. The overall structure is also very uniform, with Nonnebakken located to the south of Odense Å, while crafts, and perhaps trade and dwellings, lie north of the river. As there is, nevertheless, a dynamic, for example in the development of Nonnebakken and the possibly dawning ecclesial aspect mentioned in the deed of gift from AD 988, the two phases will be examined separately in the following.

Apart from Nonnebakken, which lies south of the river, the structures in phase 1 constitute an east-west-oriented sequence extending over a c. 400 m stretch to the north of the relatively steep slope down towards Odense Å. The identified localities lie about 100 m apart. To the west is the pit-house area at Vestergade 70–74 and Mageløs/Klaregade. Between the pit-houses there may be permanent houses. In the eastern part of the area these appear to have been exclusively ordinary dwellings. The exception to this is a possible pit-house at Skomagerstræde/Overgade 1–3. Møntergården, which probably lies outside the Odense of the time, also belongs to phase 1. There are activities at Nonnebakken during this phase, but whether these are of a defensive character or should perhaps be ascribed to a possible ritual site – an Odins Vi – is uncertain. The location of the pit-houses at Vestergade and Mageløs/Klaregade, on a level plateau that is directly opposite Nonnebakken on the south side of the river, indicates the existence of links between these two phenomena. Both localities are oriented towards the place where the sides of the meltwater valley lie closest together, i.e. the most obvious and natural crossing point over Odense Å. This crossing corresponds to present-day Klaregade-Hunderupvej.

Nonnebakken is also the only locality south of the river in phase 2, and it is at this time it became transformed into an actual fortress of Trelleborg type, presumably at the behest of the king. It has been suggested that the Trelleborg-type fortresses could have a supplementary function as royal residences (Christensen 1988, p. 33, Olsen 2015,

p. 326). North of the river, approximately the same layout is apparent as in phase 1, i.e. structures oriented in an east-west sequence that now extends over a c. 500 m stretch of land immediately north of the relatively steep slope running down towards Odense Å. The existence of a possible cathedral, mentioned in the deed of gift from AD 988, has not yet been demonstrated archaeologically. As in phase 1, the pit-house area at Vestergade and Klaregade/Mageløs appears to be linked to Nonnebakken south of the river by a crossing over Odense Å.

A central discussion with regard to phases 1 and 2 is the relationship between Nonnebakken south of the river and the incipient town on the north side. Uncertainty about precise identification of the functions associated with the activities at Nonnebakken during phase 1, i.e. the centuries immediately prior to AD 1000, naturally complicates this discussion. But regardless of whether the activities reflect an earlier fortress phase, a sanctuary called Odins Vi or something else, there is very probably a link to the partially coeval activities on the north side of the river. Conversely, it cannot be determined whether one or the other came first, or whether the activities on each side of the river developed under mutual positive influences. As mentioned in the introduction, we must confine ourselves to the evidence showing that the location of the activities in this place has its foundation in a traffic and communicative hub, in the broadest sense of the term. In relation to phase 2, it seems more certain that Nonnebakken is established in a landscape that already enjoys a certain degree of importance, and where the proto-town becomes established. It seems obvious that the establishment of a large fortress immediately next to an incipient town would provide the latter with a boost.

In phase 3, Nonnebakken ceases to function as a fortress. The area is though probably still the property of the king, and both the AMS dates and the finds indicate activities at the site during this period. The establishment of a convent in the second half of the twelfth century, presumably on royal land, supports this conclusion. The picture is now dominated by the newly constructed churches, first St Alban's Church, followed later by St Canute's Church. With their associated churchyards, and possibly also a bishop's residence,[5] the ecclesial institutions occupy a significant proportion of the town. This is though, at present, still pure speculation. In phase 3, the various localities are, in general, located within a 6–700 m long and c. 200 m wide belt running east-west. A few of them have, accordingly, moved a little closer to the slope – defined by the 10 m contour – running down towards Odense Å, as well as further to the north. As the ecclesial area occupies a large part of the town's southern settlement area, it is obvious that the secular settlement, in the form of possible dwelling houses and potentially also workshops such as the cat farm/furriery at Skomagerstræde/Overgade 1–3, has, to a major extent, been moved northwards. The secular settlement now clusters predominantly around the street of Vestergade and its continuation into Overgade, which have now been established. The furriery at Skomagerstræde/Overgade 1–3 could perhaps be perceived as an indication of increased occupational specialisation with the aim of supplying a market that possibly encompassed more than the immediate hinterland.

The formation of Odense as a town and early urbanisation in southern Scandinavia

In the following, an overall assessment is undertaken of whether the tripartite urbanisation model is sustainable, i.e. whether, in the case of the foundation of Odense, we can speak of a bottom-up development prior to AD 1000. Significant parameters in this evaluation are: (1) Whether we can speak of a (proto-)town prior to AD 1000? (2) Whether the town was founded by a central power or had a bottom-up origin? (3) Whether there was any form of continuity from proto-town to medieval town or whether the earlier activities should simply be ascribed to agrarian settlement/seasonal craft and/or trade activities or something quite different? These three questions will be addressed for Odense in the following section. In the final section, an assessment will be undertaken of whether the model can be applied generally to other towns in southern Scandinavia.

When did Odense become a town?

The juxtaposition of the possible urbanisation factors in the three phases leaves us with the question of when the settlement that became Odense can be

termed a town? As described initially, the characteristics defining a town fall into two temporally distinct groups. For the period AD 700–1000, there is a requirement for the locality to have: (a) a certain population density, (b) a permanent settlement of a certain size and (c) the majority of the population subsisting by trade and crafts. From the eleventh century, the locality must also have a clearly defined boundary with respect to its surroundings, and it is equally crucial that it has two or more churches as well as coinage and special taxation rules. As already mentioned, several researchers have pointed out that the absence of a single criterion is not crucial to the determination of whether or not a locality can be defined as a town. A certain degree of flexibility is necessary with respect to the individual criteria.

In the evaluation of whether phases 1 and 2 satisfy the three criteria for early urbanisation, it is naturally challenging – particularly in relation to the aforementioned uncertainty regarding the contemporaneity of the structures at the individual localities – that the record from Odense is so fragmentary. This situation is not uncommon for Danish medieval towns, but should nevertheless be kept in mind when the evidential value is assessed with respect to future interpretation. Of course similar uncertainties apply to phase 3, too.

The first question to be clarified with respect to an evaluation of phases 1 and 2 is whether the aforementioned longhouses should be perceived as permanent buildings. And, similarly, whether such possible permanence can be extended to apply to the craft activities of the possible 'market place'. The dwelling houses in phases 1 and 2 are all post-built constructions with or without internal roof-bearing posts. They correspond to the structures that, in the agrarian settlements, are termed main houses in the farmsteads (Hansen 2015). There is therefore no reason to perceive the structures in Odense as anything other than permanent.

Another question is whether any form of trade took place in Odense in the centuries prior to AD 1000. As is discussed below, this is uncertain. At the same time, however, it is argued that a town like Odense has perhaps, in its earliest period, a local exchange of goods which, all things being equal, is difficult to detect in the archaeological record.

A third question relates to whether the specialised craft activities and potentially resulting trade activities in the pit-house area at Vestergade 70–74 and Mageløs/Klaregade were also permanent. In this respect, it is argued that the second phase of the pit-house and the possible dwelling house at Vestergade 70–74 may be coeval. Similarly, some of the postholes by the pit-houses at the Mageløs/Klaregade locality should perhaps be seen as indications of the same phenomenon. The small number of postholes render this interpretation uncertain. The close proximity of a longhouse and a possible pit-house at Skomagerstræde/Overgade 1–3 may be a third example of the linking together of crafts and permanent dwelling houses. This locality appears though to lie outside the craft production area that was identified around Mageløs/Klaregade and Vestergade 70–74.

The areal extent of Odense's two earliest phases is no greater than many coeval – and earlier – agrarian settlements, but a specific requirement for relative superiority in size is not included in the urban definition. Seen in relation to other contemporaneous towns, the extent of phases 1 and 2, i.e. c. 500 × 100 m not including the area over towards Nonnebakken, is quite large and not dissimilar to that of Ribe in the eighth and ninth centuries (Feveile 2006, p. 38, Figure 18, 41, Figure 20; Krongaard Kristensen and Poulsen 2016, p. 43). Other early urban localities, such as Birka (7 ha) and Kaupang (5.4 ha), also match very well. Haithabu, on the other hand, is remarkable with its 24 ha (Skre 2007c, p. 453). If the population density is examined in relation to for example Ribe in the eighth and ninth centuries, there does not appear to be any great deviation.

A further requirement in the definition of an early town is that the population must earn its living primarily by trade and craft production. As mentioned above, the composition of the finds assemblages from the pit-houses at Mageløs/Klaregade and Vestergade 70–74 is of an extent and a character that make it seem likely that these items were not exclusively intended for self-sufficiency. There are no other known indications that, in phases 1 and 2, the inhabitants subsisted primarily by craft production – and perhaps trade. On the other hand, there are no indications that the house remains uncovered here constituted

an agrarian settlement. Any way the fact that towns of the Viking Age and Middle Ages, as in later times (Hoff 2000, Elkjær 2001), had a certain element of agrarian activities is not surprising, and would certainly not be a unique feature of Odense. For example, it has been pointed out that around AD 1000 Lund had a substantial agrarian component, while trade and crafts had relatively limited significance (Nilsson 2015, p. 262).

With the conversion of Nonnebakken to a Trelleborg-type fortress in phase 2, the royal presence in Odense appears to have become a reality. Whether there also was a central power behind the earlier possible defensive activities in Nonnebakken's first phase cannot be ascertained, but it seems likely.

Overall, it appears that in phases 1 and 2 – with all the afore mentioned reservations for the fragmentary nature of the evidence – Odense can be termed a proto-town. Whether we consequently should add Odense to the list of Denmark's early towns is in many respects uncertain. First, we are unable to put a precise date on the establishment of the town. The present analyses merely indicate that a (proto-)town was established *at some time* between the end of the eighth century and AD 900. Second, there is much to indicate that the earliest urban phenomena were the emporia, which were generally placed on the edge of the realm with the intention of reaching out to a large market. Possibly only Ribe, Haithabu, Kaupang and Birka should be included under this category (Skre 2007c, p. 453f.). Neither the composition of the finds assemblages nor the location of Odense suggests the enormous trading activities and long-distance connections that can be recognised at the other localities.

Phase 3, in addition to the continued presence of the urban elements evident in phases 1 and 2, has two churches, traces of coinage and demarcation with respect to its surroundings in the form of both natural depressions and man-made water-filled ditches, possibly supplemented by a rampart and/or a palisade (Madsen 1988a), and is clearly an actual town. It is not possible, however, to ascertain whether it had special taxation rules.

Who founded Odense?

Previous analyses of the town's origins have highlighted that Odense first had the character of a town, or was possibly actually first founded as a town, after AD 1000, probably as part of Sweyn Forkbeard's establishment of some of the early bishoprics – including Roskilde, Lund and Viborg. Urbanisation is thereby linked to the king's takeover of central functions from nearby pagan centres and urbanisation thereby also acquired a function relative to the shift from paganism to Christianity. On the other hand, it is pointed out that these early towns were not established at trading hubs. However, it is shown in this study that the description of Odense's development is based on a relatively flimsy evidence base because of the limited empirical material available at the time (Ulriksen *et al.* 2014).

The founding of the earliest towns in Scandinavia, the emporia, has also traditionally been perceived as being influenced by a central power's need to organise trade and craft production. This applies for example to the description of Ribe's early phases. A more recent interpretation does, however, indicate that it may instead have been Frisian merchants who took the initiative to establish Ribe (Feveile 2006, p. 30f.). Ribe's consequent involvement in the Frisians' long-distance network has been highlighted as a basis for urban foundation there, and in the other emporia in southern Scandinavia. In this way, the emporia can, to some degree, be perceived as the central European centres' northernmost trading stations, rather than actual southern Scandinavian towns. This, in turn, questions the necessity of a controlling central power in the urbanisation process (Sindbæk 2007).

It has been demonstrated that, in the case of Odense, gradual development of a town was already taking place in the centuries preceding possible royal intervention. Its networks were probably of a more local or regional character and links with the hinterland were of greater importance than in the case of the emporia, where attention was focussed on the long-distance contacts instead. The demonstration by a recent study of the fixed location of Funen villages by as early as the 7th century AD is important in this respect as this development created the basis for a surplus production (Hansen 2015), prompting these villages to go from a relatively high degree of self-sufficiency to a situation where there was a need to find new outlets. The many metal-rich localities from the Late Iron Age could reflect an early fragmented version of this marketing

pattern. Over time, however, a certain degree of centralisation developed in the form of the proto-towns.

This shift could have had several tangible causes. It has previously been highlighted that the development from the Iron Age's metal-rich sites with evidence of trade and craft production to the towns of the Viking Age and Middle Ages, as new trade and craft centres, can be linked to the appearance of new trading routes and goods (Jensen 1990, Näsman 1990). A concrete illustration of a similar phenomenon is demonstrated by the development from the emporium of Haithabu to the market town of Schleswig (Rösch 2016). The detailed analysis of the finds and raw materials here can trace the continuity between the two localities in relation to everyday products and local raw materials, while a break between the two localities is seen in the imports of new raw materials and artefacts (Müller *et al.* 2014).

Consequently, the preconditions were created for a new trading centre, where the surplus production could be sold. This means, in turn, that the preconditions for an urban identity, whereby the population primarily earns its living via secondary occupations, were also present.

All in all, the evidence suggests first and foremost that, at the time when Harald Bluetooth established a ring fortress at Nonnebakken and later, when Sweyn Forkbeard made the town a bishopric, Odense already had a long history as a prototown and perhaps had a central position for the Northeastern-Funen area. There appear to have been functions associated with both specialised occupations and local exchange of goods, as well as a religious role of long duration. It is therefore difficult to see Odense as having been founded by a king.

On the contrary, Odense obtained its central importance due to its pivotal communicative significance – including in relation to religious and trade-related matters. In fact the historical main roads met at the spot where Odense to day is situated (Porsmose 1996, p. 201). At the same time, it seems likely that the presence of the king, and not least the Church, together with general societal developments and pan-European trends and tendencies meant that the town expanded and a great many new functions were added. This must, however, be seen simply as a phase in the town's development, not an expression of its starting point. In this respect, the many finds and functions have overshadowed earlier, less marked phases in Odense's development. The urbanisation of Odense was a dynamic process involving several actors and controlling processes that were both top-down (exogen) and bottom-up (endogen).

From proto-town to town – continuity or discontinuity?

On the basis of the above, it can be debated whether a connection can be traced between the proto-town, defined as phases 1 and 2, and the town proper, defined as phase 3. As outlined in the introduction, there is some controversy about the degree to which the early urbanisations were a locally developed phenomenon totally divorced from the later medieval royal urbanisations, as proposed by Callmer (1991, p. 30), or whether there was a link, a common developmental history, shared by the two phenomena. The question of continuity or discontinuity between proto-town and town is obviously crucial when the age of a town is to be determined and relates to a general research problem that has for example been addresses in the case of Ribe (Feveile 2006, p. 48ff., Alrø Jensen 2013, p. 20ff., Kleingärtner 2014, p. 235ff.).

The documentation of a fixation of the Funen villages already around AD 600 is also relevant in this context (Hansen 2015). It means that there was a continuity in the villages that extended across the introduction of Christianity and the institutional reinforcement of the monarchy. Moreover, it can be argued that several of the structures that have otherwise been linked to the appearance of a strong central power are perhaps of greater age. This applies for example to the aforementioned potential to create a surplus production and to establish a system of taxation and duties, both of which are factors supported by an established and fixed village pattern. It is then possible to see a long developmental history, in which the traditional perception of the sequence of monarchy, then village communality should perhaps be reversed. The permanent village structures and the resulting situation and conditions

surrounding taxes, duties and surplus production are more likely a prerequisite for the monarchy rather than a consequence of it.

Odense's phase 3, from the eleventh century onwards, with its established churches, appears to build itself on to the existing (proto-)town. St Alban's Church is, accordingly, sited on the eastern periphery of the proto-town, simply because it was here that there was space, i.e. in many ways a pragmatic solution and a situation that concurs well with the developments in the villages (Hansen 2015, p. 182ff.) (Figure 17). It was not until after the church had been established that a centre developed in this eastern part of the town centre. Later, St Canute's Church is added to this, in an area that appears to have been previously built on. Phase 3, the town proper, belongs then to the king and the Church and, as a consequence, marks top-down developmental stages. But these take place as a further development of an existing proto-town and not as a new initiative on virgin soil.

With the progression from a pagan proto-town in the western part of Odense and the addition of a Christian town to the east, established with the construction of St Alban's Church, Odense underwent a development at this point which corresponds to that seen in Ribe, Haithabu and Aarhus. On the contrary the development differs from the situation in Roskilde and Lund, which were established with a church and without any links with a previous trading and craft-production site (Krongaard Kristensen and Poulsen 2016, p. 59). It is unclear whether Viborg should be seen in the same context as the developments evident in Roskilde and Lund, or whether there was also continuity here from an existing proto-town, merely with displacement of the centre due to the addition of a church etc.

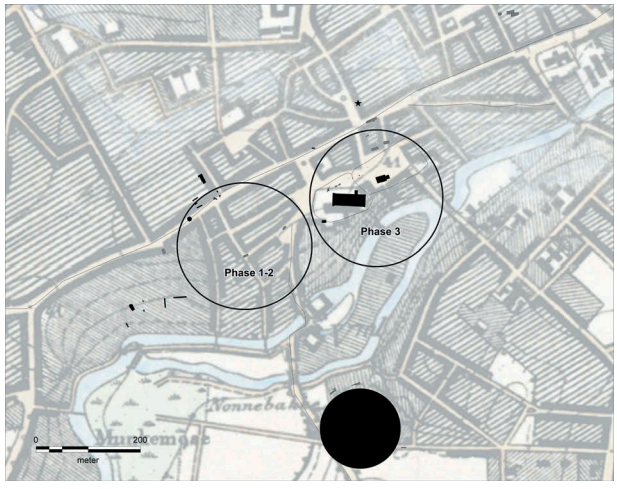

Figure 17. Displacement of the centre of Odense from phases 1–2 (dark grey) to 3 (black). Marked on the first edition ordnance map from the second half of the nineteenth century. Background map: © *The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

It has been pointed out that Roskilde, Lund and perhaps Viborg were founded by a Christian king in the vicinity of, but – at least in the case of Roskilde – also some distance away from a former pagan centre. The aim was, on the one hand, to mark a shift in power, and on the other, to benefit from the power structures that already existed in the area under pagan governance. In the case of Odense, the situation also appears to reflect a development whereby a Christian king took over central functions from a pagan centre, but the criterion with respect to maintaining a certain physical distance from the old centre seems not to apply. Perhaps the explanation here is that Odense's location was so strategically optimal that it made no sense to relocate (cf. also Callmer 1991, p. 30).

Summing up it can be concluded, that in Odense, there seems to be continuity from the proto-town, in phases 1 and 2, to the actual town, in phase 3. This development was apparently initiated by different factors and actors: During phases 1 and 2, trade and craft-related factors were responsible, and in phase 3, the dominance of the two actors, state and Church, was crucial.

A new perspective on the earliest urbanisation of southern Scandinavia

For a number of years, the earliest urbanisation of southern Scandinavia has been one of the core research questions in archaeology, and with the founding of the Centre for Urban Network Evolutions (UrbNet) at Aarhus University in 2015 it has become the subject of further attention at the present time. Nevertheless, there is still a tendency for urbanisation to be described in terms of some rather fixed and inflexible professional preconceptions and traditions. This is clearly evident from the fact that the date AD 1000 (or a few decades earlier) is often cited as the turning point in urbanisation. The general perception is that, prior to this

date, there were by and large no towns, as several urban phenomena were not present.

In southern Scandinavia, the date around AD 1000 is, quite simply, taken to be coincident with the transition from prehistory to the Middle Ages. This means that the written sources, most often dealing with noble families, and kings in particular, make their appearance from this date, and that Christianity is introduced as the religion, leading to the founding of new institutions: churches, monasteries etc. At the same time, the Church supports the monarchy and thereby helps define the king's position, both mentally and physically, in the urban space, and urban characteristics consequently become clearer and more numerous. These developments are supported by the fact that kings in southern Scandinavian, to some degree, model their behaviour and actions on western European urban patterns (Callmer 1991, p. 30, p. 42).

It is obvious that if the definition of a town is to be based on these factors, then no settlement predating AD 1000 – apart from emporia such as Ribe, Haithabu, Kaupang and Birka – will be able to meet these requirements. At the same time, these preconceptions and traditions have become so firmly rooted that in archaeological investigations of the existing town cores there might have been a tendency, presumably subconsciously, to seek their confirmation rather than looking for possible indications of earlier urban factors. In the case of Odense, this means that earlier urban characteristics, such as the pit-house settlement at Vestergade and Klaregade/Mageløs, have been interpreted as representing a separate and independent agrarian settlement (Nielsen 1984, Jacobsen 2001, Ulriksen *et al.* 2014, p. 173).

The simple bipartition of urban definitions employed here, which Johan Callmer, Dagfinn Skre and others have also argued in favour of, opens the way for a more contextual interpretation of the term 'town', and with that, a model whereby urban factors are perceived in relation to their actual time. As for the question of whether a place had the function of a town, the crux of the matter is whether, via its urban character, it stood out relative to other settlements of the time.

Odense's proto-town phases can therefore be seen as parallels to development in a group of other southern Scandinavian towns – e.g. Aarhus, Aalborg, Viborg, Horsens and perhaps Næstved – where, in the centuries prior to AD 1000, a number of urban characteristics are evident. These often take the form of pit-house areas with evidence of trade and craft production, as well as in some places traces of 'town ditches'. Another distinctive feature is that the urban characteristics at these early localities appear to occupy a different spatial location to the centre that grows up in the town in the eleventh century. It is possible that the spatial displacement of the centre here can be explained in terms of the introduction of Christianity and, with this, the construction of churches. These were built on the periphery of the established settlement and would therefore, over time, generate a new town centre.

Aarhus is mentioned in an imperial document from AD 948, but there is known to have been a ditch-enclosed settlement covering an area of 11 ha here already in the eighth–ninth century (Linaa 2016, p. 32f.). The character of the settlement is not described clearly in the literature, but at least from around AD 900 it appears to have been of considerable extent with both permanent houses and workshops/pithouses (Krongaard Kristensen and Poulsen 2016, p. 47; Linaa 2016, p. 33). It is unknown whether there was an actual town at this point (Krongaard Kristensen and Poulsen 2016, p. 48 with note 73). In the first half of the tenth century, the settlement was fortified and its area reduced slightly, and Aarhus is now considered to have been a town. The church was probably situated to the west of the fortifications (Krongaard Kristensen and Poulsen 2016, p. 47f., Linaa 2016, p. 32f., Linaa and Krants 2016).

Like Odense, Aalborg has traditionally been seen as being founded after AD 1000 (Roesdahl 1980, p. 91), but new investigations and analyses have shed light on the centuries prior to this time (Vrængmose Jensen 2017). Aalborg too has a relatively limited archaeological record. After an earliest ard-mark phase, a pithouse settlement appeared in the seventh, eighth and ninth centuries on the eastern side of the outflow of the river Østerå in Limfjorden. The pithouses are thought to represent one of several large metal-rich localities along the eastern and central Limfjord, and Aalborg is not considered to have been a town at this time. At the end of the ninth century, the

settlement was furnished with a bank and ditch and there was possibly parcelling-out of the trade and workshop area. The settlement was still primarily on the eastern side of Østerå, but it also expanded west of the river. The period up to c. AD 975 consequently had several urban characteristics. Subsequently, an actual town developed, with further urban elements including churches, and grew westwards. An early churchyard was established around AD 1000 close to, or on top of, the trading place. The associated church has not been identified archaeologically (Møller 2008, Vrængmose Jensen and Møller 2009, Vrængmose Jensen 2017, p. 77ff.).

Viborg is traditionally thought to have developed into a town around the eleventh century, at a location by Viborg Søndersø (Krongaard Kristensen 1998, Krongaard Kristensen and Poulsen 2016, p. 55ff.). But in the southwestern part of the town, in the area around Pederstræde, there was a settlement in several phases already from the eighth–ninth century, with both permanent houses and possible booths and workshops. The finds include traces of both bronze- and iron-working. In the most recent analyses, however, the settlement is perceived as being associated with a magnate's settlement based primarily on an agrarian economy. There are no traces of a church or a churchyard in either the Pederstræde quarter or the area by Viborg Søndersø (Levin Nielsen 1969, p. 49f., Krongaard Kristensen 1998, p. 349f., Krongaard Kristensen and Poulsen 2016, p. 57).

Horsens is believed to have first become an actual town in the twelfth century, but there was an earlier fortified site with pithouses already in the ninth–tenth century, and AMS dates from the ditch even extend as far back as the middle of the eighth century. The settlement was located in the same place as the later, larger medieval town. The churches stood to the west and southeast of the pithouse area (Schørring 2000, p. 118ff., Pagh 2016, p. 116, Krongaard Kristensen and Poulsen 2016, p. 38).

Næstved could have its foundations in a settlement which had roots extending back to the Late Iron Age and Viking Age, and which, in the latter period, appears to have been a trading site (Petersen 1988, Krongaard Kristensen and Poulsen 2016, p. 69). A form of continuity can be traced from the tenth century onwards. The church was established to the northeast of the earliest archaeological remains in the town (Andersen 1987, p. 51f.). Næstved is considered to have been an actual town by 1135, at the latest (Krongaard Kristensen and Poulsen 2016, p. 69).

This account of the history of establishment of these five towns is by no means exhaustive, as such a study lies beyond the scope of the present work. The aim here has been to focus attention on the fact that they all have traces of urban elements prior to AD 1000. These often extend back to the end of the eighth century, but at least from around AD 900 there appear to be relatively extensive urban features. The urban elements comprise pithouses (or the booths or workshops in Viborg), in combination with permanent settlement and delimitation of the settlement in the form of a ditch. Another characteristic is that the location of the early settlement is often displaced relative to the centre which emerged later in conjunction with a newly established church after AD 1000. A third common aspect is that finds from the centuries prior to AD 1000 are generally described as being relatively sparse and much less impressive than those in the emporia such as Ribe, Haithabu etc. from the eighth and ninth centuries. Structures and features too are generally said to be sparse and not as pronounced as after AD 1000. Finally, there is the continuity in the place-name evidence from Odense and Viborg, with the pagan roots in the names of these towns being retained following the transition to Christianity.

As is evident from the above, the traces from these towns prior to AD 1000 have, as in Odense, generally not been perceived as being urban in nature. It should, however, be considered whether this is due to variations in source material. The data material from the emporia thus is distinguishable from the contemporary non-urban localities with their very characteristic elements of 'exotica' in terms of artefacts, and their stringently structured market places. Similarly, the newly established towns from c. AD 1000 is distinguishable from the surroundings with their striking building works in the form of churches, large fortifications etc. In comparison, towns of the ninth and tenth centuries – except perhaps the fortified town of Aarhus from c. AD 900 – appear

much less conspicuous. Trade was probably locally or regionally based and perhaps comprised a larger element of organic materials than the emporia. Churches and other top-down established structures had not yet made their appearance.

The fragmentary character of the evidence from the centuries prior to AD 1000 in Odense and some of the other towns mentioned above make it difficult to link this period directly to the urban development from AD 1000 onwards. But an openness about the possibility of a continuous development should hopefully be evident from the above. The apparent hiatus in the finds and the sporadic archaeological record should perhaps not be interpreted as a break in development, but more an indication that towns from the ninth and tenth centuries cannot be expected to stand out and differ markedly from agrarian settlements. The finds associated with these early urban localities were not exotic, and neither were their buildings distinguishable from the house constructions of the agrarian settlements.

The background for the emergence of (proto-) towns in the centuries prior to AD 1000 is probably to be found in general societal changes and developments. A significant factor here is the shift in trading patterns, from a focus on southerly orientated networks, as expressed in the emporia from the eighth and ninth centuries, to the more local and northerly oriented networks that became increasingly dominant through the Viking Age (Jensen 1990, Näsman 1990, Alrø Jensen 2013, p. 20ff.). With time, this could have meant that the emporia had played out their role, while centres such as Odense etc., with a foundation in the local hinterland, emerged instead.

Another relevant factor is that, by the beginning of the Viking Age, the agrarian environment appears to have achieved a stable structure with a well-established village society and rigid organisation of landscape resources. With this came the basis for the creation of a surplus production, and a levy system was possibly established too. In rural settlements, new analyses suggest that a great settlement-historical shift took place around AD 600. After about AD 800, minor organisational adjustments were undertaken, including the splitting off of torp settlements. The latter appear, at least initially, to have related to the primary infrastructure (Hansen 2015, p. 123f.).

The more rigid system with exploitation of all, or at least very large parts of, the landscape, together with a greater focus on locally based trade, also means that a greater need could have arisen for dominance of the local infrastructure, perhaps especially the land-based traffic. This saw expression in the orientation of the torp settlements and metal-rich sites towards the general road net, as illustrated on the Royal Society's maps from the end of the eighteenth century; a road net that is thought to have its roots back in prehistory (Henriksen 2017, p. 25, p. 30). The locations of the proto-towns fit well into this system. This is certainly true of Odense – and also of Aalborg, Aarhus, Viborg, Horsens and perhaps Næstved.

Notes

1. http://museum.odense.dk/forskning/projekter/odenses-opstaaen/projektbeskrivelse. The project was primarily undertaken by the authors, funded by a grant from the Research Committee of the Ministry of Culture of Denmark. The manuscript was updated until the end of March 2018 and translated by Anne Bloch and David Earle Robinson, HSLS, Ebeltoft.
2. This article forms part of a current research-based focus on the earliest Odense and its hinterland which encompasses several projects. The first part comprised preliminary analyses of the metal-rich localities in Odense's hinterland and their relation to the town (Henriksen 2013). The second part is the present work, where the focus is on Odense itself. The third part is the large research project *From Central Space to Urban Place* (http://museum.odense.dk/forskning/projekter/from-central-space-to-urban-place), which runs from 2017 to 2020 and addresses Odense and Aalborg as case studies illuminating the transition from Late Iron Age central places to the towns of the Viking Age and Middle Ages. The fourth part comprises analyses of the development of the established town onwards in the research project *Urbaniseringens Møder og Mennesker* (http://museum.odense.dk/forskning/projekter/urbaniseringens-moeder-og-mennesker), which is being undertaken from 2016 to 2019, including the PhD project *Livet i byen – urbane praktikker, netværk og identitet i Odense i perioden 1100–1500* (http://museum.odense.dk/forskning/projekter/livet-i-byen). The projects have several mutual interfaces and will have a reciprocal influence. Despite this, it has been important to publish the results underway, well aware that the project *From Central Space to Urban Place* will for example address central questions with respect to the origin of Odense, not least the relationship between hinterland and town. A

thorough analysis of this aspect falls outside the scope of the present work.

3. While Odense's more sheltered location is clear in relation to the metal-rich sites, the picture is more blurred when a comparison is made with a locality such as Åsum, situated east of Odense. Åsum, by virtue of its location on a central forced route during the Iron Age and Middle Ages, also occupies a notably strategic position relative to terrestrial traffic (Henriksen 2002, p. 174ff.). Furthermore, the place name Åsum *could*, as will become evident, have a sacral meaning as 'home of the Ases', i.e. also a counterpart to Odense. But with a possible advantage relative to Odense in terms of the place name's relation to the main deity of the time? The primary difference between Odense and Åsum is perhaps their situation relative to water-based traffic. While it was not feasible to sail larger ships in to Odense, this was possible in to Åsum. Perhaps this rendered Åsum too exposed and vulnerable and its role therefore became more that of a landing place?.
4. The presence of Baltic ware pottery in southern Scandinavia is typically dated to a period extending from the tenth century to AD 1250/1300. Moreover, it can be divided into an early, soft-fired, relatively coarse variant, which includes the so-called Menkendorf type, and a later, harder fired, thinner variant. The early variant is dated earlier than AD 950–1050, and the late variant has a broad dating frame of 1000–1300 (Madsen 1991, p. 224ff., Roslund 2001, p. 231ff., Langkilde 2007, p. 26f., Madsen and Sindbæk 2014, p. 280ff.). But in the area immediately to the south of Denmark and southern Scandinavia, however, Baltic ware pottery appears as early as the eighth century (Meier 1994, p. 145, Roslund 2001, p. 91). It can in the authors opinion therefore not be ruled out that an earlier date of the Baltic Ware pottery could also be the case in Southern Scandinavia.
5. The earliest known episcopal residence in Odense lies to the east of the contemporaneous St Alban's Church and is dated, on the basis of two dendrochronological dates for oak wood from a well located north of the main building for the present Odense Adelige Jomfrukloster (OBM 137, 080407–152), to after AD 1293 (dendro.dk, report no. 27, 2011). It is unknown how far back in time a possible earlier phase of the episcopal residence can be followed (Jakob Tue Christensen: oral communication).
6. It could be considered whether the term 'Trelleborg-type fortress' should be used exclusively in reference to Aggersborg, Fyrkat and Trelleborg on Zealand, as these are the only sites that satisfy all the defining criteria for this type of structure. Another possibility is to make a distinction between ring fortresses and circle fortresses, with the latter term applied to geometrically exact structures (Svanberg and Söderberg 1999, p. 59). In the following, the Trelleborg term will be used in reference to all the ring fortress structures with an active period around AD 980, i.e. in the reign of Harald Bluetooth. They must also be located in the Danish realm of that time, have dimensions commensurate with the classic Trelleborg-type fortresses and, in their outer fortifications, have a corresponding construction to the latter. The presence of axial roads and buildings grouped uniformly in fours around a quadrangle – i.e. a 'square' or 'squares', has been omitted from the definition, as these features are not crucial to the structure's function as an element in Harald Bluetooth's overall system of defences. The latter also included other major coeval building works such as the rampart around Aarhus, Danevirke, the Jelling complex and the bridge across Ravning Enge (Roesdahl and Sindbæk 2014b, p. 443ff.).
7. The latest tree ring on the piece of wood was formed in AD 956, resulting in the felling date being determined as after AD 967 (Jensen and Sørensen 1990, p. 329, cf. Sønderby 1989, p. 244). In theory, the tree could have been felled later and could perhaps be totally unrelated to the fortress. Another piece of wood from the ditch takes the form of an oak-wood spade. The last tree ring formed on the spade is from AD 882 and the tree could have been felled in c. AD 900 at the earliest, but this could also have taken place later. Due to their finds circumstances, the relationship of these pieces of wood to the time when the fortress was constructed is uncertain.
8. Skovmand (1942) does not mention the two pieces of hack silver, the association of which to the coins does however appear certain. These pieces are illustrated in Moesgård (2015, Figure IV, 9–10).
9. Identification of the dirham fragment was undertaken by René Laursen, Bornholm Museum, and Tobias Bondesson, Malmö, Sweden.
10. Information on the *pfennig* kindly provided by Jens Christian Moesgaard of the National Museum of Denmark. See also: http://www.sachsenpfennig.de/tpk_kn.html (accessed 02.01.17).
11. Four other iron axes, three working axes and a battle-axe with brass inlays (OBM5337; 080407–271), have previously been ascribed to Nonnebakken (Grandt-Nielsen 1982, p. 173f.). They were discovered in 1908, during digging works along the southern bank of the now filled-in northern arm of Odense Å, about 1 m below the riverbed. The axes were found spread over a distance of 10 ft, between the demolished mill, Munke Mølle, and the bridge Klaregadebroen. Whether they represent votive finds or lost objects – for example from a toolbox – cannot be determined on the basis of the available evidence. The axes date from the Early Middle Ages and therefore cannot be directly related to the Viking Age activities at Nonnebakken.
12. On Mikkelsens collection, see Albrectsen (1941).

13. As these lines are written the conservation is ongoing. The determination of the ornamentation type is thus not known. The classification is made on the basis of observations of the hilt in this state of conservation and with important input from Anne Pedersen, The Danish National Museum. Anne Pedersen has only seen the x-ray photos of the hilt.
14. During the 2015 investigation, it was possible to demonstrate that on the actual spot there was up to 2 m of soil – presumably made ground – on top of the surface inside the fortress. Consequently, sieving of the soil layers was neither realistic nor appropriate. Sieving of the lower parts was also not seen as a priority, as it was not possible to identify a primary horizon. On the other hand, the lowermost parts of the deposits above subsoil level were excavated in several layers and scanned with a metal detector. Similarly, fill excavated from the features was sieved. None of these initiatives yielded many finds.
15. Laboratory numbers Poz-78622–78630, 78632, 79881–79882, 80425–80428.
16. From the same feature, there is a date of 58,269–40,298 BC. This date must be for contaminated material, for example percolating oil.
17. From the same feature, there is a date of 47,890 BC (68.2%) 47,344 BC. This date must be for contaminated material, for example percolating oil.
18. Laboratory number Poz-83167.
19. Laboratory numbers Poz-83214, 83283–83285.
20. Laboratory numbers Poz-98125–98128, 98130, 98380, 98381, 98383.
21. At Borgring, there does not, as yet, appear to be earlier fortress phases, and here too the fortress forms a perfect circle (Jonas Christensen, Museum Southeast Denmark: oral communication).
22. Laboratory number Poz-73229.
23. Laboratory numbers Poz-72419, 72420.
24. Laboratory numbers Poz-98680, 98681, 98789.
25. Already in a letter of 18 February 1985, Anemette S. Christensen draws the excavators' attention to the fact that the locality should not necessarily be ascribed to the possible village of Heden, but could just as well be ascribed to Odense (unpublished correspondence).
26. K-1887 (Hatting 1992, p. 179).
27. A discussion of the possibility of demonstrating short-distance networks in the archaeological record was for example raised at the seminar: *Towns as meeting places – exploring urban encounters, networks and people in Northern Europe 1000–1700 AD*, 13.-14.10.16 at Aarhus University.
28. In Anemette S. Christensen's letter of 18 February 1985 to the excavators, the question is similarly asked whether 'plough marks' actually means 'ard marks' (unpublished correspondence).
29. Laboratory numbers AAR-14651-14653.
30. Kirstine Haase is thanked for information on the investigation.
31. Laboratory numbers Poz-73169-73173, 73306, 73174–73176, 73178, 73205, 73207–73215, 73217–73225, 73227–73230, 73307, 73231–73233, 73235–73239.
32. Laboratory number Poz-73237.
33. Laboratory numbers Poz-73205, 73207, 73208, 73209.
34. Laboratory number Poz-73172.
35. Laboratory numbers Poz-73173, 73175, 73232, 73300.
36. In the Middle Ages, Odense contains a number of ecclesial institutions, but as these are later than the study period (Christensen 1988, p. 94ff.), they have been omitted.
37. Odense also to day houses a Sct. Alban's Church. This church was founded in 1906 and located c. hundred meters east of the ruins of the first Sct. Alban's Church.
38. Work is presently in progress to separate inclusions of charred organic material from mould fragments from the pit to obtain an AMS date.
39. For the complex argumentation on the relation between the bishop's grave and the oldest wooden phase of the church (see Christensen and Hansen 2017, p. 14–15).
40. Laboratory number AAR-23976.
41. Laboratory number Poz-72618.
42. It is suggested that the church had also an earliest wooden phase (Krogh 2001, p. 100). This has not, however, been found, and it would also fit poorly with the proposed model of the construction of a travertine church following the murder of Canute IV.
43. Laboratory numbers Poz-72615–72616, 72619–72620.

References

Ægidius, J.P., 1977. *Knytlinge Saga. Knud den Store, Knud den Hellige deres mænd, deres slægt*. Oversat af J.P. Ægidius med indledning og noter ved H. Bekker-Nielsen and O. Widding. København: Gad.

Albrectsen, E., 1941. Apoteker Helweg Mikkelsens Samling. *Fynske Årbøger*, Bd. 1 (1939-41), 466–478.

Albrectsen, E., 1970. Vikingetidens Odense. *Fynske Minder*, 1970, 121–132.

Albrectsen, E., 1984. *Ælnoths Krønike*. Oversat og kommenteret af Erling Albrectsen. Efterskrift af Preben Meulengracht Sørensen. Odense: Odense Universitetsforlag.

Alrø Jensen, M., 2013. Udgravningerne i Sct. Nicolais Gade. Nyt om Ribes markedsplads i det 9. og 10. århundrede. *By, Marsk Og Geest*, 25, 9–27.

Andersen, A., 1987. *Middelalderbyen Næstved*. Aarhus: Forlaget Centrum.

Andersen, H., 1998. Vier og lunde. *Skalk*, 1998 (1), 15–27.

Andersen, H.H., Crabb, P.J., and Madsen, H.J., 1971. *Århus Søndervold – en byarkæologisk undersøgelse*. København: Nordisk Forlag.

Andersson, H., 1972. Zentralorte, Ortschaften und Städte in Skandinavien. Einige methodische Probleme. *In*: H. Hinz, ed. *Kiel Papers, 72. Frühe Städte im Ostseeraum.*

Symposium des Sonderforschungsbereichs 17 "Skandinavien und Ostseeraumforschung", Christian-Albrechts-Universität Kiel, 8. bis 10. Mai 1972. Kiel: Karl Wachholtz, 23–31.

Andrén, A., 1985. *Den urbana scenen. Städer och samhälle i det medeltida Danmark*. Malmö: CWK Gleerup, Liber.

Andrén, A., 1994. State and Towns in the Middle Ages: the Scandinavian Experience. *In*: C. Tilly and W.P. Blockmans, eds. *Cities and the Rise of States in Europe, A.D. 1000 to 1800*. Boulder, San Fransisco, Oxford: Westview Press, 28–149.

Anglert, M. and Jansson, P., 2001. Kyrkplatsen i Uppåkra – undersökningarna 1997-1999. *In*: L. Larsson, ed. *Uppåkra – centrum i analys och rapport*. Uppåkrastudier 4. Acta Archaeologica Lundensia. Series in 8°, No. 36, Papers of the Lunds Universitets Historiska Museum. Lund: Almqvist & Wiksell, 23–40.

Arentoft, E., 1984. *Vestergade 70–74. Bebyggelse fra vikingetid og tidlig middelalder*. Unpublished excavation report. Odense Bys Museer.

Arentoft, E., 1985. Sankt Albani Kirke. *In*: E. Arentoft, V. Brandt, and F. Grandt-Nielsen, eds. *Albani Kirke og Torv*. Fynske Studier, 14. Odense: Odense Bys Museer, 7–60.

Arentoft, E., 1993. I vikingernes vold. *Fynske Minder*, 1993, 117–141.

Arentoft, E., 1999. *De spedalskes hospital. Udgravning af Sankt Jørgensgården i Odense*. Fynske Studier 18. Odense: Odense Bys Museer.

Baastrup, M.P., 2009. Småfibler af karolingiske og ottonske typer i Danmark. *Aarbøger for Nordisk Oldkyndighed Og Historie*, 2005, 209–255.

Baastrup, M.P., 2012. *Kommunikation, kulturmøde og kulturel identitet – tingenes rejse i Skandinaviens vikingetid*. Thesis (PhD). Københavns Universitet, København.

Baastrup, M.P., 2014. Continental and insular imports in Viking Age Denmark – on transcultural competences, actor networks and high-cultural differentiation. *In*: H.C. Gulløv, ed.. *Northern Worlds – landscapes, interaction and dynamics. Research at the National Museum of Denmark. Proceedings of the Northern Worlds Conference. Copenhagen 28-30 november 2012*. PNM. Papers from the National Museum. Studies in Archaeology and History, vol. 22. København: Odense University Press of Southern Denmark, 353–367.

Bartholin, T.S., 1977. Absolut dendrokronologisk datering af de tre brønde fra det ældste Odense. *Fynske Minder*, 1976, 33–34.

Bartholin, T.S. and Grandt-Nielsen, F., 1974. Datering af tre brønde fra det ældste Odense. *Fynske Minder*, 1974, 155–167.

Becker, C.J., 1982. Odense som møntsted i den sene vikingetid. *Fynske Minder*, 1982, 43–60.

Berglund, J., 1982. Kirkebjerget – A late bronze age settlement at voldtofte, South-West Funen. An interim report on the excavations of 1976 and 1977. *Journal of Danish Archaeology*, 1, 51–63.

Bertelsen, L.G., 1992. Præsentation af Ålborg-gruppen – en gruppe dyrefibler uden dyreslyng. *Aarbøger for Nordisk Oldkyndighed Og Historie*, 1991, 237–264.

Bertelsen, L.G., 1994. Urnesfibler i Danmark. *Aarbøger for Nordisk Oldkyndighed Og Historie*, 1992, 345–370.

Binderup, M., 1996. Det fynske landskabs tilblivelse. *In*: O. Crumlin-Pedersen, E. Porsmose, and H. Thrane, eds. *Atlas over Fyns kyst i jernalder, vikingetid og middelalder*. Odense: Odense Universitetsforlag, 23–32.

Bjerregaard, M.M., Christensen, J.T., and Hansen, J., 2016a. Bispen i Albani Kirke. *Odense Bys Museer*, 2016, 140–155.

Bjerregaard, M.M., Christensen, J.T., and Hansen, J., 2016b. Tidlig bispegrav i Odense. *Skalk*, 2016 (5), 3–9.

Bjerregaard, M.M. and Runge, M., 2017. En by bliver til – hovedtræk af Odenses udvikling i vikingetid og middelalder. *In*: M. Runge and J. Hansen, eds. *Knuds Odense – vikingernes by*. Odense: Odense Bys Museer, 6–21.

Callmer, J., 1991. Platser med anknytning till handel och hantverk i yngre järnålder. Exempler från södra Sverige. *In*: P. Mortensen and B. Rasmussen, eds. *Fra Stamme til Stat i Danmark 2. Høvdingesamfund og Kongemagt*. Jysk Arkæologisk Selskabs Skrifter XXXII:2. Aarhus: Jysk Arkæologisk Selskab, 29–47.

Childe, V.G., 1950. The urban revolution. *Town Planning Review*, 21 (1, Apr), 3–17. doi:10.3828/tpr.21.1.k853061t614q42qh

Christensen, A.S., 1988. *Middelalderbyen Odense*. Aarhus: Centrum.

Christensen, C.A. and Nielsen, H., 1975. *Danmarks Riges Breve. 1. række, 1. bind. 789-1052*. Udgivet af Det Danske Sprog- og Litteraturselskab under ledelse af Frantz Blatt. København: C.A. Reitzels Boghandel.

Christensen, C.A. and Nielsen, H., 1977. *Danmarks Riges Breve. 1. række, 3. bind. Breve 1170-1199 og Abbed Vilhelms brevsamling*. Udgivet af Det Danske Sprog- og Litteraturselskab under ledelse af Frantz Blatt. København: C.A. Reitzels Boghandel.

Christensen, J., *et al*., 2015. Borgring – en nyopdaget vikingeborg ved Køge. *Museum Sydøstdanmark. Årbog*, 2015, 8–19.

Christensen, J.T., 1999. Døden skiller – om kirkegårdsskel og -skik under Skt. Knuds Plads. *Fynske Minder*, 1999, 83–92.

Christensen, J.T. and Hansen, J., 2017. Graven og manden i domkirken i Skt. Albani Odense – en kilde til overleveringen af 1000-tallets bispehistorie. *In*: M. Bjerregaard and M. Runge, eds. *At være i centrum. Magt og minde – højstatusbegravelser i udvalgte centre 950–1450*. Kulturhistoriske studier i centralitet – Archaeological & Historical Studies in Centrality, vol. 1, 2017. Forskningscenter Centrum – Odense Bys Museer. Odense: University Press of Southern Denmark. 10–27.

Christensen, L.E., 2014a. Gamle landsbyer i Odense – stednavne som kulturarv. *Odense Bys Museer*, 2014, 181–193.

Christensen, L.E., 2014b. Stednavne, centralpladser og vækstcentre – om tolkningsforslag og betydningsrelationer. *In*: B. Eggert, P. Gammeltoft, and R.S. Olesen, eds. *På sporet. Festskrift til Bent Jørgensen på 70-årsdagen den 12. marts 2014*. København: Museum Tuscelanums Forlag, 79–89.

Christensen, L.E., 2015a. *Stednavnet „Heden" nær Odense*. Unpublished report. Odense Bys Museer.

Christensen, L.E., 2016. Centralpladsrelevante stednavne og centrale pladser på Fyn – nye fund og mulige strukturer. *In*: M.S. Danielsen, B. Eggert, and J.G.G. Jakobsen, eds. *Navn og navnebærer. Rapport fra NORNAs 45. Symposium i Skagen 1.-4. oktober 2014*. NORNA-rapporter 93. Uppsala: Norna, 7–33.

Christensen, S.B., 2004. De danske middelalderbyers fremkomst, udvikling og udforskning – et bud på nogle hovedlinjer. *In*: S.B. Christensen, ed. *Middelalderbyen*. Danske Bystudier, 1. Aarhus: Dansk Center for Byhistorie, 13–61.

Christensen, T., 2015b. *Lejre bag myten. De arkæologiske udgravninger*. Jysk Arkæologisk Selskabs Skrifter 87. Aarhus: Jysk Arkæologisk Selskab.

Croix, S., 2015. Permanency in early medieval emporia: reassessing ribe. *European Journal of Archaeology*, 18 (3), 497–522. doi:10.1179/1461957114Y.0000000078

Crumlin-Pedersen, O., 1991. Ship Types and Sizes. *In*: O. Crumlin-Pedersen, ed. *Aspects of Maritime Scandinavia AD 200-1200*. Roskilde: Vikingeskibshallen, 69–82.

Crumlin-Pedersen, O., 1996. Kystforsvaret. *In*: O. Crumlin-Pedersen, E. Porsmose, and H. Thrane, eds. *Atlas over Fyns kyst i jernalder, vikingetid og middelalder*. Odense: Odense Universitetsforlag, 182–193.

Crumlin-Pedersen, O., Porsmose, E., and Thrane, H., eds., 1996. *Atlas over Fyns kyst i jernalder, vikingetid og middelalder*. Odense: Odense Universitetsforlag.

Dobat, A.S., 2014. Lokaliteternes forhistorie og oplandet. *In*: A.S. Dobat, ed. *Kongens Borge. Rapport over undersøgelserne 2007–2010*. Jysk Arkæologisk Selskabs Skrifter 76. Aarhus: Jysk Arkæologisk Selskab, 53–56.

Elkjær, T.L., 2001. Købstadslandbrugets betydning for købstadens erhversvliv og økonomi i 1700- og 1800-tallet. *Fortid Og Nutid*, December 2001, 251–272.

Fanning, T., 1990. *Die bronzenen Ringkopfnadeln aus der Ausgrabung im Hafen von Haithabu. Berichte über die Ausgrabungen in Haithabu*. Bericht 27. Das Archaeologische Fundmaterial. Neumünster: Wachholtz.

Feveile, C., 2006. *Ribe Studier. Det ældste Ribe. Udgravninger på nordsiden af Ribe Å 1984–2000*. Bind 1.1 og 1.2. Jysk Arkæologisk Selskabs Skrifter 51. Aarhus: Jysk Arkæologisk Selskab.

Feveile, C., 2016. Understanding the Hinterland of the ladby ship grave. *In*: V.E. Turner, O.A. Owen, and D.J. Waugh, eds. *Shetland and the viking world. Papers from the proceedings of the seventeenth Viking Congress, Lerwick*. Glasgow: Shetland Heritage Publications, 229–235.

Feveile, C., 2018. Nordøstfyn – fra ingen til mange metalrige pladser på få år. *In*: T. Lemm and V. Hilberg, eds. *Viele Funde – große Bedeutung? Potenzial und Aussagewert von Metalldetektorfunden für die siedlungsarchäologische Forschung der Wikingerzeit*. Schriften des Museums für Archäologie Schloss Gottorf, Ergänzungsreihe, Band 12, Bericht des 33. Tværfaglige Vikingesymposiums 9. Mai 2014, Wikinger Museum Haithabu. Kiel: Verlag Ludwig, 29–48.

Füssel, S., ed., 2008. *Georg Braun and Franz Hogenberg. Cities of the world*. Complete Edition of the colour plates of 1572-1617. Köln: Taschen.

Fyns Amt, 1992. Heden. Landsbyregistrering *In*: Fyns Amt, ed. *Historiske forhold. Ringe Kommune. Fyns Amtskommune. Udvalget for teknik og miljø*. 1983. 2. oplag 1992. Odense: Fyns Amt, 53–63.

Goodchild, H., Holm, N., and Sindbæk, S.M., 2017. Borgring: the discovery of a Viking Age ring fortress. *Antiquity*, 91 (358), 1027–1042. doi:10.15184/aqy.2017.118

Gøthche, M., 1995. Båden fra Gislinge. *Nationalmuseets Arbejdsmark*, 1995, 185–198.

Grandt-Nielsen, F., 1972. Nyt fra Knud den Helliges Odense. *Fynske Minder*, 1971, 199–216.

Grandt-Nielsen, F., 1982. Arkæologiske iagttagelser ca. 1000-1200. *In*: H. Thrane, *et al.*, eds. *Fra boplads til bispeby. Odense til 1559*. Odense Bys Historie bind 1. Odense: Odense Kommune, 160–175.

Hansen, G., 2008. Konger og folk i det eldste Bergen – byoppkomst i et aktørperspektiv. *In*: H. Andersson, G. Hansen, and I. Øye, eds. *De første 200 årene – nytt blikk på 27 skandinaviske middelalderbyer*. UBAS. Universitetet i Bergen Arkæologiske Skrifter. Bergen: Institutt for Arkeologi, Historie, Kulturvitenskap og Religion, Universitetet i Bergen, 15–39.

Hansen, J., 2015. *Landsbydannelse og bebyggelsesstruktur i det 1. årtusinde – et bebyggelseshistorisk regionalstudie*. Thesis (PhD). Syddansk Universitet, Odense.

Hansen, J., 2017. Fynske landsbyer fra arilds tid. *In*: H. Plechinger, *et al.*, eds. *Museumsleder, forsker og netværksskaber. Torben Grøngaard Jeppesen. 40 år ved Odense Bys Museer*. Odense: Odense Bys Museer, 168–179.

Harnow, H., 2005. *Odense havn og kanal gennem 200 år*. Odense: Odense Bys Museer.

Hatting, T., 1992. Cats from Viking Age Odense. *Journal of Danish Archaeology*, 9, 179–193.

Haupt, N., 2006. Nye bestemmelser af gamle fund – de kufiske mønter fra de to skattefund fra Nonnebakken i Odense. *Nordisk Numismatisk Unions Medlemsblad*, 2006 (2), 51–56.

Henrichsen, C.L., 1968. *Adam af Bremen. De hamburgske ærkebispers historie og Nordens beskrivelse*. Oversat af Carsten L. Henrichsen. København: Rosenkilde og Bagger.

Henriksen, M.B., 1997. Vikinger ved Helnæsbugten. *Fynske Minder*, 1997, 25–58.

Henriksen, M.B., 2000. Lundsgård, Seden Syd og Hjulby - tre fynske bopladsområder med detektorfund. *In*: M.B. Henriksen, ed. *Detektorfund – hvad skal vi med dem? Dokumentation og registrering af bopladser med detektorfund fra jernalder og middelalder. Rapport fra et bebyggelseshistorisk seminar på Hollufgård den 26. oktober 1988*. Skrifter fra Odense Bys Museer vol. 5. Odense: Odense Bys Museer, 17–60.

Henriksen, M.B., 2002. Er Hjulby Nyborgs forgænger? *Fynske Minder*, 2002, 155–185.

Henriksen, M.B., 2009. *Brudager Mark – en romertidsgravplads nær Gudme på Sydøstfyn*. Bind 1-2. Fynske

Jernaldergrave bd. 6, 1-2. Fynske Studier 22. Odense: Odense Bys Museer.

Henriksen, M.B., 2010. Gold deposits in the Late Roman and Migration Period landscape – a case study from the island of Funen (Fyn), Denmark. *In*: U.L. Hansen and A. Bitner-Wróblewska, eds. *Worlds apart? Contacts across the Baltic Sea in the iron age. Network Denmark-Poland, 2005–2008*. Nordiske Fortidsminder Serie C, volume 7. København: Det Kongelige Nordiske Oldskriftselskab Warszawa: Państwowe Muzeum Archeologiczne, 389–432.

Henriksen, M.B., 2012. Krig og konflikt i Fyns oldtid. *Fynske Årbøger*, 2012, 52–79.

Henriksen, M.B., 2013. Odenses forgænger – eller: én af mange? *In*: L. Bisgaard, M. Bruus, and P. Gammeltoft, eds. *Beretning fra det toogtredivte tværfaglige vikingesymposium*. Højbjerg: Wormianum, 68–83.

Henriksen, M.B., 2016. *Odenses opståen. En gennemgang af udvalgte jordfundne genstandsgrupper fra Odense købstad med henblik på at eftervise spor af aktiviteter i sen jernalder og vikingetid*. Arkæologisk Rapport nr. 527. Unpublished report. Odense Bys Museer.

Henriksen, M.B., 2017. Odenses naboer – metalrige bopladser vest og øst for Odense Fjord. *In*: M. Runge and J. Hansen, eds. *Knuds Odense – vikingernes by*. Odense: Odense Bys Museer, 24–33.

Henriksen, M.B. and Horsnæs, H.W., 2015. Problems associated with the interpretation of metal-detector finds from the plough soil. *In*: L. Larsson, *et al*., eds. *Small things – wide Horizons. Studies in honour of Birgitta Hårdh*. Oxford: Archaeopress Archaeology, 237–244.

Henriksen, M.B. and Petersen, P.V., 2013. Valkyriefund. *Skalk*, 2013 (2), 3–10.

Hodges, R., 1982. *Dark age economies. The Origins of towns and trade A.D. 600-1000*. London: Duckworth Publishers.

Hoff, A., 2000. Byens bønder. *In*: C. Bjørn and B. Fonnesbech-Wulff, eds. *Mark og menneske. Studier i Danmarks historie 1500–1800*. Tilegnet Karl-Erik Frandsen. Ebeltoft: Skippershoved, 217–231.

Hohenberg, P.M. and Lees, L.H., 1985. *The making of urban europe 1000–1950*. Cambridge, MA: Harvard University Press.

Hohenberg, P.M. and Lees, L.H., 1995. *The making of urban europe 1000–1994*. Cambridge, MA: Harvard University Press.

Højlund Nielsen, K., 1987. Zur Chronologie der jüngeren germanischenEisenzeit auf Bornholm. Untersuchungen zu Schmuckgarnituren. *Acta Archaeologica*, 57, 47–86.

Holst, M.K., 2014. Warrior aristocracy and village community: two fundamental forms of social organization in the Late Iron Age and Viking Age. *In*: E. Stidsing, K.H. Nielsen, and R. Fiedel, eds. *Wealth and Complexity. Economically specialized sites in Late Iron Age Denmark*. Aarhus: Aarhus University Press. Randers: East Jutland Museum, 179–198.

Jacobsen, J.A., 2000, Apr. Asgot med det røde skjold. *In*: S. Hvass and D.A. Nævn, eds. *Vor skjulte kulturarv. Arkæologien under overfladen*. Til Hendes Majestæt Dronning Margrethe II 16. Esbjerg: Det Kongelige Nordiske Oldskriftselskab and Jysk Arkæologisk Selskab.

Jacobsen, J.A., 2001. *Fynske jernalderbopladser. Bind 2. Odense herred*. Skrifter fra Odense Bys Muser. Vols. 1,2. Odense: Odense Bys Museer.

Jacobsson, B., 1999. *Trelleborgen i Trelleborg: förhistoriska boplatslämningar och gravar, vikingatida ringborg och medeltida bebyggelselämningar: skåne, Trelleborg, kv Gröningen, kv Kråkvinkeln, Bryggaregatan och Svenstorpsgatan*. Lund: Riksantikvarieämbetet.

Jacobsson, B., 2003. Trelleborg and the southern plain during the iron age. A study of a coastal area in South-West Scania, Sweden. *In*: L. Larsson and B. Hårdh, eds. *Centrality – regionality. The social structure of Southern Sweden during the iron age*. Uppåkrastudier 7. Lund: Almqvist & Wiksell, 191–221.

Jansson, I., 1984. Kleine Rundspangen. *In*: G. Arwidsson, ed. *Birka II:1. Systematische Analysen der Gräberfunde*. Stockholm: Almqvist & Wiksell, 58–74.

Jansson, I., 1985. *Ovala spännbucklor. En studie av vikingatida standardsmycken med utgångspunkt från Björkö-fynden*. Uppsala: Archaeological Studies.

Jensen, J.E., 1992. *Danmarks middelalderlige byplaner. Fyn med omliggende øer. Dansk komité for byhistorie*. Herning: Odense Universitetsforlag.

Jensen, N.M. and Sørensen, J., 1990. Nonnebakkeanlægget i Odense. En ny brik til udforskningen. *Kuml*, 1988/89, 325–333.

Jensen, S., 1990. Handel med dagligvarer i vikingetiden. *Hikuin*, 16, 119–138.

Jeppesen, T.G., 1981. *Middelalderlandsbyens opståen. Kontinuitet og brud i den fynske agrarbebyggelse mellem yngre jernalder og tidlig middelalder*. Fynske Studier XI. Odense: Odense Bys Museer.

Johannsen, B.B. and Johannsen, H., 1995. *Danmarks Kirker IX. Odense Amt, 1. bind*. Herning: Poul Kristensens Forlag.

Johannsen, B.B., *et al*., 1998–2001.*Danmarks Kirker IX, Odense Amt, 3. bind*. Herning: Poul Kristensens Forlag.

Jørgensen, L., 2009. Pre-Christian cult at aristocratic residences and settlement complexes in southern Scandinavia in the 3rd-10th centuries AD. *In*: U.V. Freeden, H. Friesinger, and E. Wamers, eds. *Glaube, Kult und Herrschaft. Phänomene des Religiösen im 1. Jahrtausend n.Chr. in Mittel- und Nordeuropa. Akten des 59. Internationalen Sachsensymposions und der Grundprobleme derfrühgeschichtlichen Entwicklung im Mitteldonauraum*. Bonn: Habelt, 329–354.

Jørgensen, L., 2014. Norse religion and religious sites in Scandinavia in the 6th–11th century. *In*: K.P. Hofmann, H. Kamp, and M. Wemhoff, eds. *Die Wikinger und das Fränkische Reich. Identitäten zwischen Konfrontation und Annäherung*. Mittelalterstudien des Instituts zur Interdisciplinären Erforschung des Mittelalters und seines Nachwirkens. Band 29. Paderborn: Wilhelm Fink, 239–264.

Jørgensen, L., *et al*., 2014. Førkristne kultpladser – ritualer og tro i yngre jernalder og vikingetid. *Nationalmuseets Arbejdsmark*, 2014, 186–199.

Jørgensen, M.S., 1988. Vej, vejstrøg og vejspærring. *In*: P. Mortensen and B.M. Rasmussen, eds. *Fra Stamme til Stat i*

Danmark 2. Høvdingesamfund og Kongemagt. Jysk Arkæologisk Selskabs Skrifter XXII:2. Aarhus: Jysk Arkæologisk Selskab, 101–116.

Jørgensen, O., 1981. *Otonium i Urbium praecipuarum mundi theatrum quintum, auctore Georgio Braunio Agrippinate. Odense 1593 In: georg Braun and Frans Hogenberg: civitates orbis terrarum, V. del (Köln 1597), blad 30*. Indledning og kommentarer af Ove Jørgensen. Odense: Odense Universitetsforlag.

Juel, C., 2010. *OBM8935 Hjulby (kampagne 2009), Nyborg Landsogn. Arkæologisk udgravning af værkstedsplads med grubehuse og kulturlag fra yngre germansk jernalder-tidlig middelalder samt bebyggelse fra yngre jernalder*. Arkæologisk Rapport nr. 308. Unpublished report. Odense Bys Museer.

Kalmring, S., 2010. *Der Hafen von Haithabu*. Die Ausgrabungen in Haithabu. Band 14. Neumünster: Wachholtz.

Kalmring, S., 2016. Early northern towns as special economic zones. *In*: L. Holmquist, S. Kalmring, and C. Hedestierna-Jonson, eds. *New aspects on Viking-age Urbanism c. AD 750-1100. Proceedings of the International Symposium at the Swedish History Museum, April 17–20th 2013*. Theses and Papers in Archaeology B:12. Stockholm: Archaeological Research Laboratory, Stockholm University, 11–21.

Kieffer-Olsen, J., 1993. *Grav og gravskik i det middelalderlige Danmark – 8 kirkegårdsudgravninger*. Thesis (PhD). Aarhus Universitet.

Kleingärtner, S., 2014. *Die frühe Phase der Urbanisierung an der südlichen Ostseeküste im ersten nachchristlichen Jahrtausend*. Studien zur Siedlungsgeschichte und Archäologie der Ostseegebiete. Neumünster: Wachholtz.

Kousgård Sørensen, J., 1969. *Danmarks Stednavne nr. 14. Odense Amts bebyggelsesnavne*. Udgivet af Stednavneudvalget, Institut for navneforskning. København: Akademisk forlag.

Krogh, M.G., 2001. Udgravningerne på Klingenberg. *Fynske Minder*, 2001, 97–113.

Krongaard Kristensen, H., 1998. Viborgs topografiske udvikling i middelalderen 1000-1300. *In*: J. Hjermind, M. Iversen, and H. Krongaard Kristensen, eds. *Viborg Søndesø 1000-1300. Byarkæologiske undersøgelser 1981 og 1984–85*. Viborg Stiftsmuseums skriftrække bind 2. Jysk Arkæologisk Selskabs Skrifter XXXIV. Århus: Jysk Arkæologisk Selskab, 349–358.

Krongaard Kristensen, H. and Poulsen, B., 2016. *Danmarks byer i middelalderen*. Aarhus: Aarhus Universitetsforlag.

Langkilde, J., 2007. *Middelalderkeramik fra Næstved – en undersøgelse og vurdering af keramik som kilde til socialtopografi*. Unpublished thesis (master). Københavns: Universitet, Saxo-institutet.

Larsson, L. and Lenntorp, K.-M., 2004. The enigmatic house. *In*: L. Larsson, ed. *Continuity for centuries. A ceremonial building and its context at Uppåkra, southern Sweden*. Uppåkrastudier 10. Acta Archaeologica Lundensia. Series in 8°, No. 48. Lund: Almqvist & Wiksell, 3–48.

Lauritsen, A., 1974. Volden omkring vikingetidens Odense. *Fynske Minder*, 1974, 140–154.

Lauritsen, J., 1873. *Søvejene til Odense, især den nuværende med stadigt Henblik på denne Bys Skibsfart og Handel*. Odense: Dreyer.

Levin Nielsen, E., 1969. Pederstræde i Viborg. Købstadsarkæologiske undersøgelser i 1966/67. *Kuml*, 1968, 23–81.

Linaa, J., 2016. Introduction. *In*: J. Linaa, eds. *Urban consumption. Tracing urbanity in the archaeological record of Aarhus c. AD 800–1800*. Jysk Arkæologisk Selskabs Skrifter 94. Aarhus: Jysk Arkæologisk Selskab, 11–35.

Linaa, J. and Krants, L., 2016. Stages 1-2: the earliest Aarhus c. AD 700–1050. *In*: J. Linaa, ed. *Urban consumption. Tracing urbanity in the archaeological record of Aarhus c. AD 800–1800*. Jysk Arkæologisk Selskabs Skrifter 94. Aarhus: Jysk Arkæologisk Selskab, 163–165.

Lindblom, C., 2014. Jelling – fund og kulturlandskab i det lokale område. *In*: H. Lyngstrøm and L.C.A. Sonne, eds. *Vikingetidens aristokratiske miljøer*. Tekster fra et seminar i seed-money netværket Vikingetid i Danmark, Saxo-instituttet, Københavns Universitet den 29. november 2013. København: Seed-money netværket Vikingetid i Danmark, 21–30.

Lønborg, B., 1994. Masseproduktion af urnesfibler!. *Aarbøger for Nordisk Oldkyndighed Og Historie*, 1992, 371–378.

Lund Hansen, U., 1988. Hovedproblemer i romersk og germansk jernalders kronologi i Skandinavien og på kontinentet. *In*: P. Mortensen and B.M. Rasmussen, eds. *Fra Stamme til Stat i Danmark. 1. Jernalderens stammesamfund*. Jysk Arkæologisk Selskabs Skrifter XXII. Aarhus: Jysk Arkæologisk Selskab, 21–35.

Lundø, L.B., 2012. *At være eller ikke være … En trelleborg? En bearbejdning af samtlige udgravningskampagner ved Nonnebakken på Fyn*. Bind 1 og 2. Unpublished thesis (master). Københavns Universitet, Saxo-institutet.

Lundø, L.B., 2013. Nonnebakken – en ringborg i Odense. *In*: H. Lyngstrøm and L.G. Thomsen, eds. *Vikingetid i Danmark*. Københavns Universitet, Saxo-Instituttet: Seed-money netværket Vikingetid i Danmark, 203–206.

Madsen, H.J., 1991. Vikingetidens keramik som historisk kilde. *In*: P. Mortensen and B.M. Rasmussen, eds. *Fra Stamme til Stat i Danmark 2. Høvdingesamfund og Kongemagt*. Jysk Arkæologisk Selskabs Skrifter XXII:2. Aarhus: Jysk Arkæologisk Selskab, 217–234.

Madsen, H.J. and Sindbæk, S.M., 2014. Keramik. *In*: E. Roesdahl, S.M. Sindbæk, and A. Pedersen, eds. *Aggersborg i vikingetiden. Bebyggelsen og borgen*. Jysk Arkæologisk Selskabs Skrifter 81. Aarhus: Jysk Arkæologisk Selskab, 266–286.

Madsen, P.K., 1982. Keramik fra en udgravning i Ribes vestby – import, lokalkronologi og datering. *Hikuin*, 8, 77–94.

Madsen, P.K., 1988a. Byen nord for åen. Befæstning og møller. *In*: A.S. Christensen, ed. *Middelalderbyen Odense*. Aarhus: Centrum, 34–47.

Madsen, P.K., 1988b. De gejstlige institutioner i og ved Odense. *In*: A.S. Christensen, ed. *Middelalderbyen Odense*. Aarhus: Centrum, 97–118.

Mathiesen, H., 1922. *Torv og Hærstræde*. København: Gyldendal.

Mathiesen, H., 1927. *Middelalderlige byer. Beliggenhed og baggrund*. København: Gyldendal.

Meier, D., 1994. *Die wikingerzeitliche Siedlung von Kosel (Kosel-West), Kreis Rendsburg/Eckernförde*. OFFA-Bücher Band 76. Neumünster: Wachholtz.

Mejdahl, V., 1993. Prøveudtagning. Luminiscens-datering. *In*: Rigsantikvarens Arkæologiske Sekretariat, ed. *Arkæologisk Felthåndbog*. Afsnit N6. Viborg: Museumstjenesten.

Moesgård, J.C., 2015. *King Harold's Cross Coinage. Christian Coins for the Merchants of Haithabu and the King's Soldiers*. Gylling: The National Museum of Denmark University Press of Southern Denmark. Publications from the National Museum. Studies in Archaeology & History Vol. 20:2 Jelling Series.

Mogren, M., 2005. Den långa medeltiden. *In*: M. Mogren, ed. *Byarnas böndar. Medeltida samhällsförändring i Västskåne*. Lund: Riksantikvarieämbetet, 8–33.

Møller, S.B., 2008. Aalborgs ældste tid – perioden ca. 900-1200. *In*: H. Andersson, G. Hansen, and I. Øye, eds. *De første 200 årene – nytt blikk på 27 skandinaviske middelalderbyer*. UBAS. Universitetet i Bergen. Arkæologiske Skrifter. Bergen: Institutt for Arkeologi, Historie, Kulturvitenskap og Religion, Universitetet i Bergen, 195–214.

Müller, U., Rösch, F., and Schimmer, M., 2014. Von Haitabu nach Schleswig. Aktuelle Forschungen zur Gründung einer Metropole zwischen Wikinger- und Hansazeit. *In*: A. Diener, ed. *Gründung im archäologischen Befund. Sitzung der Gesellschaft in Lübeck vom 2. bis 4. September 2013*. Mitteilungen der Deutschen Gesellschaft für Archäologie des Mittelalters und der Neuzeit 27. Paderborn: Deutsche Gesellschaft für Archäologie des Mittelalters und der Neuzeit, 25–36.

Näsman, U., 1990. Om fjärrhandel i Sydskandinaviens yngre järnålder. Handel med glas under germansk järnålder och vikingatid. *Hikuin*, 16, 89–118.

Näsman, U., 1991a. Det syvende århundrede – et mørkt tidsrum i ny belysning. *In*: P. Mortensen and B.M. Rasmussen, eds. *Fra Stamme til Stat i Danmark 2. Høvdingesamfund og Kongemagt*. Jysk Arkæologisk Selskabs Skrifter XXII:2. Aarhus: Jysk Arkæologisk Selskab, 165–178.

Näsman, U., 1991b. Grav og økse. Mammen og den danske vikingetids våbengrave. *In*: M. Iversen, ed. *Mammen. Grav, kunst og samfund i vikingetid*. Viborg Stiftsmuseums række bind 1. Jysk Arkæologisk Selskabs Skrifter XXVIII. Aarhus: Jysk Arkæologisk Selskab, 163–180.

Näsman, U., 1997. Från Region til Rike – från Stam til Stat. Om danernas etnogenes och om den danska riksbildningen. *In*: J.F. Krøger, ed. *Rikssamlingen. Høvdingemakt og kongemakt. Karmøyseminaret 1996*. Stavanger: Karmøyseminaret, 46–65.

Nielsen, J., 1984. *Prøvegravninger mellem Filosofgangen og Vestergade. Skt. Knuds Sogn, Odense By. Diverse spor af middelalderlig bebyggelse*. Unpublished excavation report. Odense Bys Museer.

Nielsen, J., 1998. Odenses ældste gader. De tidligste gader under udgravninger i middelalderbyen Odense. *Fynske Minder*, 1998, 27–38.

Nilsen, L.C., 1990. Trelleborg. *Aarbøger for Nordisk Oldkyndighed Og Historie*, 1990, 105–178.

Nilsson, I.-M., 2015. The relationship between Uppåkra and Lund – a status update. *In*: L. Larsson, *et al*., eds. *Small Things – wide Horizons. Studies in Honour of Birgitta Hårdh*. Oxford: Archaeopress Archaeology, 261–266.

Nørgaard Jørgensen, A., 2002. Naval Bases in Southern Scandinavia from the 7th to the 12th Century. *In*: A.N. Jørgensen, *et al*., eds. *Maritime Warfare in Northern Europe. Technology, organization, logistics and administration 500 BC-1500 AD*. Publications from the National Museum. Studies in Archaeology and History, 6. København: Schweitzer, 125–152.

Nørlund, P., 1948. *Trelleborg*. Nordiske Fortidsminder Bind IV, 1. Hefte. Det Kgl. Nordiske Oldskriftselskab, København: Gyldendal.

Nyberg, T., 1982. Knud den Hellige og Erik Ejegod, 1080–1104. *In*: H. Thrane, *et al*., eds. *Fra boplads til bispeby. Odense til 1559*. Odense: Odense Kommune, 114–159.

Ödman, A., 2014. The trelleborg constructors. *In*: L. Larsson, *et al*., eds. *Small Things – wide Horizons. Studies in Honour of Birgitta Hårdh*. Oxford: Archaeopress Archaeology, 267–272.

Olesen, C.R., 2014. *Fundrapport. Thomas B. Thriges Gadeundersøgelserne OBM 3179, OBM8280, OBM 9776*. Unpublished report. Odense Bys Museer.

Olesen, M.B., 2000. Trelleborg eller ej? – om den skånske trelleborgs tilknytning til de danske ringborge. *Kuml*, 2000, 91–111.

Olsen, O., 1975. *Vi. Kulturhistorisk Leksikon for Nordisk Middelalder fra vikingetid til reformasjonstid, vol. 19*. København: Rosenkilde og Bagger, 684–685.

Olsen, O., 1977. Borgen. *In*: O. Olsen and H. Schmidt, eds. *Fyrkat. En jysk vikingeborg. I. Borgen og bebyggelsen*. Nordiske fortidsminder, Serie B – in 1quarto: bind 3. København: Det Kongelige Nordiske Oldskriftselskab, 9–104.

Olsen, O., 2009. *Nonnebakken. Nationalmuseets udgravninger 1968, 1969 og 1971*. Unpublished Excavation report. Odense Bys Museer.

Olsen, O., 2015. Anmeldelse af "Else Roesdahl, Søren M. Sindbæk and Anne Pedersen eds. Aggersborg i vikingetiden. Bebyggelsen og borgen. *Kuml*, 2015, 323–327.

Olsen, O. and Schmidt, H., 1977. *Fyrkat. En jysk vikingeborg. I. Borgen og bebyggelsen*. Nordiske fortidsminder, Serie B – in 1quarto: bind 3. København: Det Kongelige Nordiske Oldskriftselskab.

Ørsnes, M., 1966. *Form og stil i Sydskandinaviens yngre germanske jernalder*. Nationalmuseets Skrifter. Arkæologisk-historisk række XI. København: Nationalmuseet.

Pagh, L., 2016. Tamdrup. Kongsgård og mindekirke i nyt lys. *Kuml*, 2016, 81–129.

Pedersen, A. and Roesdahl, E., 2014. Genstandsfund. Indledning. *In*: E. Roesdahl, S.M. Sindbæk, and A. Pedersen, eds. *Aggersborg i vikingetiden. Bebyggelsen og borgen*. Jysk Arkæologisk Selskabs Skrifter 81. Aarhus: Jysk Arkæologisk Selskab, 261–262.

Pedersen, K. and Bjerregaard, M., 2016. Sygdom, død og begravelse på Albani Kirkegård. Observationer fra en

igangværende arkæologisk udgravning. *Bibliotek for Læger*, 2016 (208. årgang), 158–176.

Petersen, J., 1919. *De norske vikingesverd. En typologisk-kronologisk studie over vikingetidens vaaben*. Videnskapsselskapets Skrifter II. Hist.Filos. Klasse 1919. No. 1. Kristiania: Dybwad.

Petersen, J.E., 1988. Farvergade i Næstved. Arkæologiske fund fra germansk jernalder og middelalder. *Aarbøger for Nordisk Oldkyndighed Og Historie*, 1987, 171–209.

Petersen, P.V., 2005. Odins fugle, valkyrier og bersærker – billeder fra nordisk mytologi fundet med metaldetektor. *In*: T. Capelle and C. Fischer, eds. *Ragnarok. Odins Verden*. Silkeborg: Silkeborg Museum, 57–86.

Petersen, P.V., 2010. Valkyrier og bersærker. Mytologien i smykkekunsten. *In*: M. Andersen and P.O. Nielsen, eds. *Danefæ. Skatte fra den danske muld*. Til Hendes Majestæt Dronning Margrethe 2. København: Gyldendal, 134–138.

Porsmose, E., 1996. Veje, færger og sejruter. *In*: O. Crumlin-Pedersen, E. Porsmose, and H. Thrane, eds. *Atlas over Fyns kyst i jernalder, vikingetid og middelalder*. Odense: Odense Universitetsforlag, 201–203.

Poulsen, T.G., 2016. De danske udmøntninger under Svend Estridsens sønner 1074–1134. *Aarbøger for Nordisk Oldkyndighed Og Historie*, 2015, 117–221.

Randsborg, K., 1980. *The Viking Age in Denmark. The formation of a state*. London: Duckworth.

Reynolds, S., 1977. *An introduction to the history of english medieval towns*. Oxford: Clarendon Press.

Riis, N., *et al*., 1999. *Odense Å – et vandløb under stadig forandring*. Odense: Fyns Amt.

Rindel, P.O., 2002. Regional settlement patterns and central places on late iron age Zealand. *In*: B. Hårdh and L. Larsson, eds. *Central places of the migration and merovingian periods. Papers from the 52nd Sachsensymposium, Lund, August 2001*. Uppåkra Studier 6. Stockholm: Almqvist & Wiksell International, 185–196.

Roesdahl, E., 1977. *Fyrkat. En jysk vikingeborg. II. Oldsagerne og gravpladsen*. Nordiske fortidsminder, Serie B – in 1quarto: bind 4. København: Det Kongelige Nordiske Oldskriftselskab.

Roesdahl, E., 1980. *Danmarks vikingetid*. København: Gyldendal.

Roesdahl, E., 2016. The unification process of the Danish Kingdom – and the Danish Husebyer and their owners. *In*: L.E. Christensen, T. Lemm, and A. Pedersen, eds. *Husebyer – status quo, open questions and perspectives*. Papers from a workshop at the National Museum. Copenhagen 19–20 March 2014. Publications from the National Museum. Studies in Archaeology and History, Jelling Series, v. 20: 3. København: Nationalmuseet, 175–182.

Roesdahl, E. and Sindbæk, S.M., 2014a. Aggersborgs datering. *In*: E. Roesdahl, S.M. Sindbæk, and A. Pedersen, eds. *Aggersborg i vikingetiden. Bebyggelsen og borgen*. Jysk Arkæologisk Selskabs Skrifter 81. Aarhus: Jysk Arkæologisk Selskab, 251–260.

Roesdahl, E. and Sindbæk, S.M., 2014b. Borgens formål. *In*: E. Roesdahl, S.M. Sindbæk, and A. Pedersen, eds. *Aggersborg i vikingetiden. Bebyggelsen og borgen*. Jysk Arkæologisk Selskabs Skrifter 81. Aarhus: Jysk Arkæologisk Selskab, 435–464.

Rösch, F., 2016. The Schleswig waterfront – a Place of major significance for the emergence of the town. *In*: L. Holmquist, S. Kalmring, and C. Hedestierna-Jonson, eds. *New aspects on viking-age Urbanism c. AD 750-1100. Proceedings of the International Symposium at the Swedish History Museum, April 17-20th 2013*. Theses and Papers in Archaeology B:12. Stockholm: Archaeological Research Laboratory, Stockholm University, 159–172.

Roslund, M., 2001. *Gäster i huset – kulturell överföring mellan slaver och skandinaver 900–1300*. Skrifter utgivna av Vetenskaps-societeten i Lund, nr. 92. Lund: Vetenskapssocieteten i Lund.

Runge, M., 2009. *Nr. Hedegård. En nordjysk byhøj fra ældre jernalder*. Nordjyllands Historiske Museum and Jysk Arkæologisk Selskabs Skrifter 66. Aarhus: Jysk Arkæologisk Selskab.

Runge, M., 2016. Byens transformationer. *Odense Bys Museer*, 2016, 26–39.

Runge, M., 2017. Det tidligste Odense. *In*: M. Runge and J. Hansen, eds. *Knuds Odense – vikingernes by*. Odense: Odense Bys Museer, 42–55.

Runge, M., in press. New archaeological investigations at Nonnebakken, a Viking Age fortress in Odense. *In*: J. Hansen and M. Bruus, eds. *Beretning fra det seksogtredivte tværfaglige vikingesymposium*.

Runge, M., Hansen, J., and Lundø, L.B., 2016. Nye undersøgelser på Nonnebakken i Odense. *Skalk*, 2016 (6), 3–9.

Sanke, M., 2001. Gelbe Irdenware. *In*: H. Lüdtke and K. Schietzel, eds. *Handbuch zur Mittelalterlichen Keramik in Nordeuropa, bd. I-III*. Neumünster: Wachholtz, 271–428.

Schørring, O., 2000. En middelalderby forandrer sig – hovedresultater fra ti års udgravninger i Horsens. *Kuml*, 2000, 113–149.

Sindbæk, S.M., 2007. Networks and nodal points: the emergence of towns in early Viking Age Scandinavia. *Antiquity*, 81, 119–132. doi:10.1017/S0003598X00094886

Sindbæk, S.M., 2008. Kulturelle forskelle, sociale netværk og regionalitet i vikingetidens arkæologi. *Hikuin*, 35, 63–84.

Sindbæk, S.M., 2014a. Aggersborg og andre borge. *In*: E. Roesdahl, S.M. Sindbæk, and A. Pedersen, eds. *Aggersborg i vikingetiden. Bebyggelsen og borgen*. Jysk Arkæologisk Selskabs Skrifter 81. Aarhus: Jysk Arkæologisk Selskab, 233–250.

Sindbæk, S.M., 2014b. Genstandsfund og borgens funktion. *In*: E. Roesdahl, S.M. Sindbæk, and A. Pedersen, eds. *Aggersborg i vikingetiden. Bebyggelsen og borgen*. Jysk Arkæologisk Selskabs Skrifter 81. Aarhus: Jysk Arkæologisk Selskab, 227–228.

Sindbæk, S.M., 2014c. Landbebyggelsen. *In*: E. Roesdahl, S.M. Sindbæk, and A. Pedersen, eds. *Aggersborg i vikingetiden. Bebyggelsen og borgen*. Jysk Arkæologisk Selskabs Skrifter 81. Aarhus: Jysk Arkæologisk Selskab, 103–184.

Skaarup, J., 1997. *Ærøs Sankt Alberts – kirke og fæstning*. Meddelelser fra Langelands Museum. Rudkøbing: Langelands Museum.

Skaarup, J., 2005. *Øhavets middelalderlige borge og voldsteder*. Rudkøbing: Langelands Museum.

Skibsted Klæsøe, I., 1999. Vikingetidens kronologi – en nybearbejdning af det arkæologiske materiale. *Aarbøger for Nordisk Oldkyndighed Og Historie*, 1997, 89–142.

Skovmand, R., 1942. *De danske Skattefund fra Vikingetiden og den ældste Middelalder indtil omkring 1150. Aarbøger for Nordisk Oldkyndighed og Historie*, 1942. København: Det Kongelige Nordiske Oldskriftselskab.

Skre, D., 2007a. Post-substantivist Towns and Trade AD 600-1100. *In*: D. Skre, ed. *Means of exchange. Dealing with silver in the Viking Age*. Kaupang Excavation Project. Publication Series, Volume 2. Norske Oldfunn XXIII. Aarhus: Aarhus Universitetsforlag, 327–341.

Skre, D., 2007b. Preparing the new campaign. *In*: D. Skre, ed. *Kaupang in Skiringssal*. Kaupang Excavation Project. Publication Series, Volume 1. Norske Oldfunn XXII. Aarhus: Aarhus Universitetsforlag, 43–51.

Skre, D., 2007c. Towns and markets, kings and central places in South-western Scandinavia c. AD 800-950. *In*: D. Skre, ed. *Kaupang in Skiringssal*. Kaupang Excavation Project. Publication Series, Volume 1. Norske Oldfunn XXII. Aarhus: Aarhus Universitetsforlag, 445–469.

Skre, D., 2011. Centrality, landholding, and trade in Scandinavia c. AD 700-900. *In*: B. Poulsen and S.M. Sindbæk, eds. *Settlement and lordship in viking and early medieval Scandinavia*. The Medieval Countryside, 9, 197-212. Turnhout: Brepols.

Smed, P., 1962. Studier over den fynske øgruppes glaciale landskabsformer. *Meddelelser Fra Dansk Geologisk Forening*, 1962 (bind 15), 1–74.

Smith, M.E., 2009. Centenary paper: V. Gordon cholde and the urban revolution: a historical perspective on a revolution in urban studies. *Town Planning Review*, 80 (1), 3–29. doi:10.3828/tpr.80.1.2a

Sønderby, C., 1989. Dendrokronologiske dateringer på Wormianum 1988. *Arkæologiske Udgravninger I Danmark*, 1988, 242–250.

Sørensen, A.C., 2001. *Ladby – a danish ship-grave from the Viking Age*. Roskilde: Vikingeskibsmuseet i Roskolde.

Stenak, M., 2005. *De inddæmmede landskaber: en historisk geografi*. Kerteminde: Landbohistorisk Selskab.

Svanberg, F. and Söderberg, B., 1999. *Den vikingatida borgen i Borgeby*. Arkeologiska studier kring Borgeby och Löddeköpinge 1. Lund: Riksantikvarieämbetet, avdeling för arkeologiska undersökningar.

Tårup, K., 1934. Træk af Næsbyhoved Søs Historie. *Aarbog for Historisk Samfund for Odense Og Assens Amter*, XXII, 509.

Thrane, H., 1973. Odins ring. *Skalk*, 1973 (1), 32.

Thrane, H., 1982. Quadrilobe. *Fynske Minder*, 1981, 28–34.

Thrane, H., *et al*., 1982. *Fra boplads til bispeby. Odense til 1559*. Odense: Odense Kommune.

Thrane, H. and Porsmose, E., 1996. Stormand – præst – konge. *In*: O. Crumlin-Pedersen, E. Porsmose, and H. Thrane, eds. *Atlas over Fyns kyst i jernalder, vikingetid og middelalder*. Odense: Odense Universitetsforlag, 170–181.

Trap, J.P., 1957. *Danmark. Femte udgave. Bind V. Odense Amt, Svendborg Amt. Redigeret af N. Nielsen, P. Skautrup and P. Engelstoft*. København: G.E.C. Gads Forlag.

Ulriksen, J., 2011. Inland navigation and trade in a land without rivers – fjords and streams as navigation and trade routes in Viking Age Denmark. I: *siedlungs- und Küstenforschung im südlichen Nordseegebiet (SKN)*, 34. Verlag Marie Leidorf GmbH Rahden/Westf., 191–199.

Ulriksen, J., *et al*., 2016. Borgring sæson 1 – vold, brand og ødelæggelse. *Museum Sydøstdanmark. Årbog*, 2016, 10–21.

Ulriksen, J., Krause, C., and Jensen, N.H., 2014. Roskilde. En bygrundlæggelse i vanskeligt terræn. *Kuml*, 2014, 145–185.

Von Carnap-Bornheim, C., 2010. Comment on: uppåkra – lund. A central place and a town? Western Scandinavia in the Viking Age (B. Hårdh). *In*: B. Ludowici, ed. *Trade and communication networks of the first millennium AD in the northern part of Central Europe: central places, beach markets, landing places and trading centres*. Hannover: Konrad Theiss Verlag GmbH, Stuttgart, 112–114.

Vrængmose Jensen, C., 2017. *En kritisk analyse af Aalborgs ældste bebyggelse før ca. 1000 på grundlag af de arkæologiske kilder*. Unpublished thesis (master). Aarhus Universitet. Institut for Kultur og Samfund. Afdeling for Arkæologi og Kulturarvsstudier.

Vrængmose Jensen, C. and Møller, S.B., 2009. Algade 9 gør Aalborg ældre. *Årsberetning 2009. Nordjyllands Historiske Museum*, 99–105.

Weber, M., 1958. The city. *In*: M. Martindale and G. Neuwirth, eds. *The city*. New York: Free Press.

Zeeberg, P., 2000. *Saxos Danmarkshistorie*. Bind 2. Oversat af Peter Zeeberg. København: Det Danske Sprog- og Litteraturselskab/Gads Forlag.

Zinglersen, K.B., 2004. *Byens kulturlagsmodeller. Om metoden bag kulturlagsmodeller og den praktiske anvendelse heraf i Odenses middelalderlige bykerne*. Unpublished thesis (master). Aarhus Universitet. Institut for antropologi, arkæologi og lingvistik. Afdeling for middelalderarkæologi.

Appendix. Analysis of the archaeological record for Odense in the Late Germanic Iron Age and Viking Age

Introduction

The extensive archaeological investigations undertaken in advance of a major urban renewal project in the centre of Odense, the so-called Thomas B. Thriges Gade project has yielded significant new information about the earliest town. The excavation findings are supplemented by an investigation of an early bishop's grave in the original St Alban's Church, and in conjunction with the present project, minor research excavations have been carried out at Nonnebakken and the locality of Bispegården.

A number of scientific investigations have been undertaken in connection with the new excavations, including the acquisition of several AMS dates. There has also been the opportunity to undertake supplementary AMS dating of material recovered during some earlier excavations.

To achieve uniform recording of finds assemblages from the new and the old archaeological excavations in Odense, selected artefact groups recovered from the entire medieval town were examined in the spring of 2015 (Henriksen 2016).

Analyses have also been undertaken of a selection of the place-name evidence from the area (Christensen, L.E. 2015).

In the following, the extensive empirical foundation for an analysis of Odense's early history will be drawn together to produce an overall description of the main structural characteristics of the early town.

The appendix is not a presentation of one locality after the other, but is structured after important characteristics of urbanisation: central power, crafts, trade, permanency, cult and religion. Stray finds and written sources are, to present the full picture, included as 'other sources to the earliest story of Odense'. The structure means that localities can appear more than once if it for instance has both permanent house and traces of specialised craft.

Central power

Nonnebakken

Excavations

Nonnebakken (OBM 9782, 080407–27) is a central locality in Odense's early history and a long series of archaeological investigations and stray finds have led to many researchers, over the years, attempting to interpret its function and historical context (e.g. Olsen 1977, p. 86f., Arentoft 1993, Lundø 2012, 2013) (Figure 18). Between 1953 and 2015, about 25 excavation trenches, with an area of between 2 and 255 m^2, have been cut within the area thought to be delimited by the fortress ditch. A number of archaeological investigations have also been undertaken immediately outside the ring

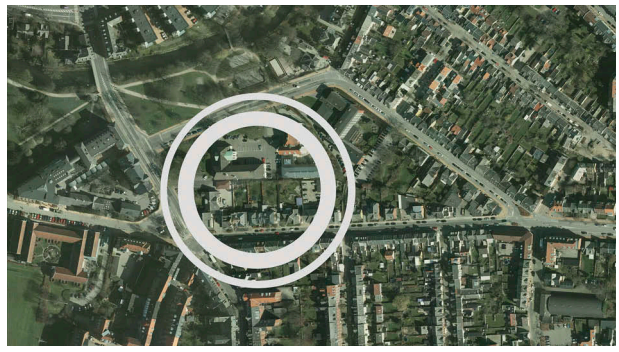

Figure 18. The outline of Nonnebakken in relation to present-day Odense. The outermost ring represents the ditch and the inner one marks the rampart. Background map: © Danish Geodata Agency.

fortress structure (Figure 19). Following digitalisation of the plans from these excavation trenches in 2012, the external diameter of the ditch was fixed at 184 m (Lundø 2012, p. 51) and the structure consequently covered a total area of c. 26,600 m^2.

Previous investigations at Nonnebakken have revealed several features that constitute parallels to the classic Trelleborg-type ring fortresses, Aggersborg and Fyrkat in Jutland and Trelleborg on Zealand, and the most recently discovered example Borgring at Køge, also on Zealand. The Scanian ring fortresses Trelleborg and Borgeby show similar features, too (Lundø 2012, Roesdahl and Sindbæk 2014a, Christensen *et al.* 2015, Ulriksen *et al.* 2016, Goodchild

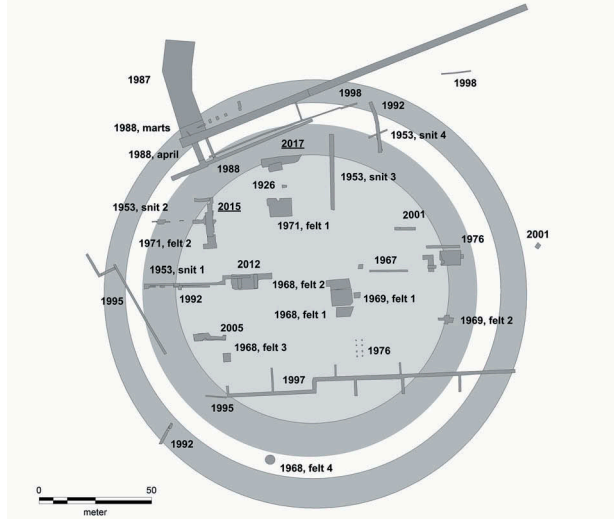

Figure 19. Locations of the excavation trenches at Nonnebakken and year of investigation. In 1953, 1967 and 1968–1971, the excavations were undertaken by the National Museum of Denmark, whereas subsequent investigations were carried out by Odense City Museums. The outer ring represents the ditch, the inner ring the rampart. Drawing: Mads Runge.

Figure 20. The distribution of Trelleborg-type fortresses. It is uncertain whether Trelleborg in Scania actually is a fortress of Trelleborg-type. Drawing: Mads Runge.

et al. 2017) (Figure 20), but the function of the former as a Trelleborg-type fortress is, however, subject to some controversy (Olesen, M.B. 2000, Sindbæk 2014a, Roesdahl and Sindbæk 2014b).[6]

Nonnebakken's similarity to the Trelleborg-type ring fortresses comprises several plan- and construction-related features, including the circular shape and the form and dimensions of the ditch and rampart. As for the date, the narrowly datable finds, as will be seen below, points unequivocally towards a date at the end of the tenth century (Roesdahl 1977, p. 167f., Roesdahl and Sindbæk 2014a, p. 253ff.). The same goes for a group of AMS dates. Finally, several researchers have interpreted a dendrochronological date of post-AD 967 for a stray find of a piece of wood, lacking sapwood, recovered from the ditch as support for this interpretation (Jensen and Sørensen 1990, p. 329, Lundø 2012, p. 53, Roesdahl and Sindbæk 2014a, p. 253f.). In truth, both the date and the link between the wood and the fortress' period of construction and use are though tentative.[7]

In the hope of resolving the question of whether Nonnebakken was an actual Trelleborg-type ring fortress or 'just' a ring fortress, in August 2015 and October 2017 Odense City Museums undertook minor research excavations in the northern and northwestern part of the site. The aim was to answer the question by determining whether or not there were traces of the aforementioned 'squares', a matter Olaf Olsen also attempted to resolve in his excavation campaigns of 1968–1971 (Olsen 2009, Lundø 2012, p. 36ff., 2013), and a northern gate. Subordinate aims were the achievement of a narrow dating of the structure, demonstration of possible earlier activity at the site and illumination of the environment in which the structure was constructed.

The investigation in 2015 revealed that the monument was very well preserved in these areas and several new constructional details emerged with respect to the rampart (see also Runge *et al.* 2016, Figure 21, see also Figure 40). It could also be shown that the rampart in at least the northwestern part is preserved to a height of at least 1 m (Figure 22). As a new feature for Nonnebakken, an inner ring road became apparent, like that seen at Fyrkat, Trelleborg and Aggersborg. The road had a width of c. 1.6 m, corresponding to that at Fyrkat, and evidence of a few sloping posts found on its inner side could suggest the presence of a railing or lean-to, as has also been suggested for Fyrkat (Olsen 1977, p. 81f.) (Figures 23 and 24). Several postholes and pits were uncovered on the internal fortress surface. Some of the postholes appear to form lines, corresponding to fences or house walls, but the limited extent of the excavation trench did not permit the identification of actual constructions. Finally, it could be demonstrated that some ground levelling had been undertaken prior to construction of the fortress, involving the addition of soil. The original ground surface had a very marked downward slope from east to west.

The excavation in 2017 had the specific aim of searching for the northern gate of the fortress (for details see Runge in press). The classical ring fortresses of Trelleborg type thus

Figure 21. The excavation trench for the investigations at Nonnebakken in 2015 at an advanced stage. Note how deep the fortress surface lies below the present terrain. Photo: Mads Runge.

Figure 22. A cross-section through the rampart at Nonnebakken. Lowermost is the yellow (light grey) subsoil and above this an old, darker soil layer. On top of the soil is an orange (light grey) layer of solid clay and then a turf-built rampart. Uppermost is a fill layer/made ground from modern times. Photo: Mads Runge. Drawing: The periodical *Skalk*.

Figure 23. Two sets of double postholes at the inner edge of the ring road at Nonnebakken. The road was to the right. From the excavation in 2015. Photo: Mads Runge.

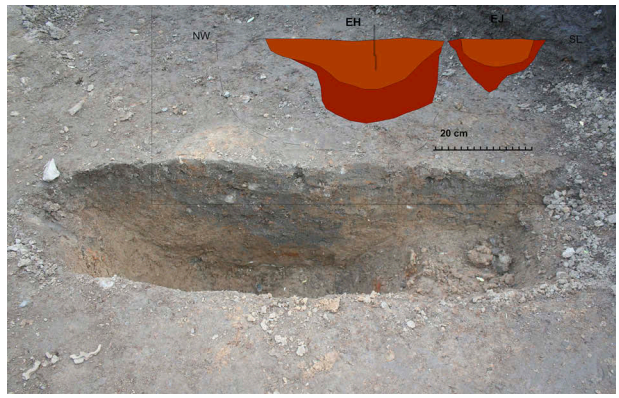

Figure 24. Northwest-southeast section through a set of ring road postholes (EH and EJ) at Nonnebakken. Photo and drawing: Mads Runge.

have four covered gates in the rampart, orientated almost towards the points of the compass. No gates had so far been demonstrated archaeologically at Nonnebakken, but on Braun's prospectus the ring fortress has two openings, one to the northeast, the other to the southwest (Figure 25). The fact that only two openings are shown on the prospectus can perhaps be explained by the fortress being 600 years old at the time and it might therefore have seen many changes over the years. A similar situation is evident on drawings of Trelleborg from the nineteenth century, where one or three openings can be seen (Nørlund 1948, 13ff.).

The state of preservation was good also in the excavation trench of 2017 and the ring road was also recorded here. The rampart had been removed at this spot by a developer's project in 1909 and the gate itself was therefore no longer to be found

Figure 25. Part of Braun's prospectus from AD 1593 with Nonnebakken in the foreground. The crossing over Odense Å between Nonnebakken and the early town also is seen. The mill Munke Mølle can be seen in the middle of the picture on a natural island in the river. After Füssel (2008, p. 184).

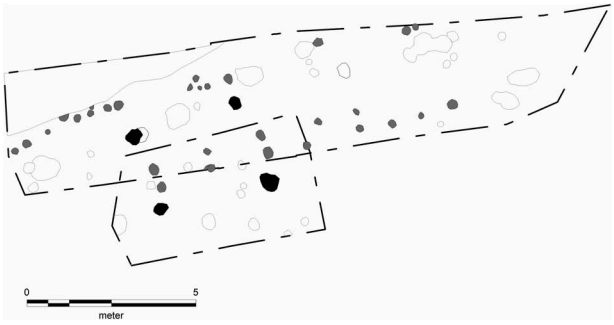

Figure 26. All the features in the excavation trench from 2017. The ring road (grey) and the four large posts (black) that potentially could mark the position of the gate are shown. Drawing: Mads Runge.

here. But two sets of large postholes were recorded in the middle of the excavated area measured out (Figure 26). The four posts potentially could mark the point of contact between the axial road and the gate; the positioning of such large posts here is also seen at Aggersborg. Incidentally, the four posts were placed at a 90° angle to the central point in the eastern and western openings shown on the historical map from 1785 (Figure 27). The distance east-west between the posts was 3.1–3.2 m, which would concur with the widths of the gates at the other ring fortresses of Trelleborg type (Nørlund 1948, p. 56, Olsen 1977, p. 64ff., Sindbæk 2014b). The exception is Borgring, where the distance was c. 4.4–5 m, internally, in the middle of the gate, and externally, respectively (Goodchild *et al.* 2017, p. 1037f.).

The hypothetical positioning of the gate was tested via a series of AMS dates. The results of these, however, did not, as shall be seen, support the interpretation of the posts being part of the Viking Age fortress. As conclusion we might say that the location of the northern gate – and the other gates – at Nonnebakken still need to be established archaeologically.

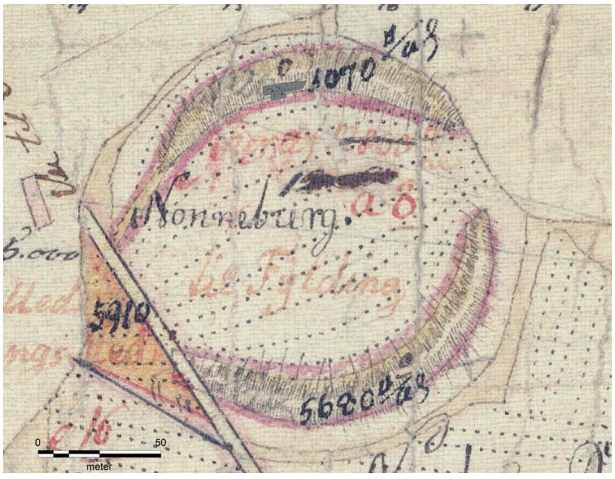

Figure 27. Historical map from 1785 showing openings to the east and west. The position of the excavation from 2017 (grey) is also shown. Drawing: Mads Runge. Background map: © Geodatastyrelsen.

Artefacts

The most striking artefacts found at Nonnebakken comprise a series of fine silver objects, which can be assigned to a total of five hoards. Four of these are unsystematically recovered and the fifth was discovered during the 2015 investigation. Even though the finds circumstances are not equally well illuminated in the four cases before 2015, there are no reasons to believe that all of them originate from the same deposition event.

– In 1775, a circular filigree brooch and a band-like arm ring, the so-called 'Odin's ring', were discovered (Figure 28(a,b)) (Thrane 1973). These objects must have

Figure 28. Circular filigree brooch (a) and band-like arm ring (b), the so-called 'Odin's ring', (diameter 7.3 cm) found at Nonnebakken in 1775. Photo: Søren Greve, The National Museum of Denmark.

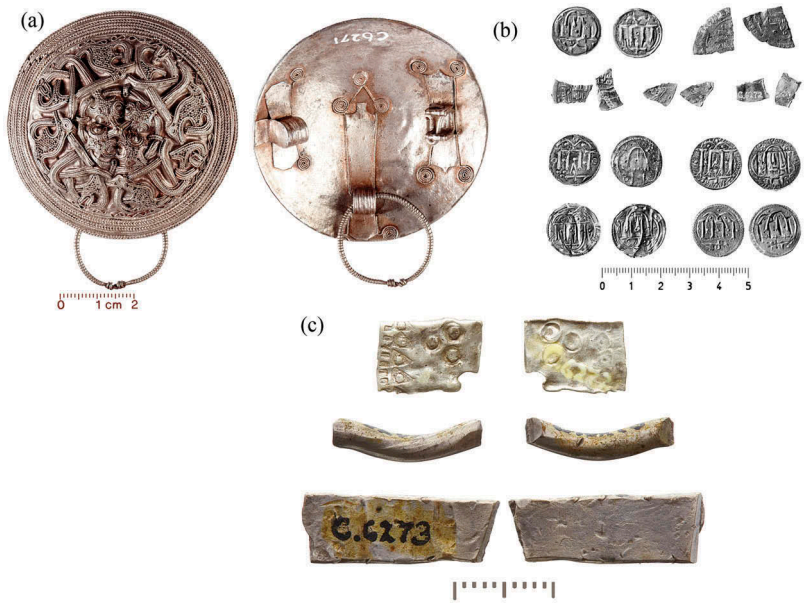

Figure 29. Circular filigree brooch (diameter 6.2 cm) (a), nine coins (b) and three pieces of hack silver (c) deposited together as a hoard and found at Nonnebakken in 1889. Photo, filigree brooch: Nermin Hasic. Photo, coins: John Lee, The Danish National Museum. Photo, hack silver: Søren Greve, The Danish National Museum.

been buried at some time after c. AD 970 (Skovmand 1942, no. 30).

- A combined deposition of a circular filigree brooch, nine coins and three pieces of hack silver turned up in 1889 (Figure 29(a–c)). The hoard is dated to the end of the tenth century (Skovmand 1942, no. 28), but according to Moesgaard (2015, p. 157) earlier than c. AD 975/988.
- In 1909, a combined hoard was found of 25 (perhaps 26, cf. Moesgård 2015, p. 158f.) silver coins, with the latest coin from AD 973, and two pieces of hack silver (Skovmand 1942, no. 28a) (Figure 30). Moesgård (2015, p. 158) suggests a deposition date before c. AD 975/980.[8]
- Prior to 1901, a circular filigree brooch (FS7021) came from the estate of the theologian Rasmussen, who was the owner of the property at Nonnebakken. As a result, and due to the piece's similarity to the circular filigree brooches found in 1775 and 1889, FS7021 has been assigned to Nonnebakken (cf. Skovmand 1942, no. 28; Thrane 1982) (Figure 31).
- A small pit found in the 2015 excavation inside the fortress, by a row of postholes, yielded a small silver hoard comprised of a sheet-silver bead, a quarter dirham and a *Sachsenpfennig* (Figures 32(a–c) and 40). The bead is dated to the tenth century, while the dirham fragment is dated to the period after AD 815.[9] The *pfennig* is difficult to identify precisely to type, but comes closest to types CNP 324 and 354, which are subtypes of, respectively, KN 1 and KN 3. These are often seen as two developmental phases in the same coin production in Magdeburg (c. AD 940–985). Given this interpretation, the Nonnebakken coin lies at the transition between the two types, or early in the time when KN 3 was produced, probably in the AD 970s. A secure, precise date within the maximum dating interval of AD 940–985 is, however, not possible.[10] The coin is not worn and therefore still has burrs from minting round its edge; this means that it could only have been in circulation for a short time.

Else Roesdahl assigns the silver hoards found between 1775 and 1909 to the time around AD 975–90 and most certainly no later than AD 1000 (Roesdahl 1977, p. 167f.; Roesdahl and Sindbæk 2014a, p. 253f.). Recent analyses of the coins have not altered this picture (Haupt 2006, Moesgård 2015, p. 157ff.), and the dating of the hoard found in 2015 is also consistent with this.

Three iron axes were discovered when soil was dug away from Nonnebakken in 1909, but these were submitted to the museum without any further information on their precise find spot or circumstances (Figure 33). As the southern part of the structure was presumably already built upon at this time, it can be assumed that the axes come from the northern half of the ring fortress. The axes represent Jan Petersen's types C, G or H and M (1919, p. 36ff.). While the two former types date primarily from the Early Viking Age, the latter continued in use into the eleventh century. The first two axes could tentatively be said to be coeval with the active period of the fortress, while it is possible that the third axe reflects later activities at the site.[11]

Four glass beads from pharmacist C. Mikkelsen's collection[12] from the first half of the twentieth century are said to have been found at Nonnebakken, and given the small size of these objects, it is remarkable that these were discovered during ground works, and that no other and larger artefacts were found at the same time (Figure 34). Even though several phases of sorting could have taken

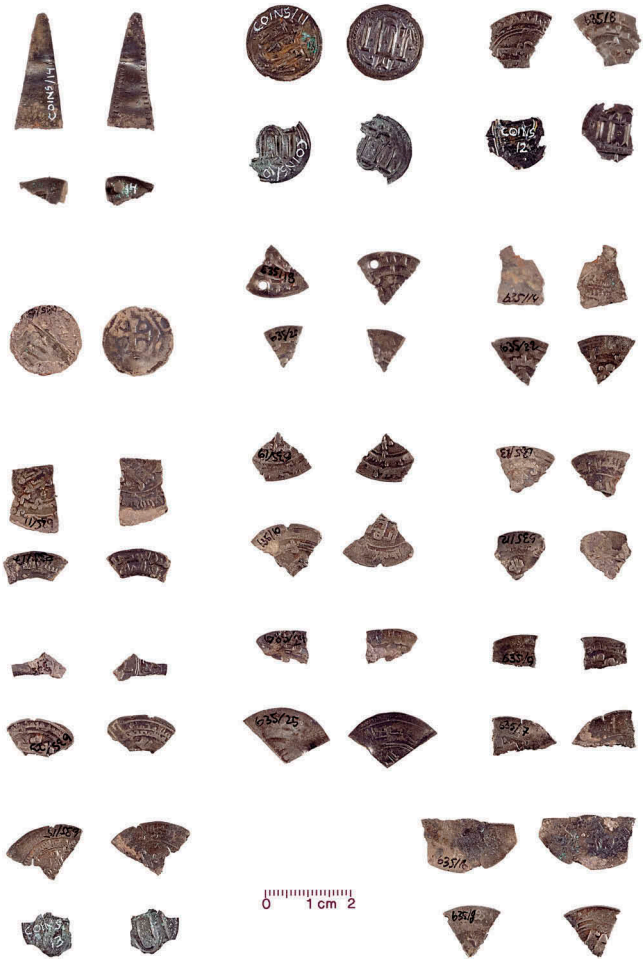

Figure 30. Twenty-five silver coins and two pieces of hack silver (top left corner) deposited together as a hoard and found at Nonnebakken in 1909. Photo: Nermin Hasic.

Figure 31. Circular filigree brooch presumed to be from Nonnebakken, found before1901. Photo: Jørgen Nielsen.

place between the beads being found and them ending up in the museum, it seems almost certain that they constitute part of a larger composite finds assemblage, for example a grave from the actual ring fortress or possibly its immediate environs. In general, it is unlikely that the beads can be more precisely dated than to the Viking Age.

From archaeological excavations, there are finds of a few glass beads and an unornamented band-shaped piece of hack silver. These objects cannot be dated precisely, but they may be from the Viking Age (Roesdahl 1977, p. 168; O. Olsen's report from the 1969 excavation: 3). A bronze ring-headed pin with a smooth ring and loop head (cf. Fanning 1990) can be broadly dated to the Viking Age (Figure 35), while parts of a double-shelled tortoise brooch, probably belonging to Jan Petersen's type JP51, dates from the tenth century (cf. Jansson 1985, p. 67ff.) (Figure 36).

A spindle whorl in finely tempered clay and parts of one or more crucibles, together with iron slag and a tablet-shaped lead weight are artefacts which show that craft and possibly trade activities have taken place at Nonnebakken (Figure 37). These objects are, however, not narrowly datable in themselves, and as they were not found in well-dated contexts, it cannot be determined whether they relate to the ring fortress' period of use – or to activities before or after its active period.

In the 2015 excavation, a Valkyrie brooch was found by metal detector in soil excavated by machine from a level immediately above the fortress surface (Figure 38). It is dated to the ninth century, and at least a further two examples are known from Funen: A fragment of similar brooch was recovered from a metal-rich locality at Engløkken, near the southeastern shore of Odense Fjord, while an intact example was found in the village of Rynkeby (the place name meaning 'the warrior village') in central Funen (Hansen 2017, p. 176). This brooch type is relatively rare in Denmark and is generally ascribed to localities that are thought to have had a degree of significance at the time (Petersen 2005, p. 76ff., 2010). From the same excavation a few sherds of flat-based, handmade Viking Age pottery were found in the rampart fill.

From the 2017 excavation, part of a hilt from a sword was found in a posthole on the fortress surface (Figure 39 (a,b) and 43). The mounting is curved in the length and made of iron. Thin layers of brass and copper are layed on the broad sides. The small hole in the middle indicates that the hilt is probably an upper hilt from a sword of special type 7 of Jan Petersen. The type is according to Petersen dated to the first half of the ninth century (Petersen 1919, p. 89).[13] This date contradicts with an AMS date of the posthole to 652–768 AD; a date which obviously might be affected by wood age or other factors.

In general, the number of artefacts that, with reasonable certainty, can be dated to the Viking Age at first glance seems small and the material has an atypical composition when compared with the greater and more varied material richness encountered during the excavations at Aggersborg, Fyrkat and Trelleborg. The overall picture is however distorted as the investigations at the three classic ring fortresses are of much greater extent than those at Nonnebakken. Moreover, particularly at Aggersborg, there are relatively few finds that can be ascribed to the fortress phase (Sindbæk 2014b, p. 227,

Figure 32. Sheet-silver bead (a), cut fragment of a dirham (b) and *Sachsenpfennig* (c) from Nonnebakken. Photo: Nermin Hasic.

Figure 33. Three iron axes from Nonnebakken, found in 1909. Photo: Jørgen Nielsen.

Figure 34. Four glass beads presumed to be from Nonnebakken. From pharmacist C. Mikkelsen's collection. Photo: Nermin Hasic.

Figure 35. Ring-headed pin from Nonnebakken. Photo: Nermin Hasic.

Figure 36. Part of an oval brooch found during the 1953 excavation at Nonnebakken. Photo: Nermin Hasic.

Pedersen and Roesdahl 2014, p. 261). If a comparison is made with Borgring, where the finds of Viking Age date are relatively sparse, the quantity of Viking Age artefacts recovered from Nonnebakken is quite substantial (Ulriksen *et al.* 2016).

One reason for the nevertheless limited number of finds recovered from Nonnebakken is the random nature of the collection of the artefacts up until the middle of the twentieth century. It can therefore be assumed that only the most

Figure 37. Tablet-shaped lead weight. Photo: Nermin Hasic.

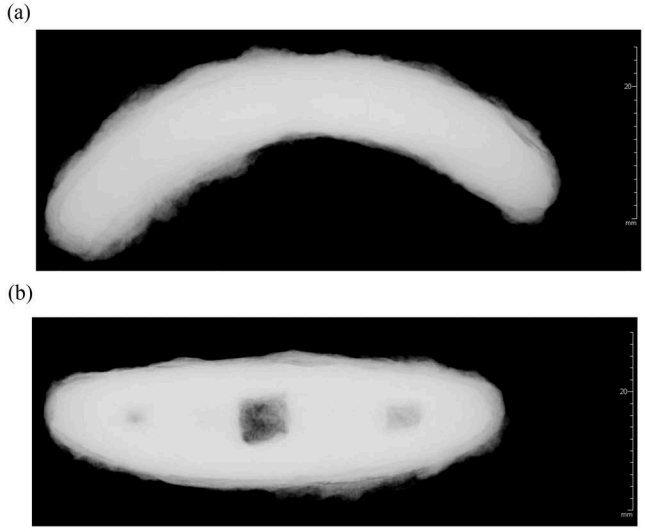

Figure 39. Mounting from sword hilt seen from the side (a) and top (b) from a sword. Nonnebakken. X-ray. Photo: Jannie Amsgaard Ebsen.

spectacular artefact types have been recognised or have come to the attention of the museum. Another factor is probably that parts of Nonnebakken has been dug away, including material above the investigated areas, while other parts have been disturbed by medieval and later structures. A third factor that may have had an influence is that the archaeological excavations have not consistently employed sieving of the soil layer.[14]

Over and above these source-related aspects, it is also possible that the number of finds reflects the actual situation, i.e. that the activities at Nonnebakken were not so extensive or extended over the same length of time as was the case at Trelleborg, Fyrkat and Aggersborg. A very limited amount of charcoal and ordinary household refuse, such as fire-brittled granite, potsherds and animal bones in the earliest archaeological horizon at Nonnebakken could suggest that this may well be a significant factor. The systematic excavations undertaken at Nonnebakken in 2012, 2015 and 2017 have, incidentally, not altered this picture.

Examination of the artefact material leads to three main conclusions: (1) Only few of the artefacts have been recovered from a sealed primary context. (2) Apart from the ninth century Valkyrie brooch and the hilt, the material does not appear to contain artefacts from the time prior to the tenth century, and the later material comprises mainly pottery. The latter has not been examined under the auspices of the present project and a previous examination showed that it predominantly dates from the Middle Ages and can consequently be ascribed to the time of the convent. (3) The few, narrowly datable artefacts were – as far as it can be determined from the

Figure 38. Valkyrie brooch from Nonnebakken. On the front, a standing shield maiden can be seen to the right and a Valkyrie mounted on a horse to the left. Below the horse is a rectangular tapestry woven from the intestines of fallen warriors. Photo: Nermin Hasic.

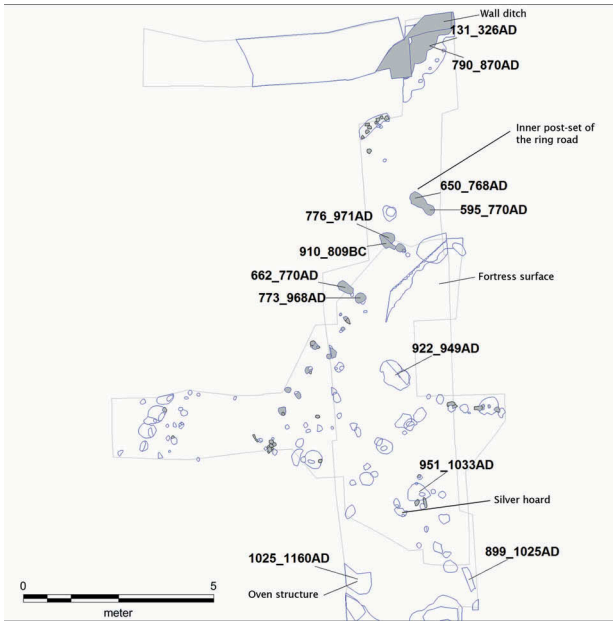

Figure 40. Distribution of AMS dates from the 2015 excavation at Nonnebakken. Grey: Stone and structures associated with the ring road and inner foot of the rampart. Broken grey line: Trench boundaries. Solid grey line: Other features and structures. Drawing: Mads Runge.

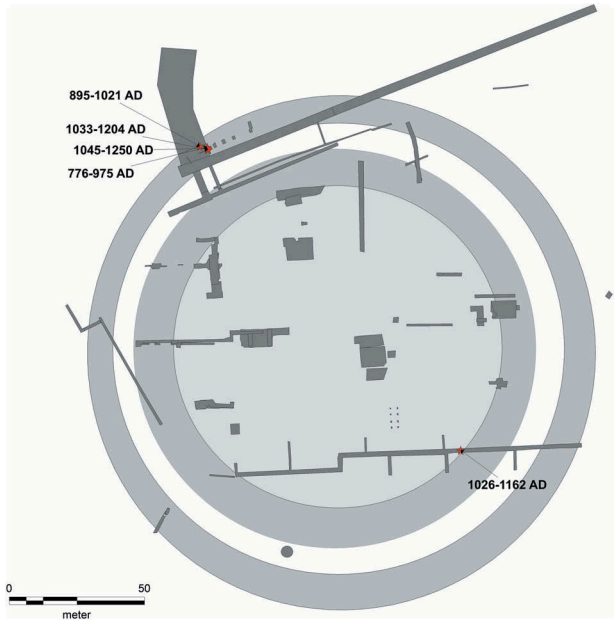

Figure 41. Distribution of AMS dates from earlier excavations at Nonnebakken. Drawing: Mads Runge.

available documentation – found scattered across most of the area enclosed within the ring fortress structure.

AMS dates

In all, 14 AMS dates were obtained in conjunction with the investigations at Nonnebakken in 2015 (see Figure 40). Unless stated otherwise, all AMS dates in this article are cited at 2 σ (95.4% probability).[15]

- *From the wall ditch for the inner rampart base* comes a date of AD 790–870 (charcoal, alder, young trunk(?), one tree ring, no bark) and a date of AD 131–326 (charcoal, unidentified species, diffuse porous hardwood, twig, c. ten tree rings, no bark).
- *From the inner post-set fortification of the ring road* come six dates of, respectively, 910–809 BC (charcoal, alder, young trunk(?), one tree ring, no bark), AD 595–770 (charcoal, alder, young trunk(?), one tree ring, no bark), AD 650–768 (charcoal, poplar/willow trunk/branch wood, two tree rings, no bark), AD 662–770, AD 773–968 and AD 776–971 (charcoal, ash, trunk/branch wood, one tree ring, no bark).
- *From postholes in the inner fortress surface* there are three dates of, respectively, AD 922–949[16] (charcoal, oak, from young trunk(?), one to two tree rings, no bark), AD 951–1033 (charcoal, ash, young trunk, two tree rings, no bark) and AD 898–1025[17] (charcoal, birch, young trunk, > six tree rings, no bark).
- *From a presumed medieval oven structure* comes a date of AD 1025–1160 (charcoal, beech, older trunk(?), outer five tree rings removed for dating, no bark).

To shed further light on the history of Nonnebakken, five new dates were obtained in 2016 for material recovered during previous excavations (Figure 41). Even though the material was sparse, it proved possible to obtain a date for a possible drainage layer towards the south and four dates from the lower layers in the northern part of the ditch. All five dates are for animal bones.

- *The drainage layer* was dated via a bird bone (OBM 9396 × 5) to AD 1026–1162.[18]
- The four dates *from the ditch* are for mammal bones (unidentified species) and are distributed as follows: basal layer BQ (NB88-BQ-1) dated to AD 895–1021; layer BT (NB88-BT-4), directly overlying layer BQ, dated to AD 776–975; layer BS (two dates), directly over layer BT, AD 1033–1204 (NB88-BS-22) and AD 1045–1250 (NB88-BS-23) (Figure 42).[19]

From the 2017 excavation ten dates were obtained (Figure 43).[20]

- *From the four posts that could mark the position of the northern gate* comes six dates of, respectively, BC 39,636–36,380 (charcoal, pine, trunk/branch wood, one tree ring, no bark), AD 652–768 (charcoal, oak, trunk, one tree ring, no bark), AD 1475–1641 (charcoal, probably spruce, trunk/branch, one tree ring, no bark), AD 1648–1918 (charcoal, birch, trunk/branch

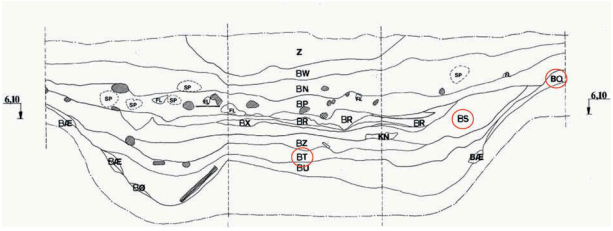

Figure 42. Section through the northern part of the ditch around Nonnebakken, showing the positions of the AMS dates. Drawing: Mads Runge.

wood, four tree rings, no bark), AD 1671–1943 (charcoal, unidentified species, trunk/branch, unknown number of tree rings, no bark) and AD 1677–1940 (charcoal, pome, birch, young trunk (?), one tree ring, no bark).

- *From the ring road there* comes four dates of, respectively, older than BC 45.000 (charcoal, oak (?), one tree ring, no bark), AD 695–891 (charcoal, oak, trunk/branch wood, one tree ring, no bark), AD 777–896 (charcoal, beech, trunk, four tree rings, no bark) and AD 887–1013 (charcoal, birch, trunk/branch wood, four tree rings, no bark).

The heterogenous result of the AMS dates from the site means that a great deal of caution in the use of them must be applied. Wood age on charcoal material, the use of possible redeposited material from the ditch, pollution by overlying cultural layers and so on are all factors that might alter the picture. To this might be added disturbances in the last centuries.

However, looking at all the AMS dates from Nonnebakken some general trends become visible. First there are two marked groups of dates. One in the period AD 600–800 and another in the period AD 780–1030. The first group of dates relates to activities before the Trelleborg type ring fortress phase and derives primarily from the ring road. The second group might reflect activities related to the Trelleborg type ring fortress phase and derives from both the ring road, the features in the fortress surface and the lower layers of the ditch. Besides these major groups there's dates that demonstrate a link with the Benedictine convent that stood on the site during the second half of the twelfth century, and which has given its name to the locality (Madsen 1988b, p. 106f.) Apart from these group of dates, there's a number of odd dates, ranging from BC 58.000 to AD 1950.

Discussion

Nonnebakken prior to the end of the tenth century.

The AMS dates indicate scattered activities during the Late Bronze Age and Early Iron Age, but these are not supported by finds and, consequently, nothing can be said about the nature of these activities. More significant are the group of dates, which fall in the Late Germanic Iron Age and Early Viking Age. The dating of the Valkyrie brooch and the hilt underlines these earlier activities at the site. Their more precise nature, given the limited extent of the investigated areas at Nonnebakken, is difficult to ascertain. If an attempt is nevertheless made, two possibilities emerge: Either that the dates represent an actual early fortress phase or that they relate to the existence of a pagan cult site, for example Odins Vi (Odin's shrine), as reflected in the place name Odense (cf. Kousgård Sørensen 1969, p. 13ff.). The arguments for and against these interpretations will be examined in the following.

An early fortress phase?.

The dates from the centuries prior to the Trelleborg phase and their contexts could

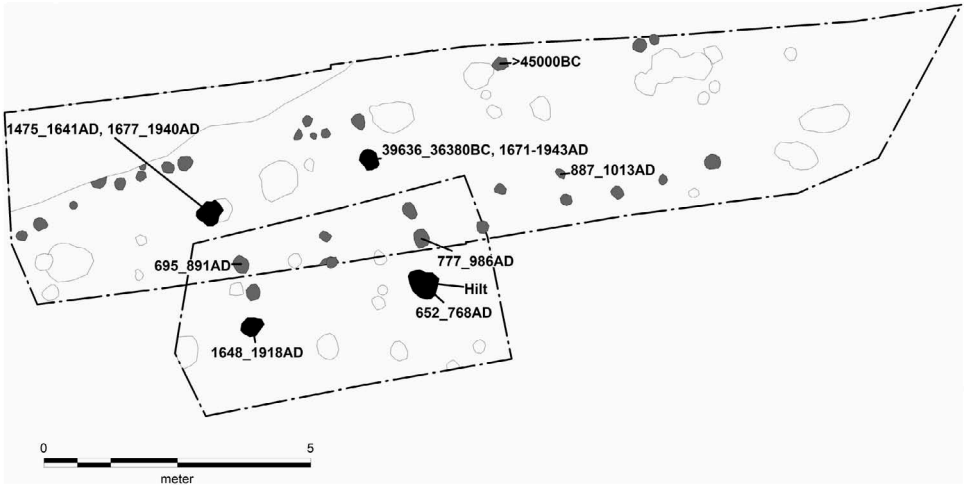

Figure 43. Distribution of AMS dates from the 2017 excavation at Nonnebakken. Grey: Structures associated with the ring road. Black: The four large posts marking the position of the gate. Broken black line: Trench boundaries. Solid grey line: Other features and structures. Drawing: Mads Runge.

indicate that there was already a fortress on the site prior to this. The appearance of a possible earlier fortress phase is though not known. Earlier fortress phases or, at least, a more complicated building tradition, are also known from Trelleborg on Zealand and the ring fortresses in Scania. Of the latter, possibly only Borgeby represents an actual Trelleborg-type ring fortress (Nielsen 1990, Svanberg and Söderberg 1999, Olesen 2000, Sindbæk 2014a, p. 235ff.).

An argument in support of an earlier fortress phase is that defensive structures in the eighth–ninth centuries are not exceptional in Denmark and other countries. Several continental ring fortresses were established in the Early Viking Age, and other defensive sites on Funen and adjacent islands are of the same date. The impressive rampart structure at St Albert's Chapel on Ærø springs to mind in this respect (Skaarup 1997, 2005, Henriksen 2012, p. 63). The dating of this structure rests on a rather flimsy foundation, but the excavator concludes that it was probably established during the Germanic Iron Age/Viking Age. The striking rampart and ditch at St Albert's Chapel can be readily compared with the defensive qualities of the classic Trelleborg-type ring fortresses. At a national level, the extension and reinforcement of the Danevirke and the establishment of the Kanhave Canal on Samsø constitute examples of military structures from the eighth century AD (Roesdahl and Sindbæk 2014b, p. 443; Nørgaard Jørgensen 2002). In a regional perspective, there is also a barrage in Henninge Nor on Langeland from the eighth–ninth century (Nørgaard Jørgensen 2002, p. 148, Skaarup 2005, p. 351).

Some degree of uncertainty is, however, associated with the interpretation of an early fortress phase at Nonnebakken. First, the ring road and the rampart base form part of a structure that is perceived as a Trelleborg-type ring fortress. If the ring road and the rampart base are to be linked to an earlier fortress structure, the Trelleborg-type fortress then 'lacks' some constructional elements. Second, the section through part of the rampart indicates that the fortress only has one phase. And finally stray and excavation finds from the area are in general from the second half of the tenth century. All in all, the possibility cannot be dismissed that the dates represent residual material from an earlier phase of activity which should not be viewed in the same context as the defensive structures.

An early pagan cult centre?. Alternatively, the same dates can perhaps be assigned to an early pagan cult centre. Together with the Valkyrie brooch, they fall directly in the active period and mythological universe of the Nordic Ase religion. There are no definite traces of a possible cult centre, but perhaps an up to 25 cm thick cultural layer containing charcoal, a few animal bones and, in particular, numerous pieces of fire-brittled granite discovered to the north of Nonnebakken during the excavation in 1987 should be seen in this context (Jensen and Sørensen 1990, p. 326ff.) (Figure 44). The layer's many large fire-brittled stones indicate that this is a primary deposit and not eroded-out material. Furthermore, the major content of fire-brittled granite and the absence of settlement refuse, i.e. finds such as potsherds, animal bones in significant numbers and iron and slag fragments, indicate that the deposit is unlikely to represent a refuse layer resulting from an ordinary settlement or from craft activities.

Figure 44. The southernmost part of the north-south section north of Nonnebakken, seen from the east. The black layer containing fire-shattered granite can be seen at the base of the section. This layer is overlain by redeposited medieval and later deposits. Photo: Nils M. Jensen.

If the absence of definite cult-related artefacts, prestige objects etc. is ignored, the composition of the layer can be said to show some similarities to the thick layers of burnt stones encountered at the Late Bronze Age settlement of Kirkebjerg in Voldtofte (Berglund 1982, p. 55ff.) and, in particular, at central settlements from the Late Iron Age/Viking Age. In the latter contexts, not least, deposits of this character are associated with cultic activities, perhaps the *hörgar* (altars) mentioned in the sagas (Christensen 2015b, p. 173ff.).

Another argument in favour of linking the early AMS dates with a pagan cult centre is provided by parallels with Harald Bluetooth's other fortresses. Trelleborg on Zealand was constructed on top of an earlier pre-Christian cult site (Nørlund 1948, p. 243ff., Jørgensen 2009, Dobat 2014, p. 54f.; Jørgensen *et al.* 2014). Similarly, the place name Onsild, near Fyrkat, indicates a possible relationship with the Ase religion (Olsen 1977, p. 35, Dobat 2014, p. 56). Aggersborg, too, has yielded evidence of possible ritual activities from pits and pit-houses. The activities should presumably be dated to the Viking Age, but cannot be securely placed in the chronological sequence of activities at the site (Sindbæk 2014c, p. 142f.). Perhaps the establishment of a Christian king's – i.e. Harald Bluetooth's – fortresses directly on top of the pagan cult centre should be perceived as an intentional demonstration of power, showing that the king can use these former pagan centres as he sees fit. Conversely, there is no indication that the king's new religion, Christianity, had to exclude the former pagan beliefs. On the contrary, some of Harald Bluetooth's other monumental constructions encompass

both Christian and pagan elements. For example, the combination of rune stones, burial mounds and a church at Jelling and the pagan graves evident at Fyrkat (Roesdahl 1977, p. 151).

In contradiction of the interpretation of the early AMS dates as representing traces of a pagan cult centre is, primarily, the total absence of actual structures and artefacts associated with a site of this kind. It must be said, however, that traces of this type must be assumed to be difficult to detect archaeologically.

Recent research findings also speak against this latter interpretation. These indicate that when a demonstration of power takes place in connection with a change of religion, the new authority will position its power base in the vicinity of the old power centre, but at some distance from it. This situation is illustrated by the establishment of Roskilde some kilometres away from the pagan centre at Lejre and is also suggested in relation to Uppåkra and Lund and the establishment of Viborg (Ulriksen *et al.* 2014, Krongaard Kristensen and Poulsen 2016, p. 37). The conversion from paganism to Christianity appears, however, less crucial as the background for the shift of central place from Uppåkra to Lund than in the shift from Lejre to Roskilde. Because at Uppåkra, the presence of Christian burials, and possibly indirectly that of a Christian church, has been demonstrated by the beginning of the eleventh century at the latest. The Christian burials lie only about 200 m from the cult house at the Uppåkra site, and there may have been a chronological overlap with its final phase (Anglert and Jansson 2001, Larsson and Lenntorp 2004, p. 42).

If, in spite of these caveats, the Roskilde-Lejre model is to be applied to Odense, it would be most obvious to assume that Odins Vi lay some distance away from Odense, for example on one of the rich metal-detector sites in Odense's hinterland. At the same time, it would be more likely to see a church as a marker of the new religion, rather than a fortress. Moreover, it has been previously suggested that the *vi* (shrine) more probably lay north of the river, i.e. Odense Å, in the area of the possible royal residence in the vicinity of St Alban's Church (Thrane and Porsmose 1996, p. 176). No traces of such a structure have, however, been demonstrated here.

Nonnebakken as a fortress of trelleborg type. As outlined above, a number of circumstances indicate that Nonnebakken was planned as a Trelleborg-type ring fortress, on the initiative of the king. The minor excavations that to date have been undertaken over time in the interior of Nonnebakken indicate, on the other hand, that the 'squares', i.e. groups of four buildings arranged around a quadrangle are absent. There can be different reasons for this.

One possible explanation could be that Nonnebakken never managed to function as a Trelleborg-type fortress. This conclusion is supported by the fact that the Trelleborg-type fortresses are, in general, only thought to have functioned for a very short period of time, perhaps 10–15 years (Roesdahl and Sindbæk 2014a, p. 255, Sindbæk 2014a, p. 236ff.). An even shorter period is possible in the case of Nonnebakken, as it may have been constructed after Aggersborg, Fyrkat and the early phase of Trelleborg on Zealand (Sindbæk 2014a, p. 241). The relatively few finds recovered from Nonnebakken support this idea. Preliminary investigations at Borgring indicate similarly that it was only briefly used, if at all. Investigations undertaken so far have not demonstrated the presence of buildings in 'squares' and the finds assemblage from the Viking Age is of very limited extent (Ulriksen *et al.* 2016, Goodchild *et al.* 2017, p. 1038). Even though Fyrkat as was taken into use, it too was probably not fully developed, as suggested by the incomplete southwestern ditch (Olsen 1977, p. 89).

Another possibility is that Nonnebakken did function as a Trelleborg-type fortress, but that not all of these fortresses were built according to the same internal plan. Maybe the requirement for interior buildings in 'squares' was less at Nonnebakken than at Aggersborg, Trelleborg and Fyrkat. Perhaps because Nonnebakken, as is seen, stood directly next to a functioning settlement, located on the opposite side of the river? A similar explanation possibly also applies in the case of the two Scanian ring fortresses (Jacobsson 2003, Svanberg and Söderberg 1999, p. 48), while it is not thought to be relevant in the case of Borgring, as it is located without connection to a functioning settlement.

The regional variations in the trelleborg-type ring fortresses. The possibility that the Trelleborg-type ring fortresses differed with respect to their internal layout is supported by the inclusion of the newly-discovered Borgring near Køge, Zealand, and the Scanian ring fortresses in the discussion. Though there has been some discussion of the degree to which the Scanian examples, and not least the Scanian Trelleborg, should be seen as actual fortresses of Trelleborg type (Olesen 2000, Sindbæk 2014a).

The presence of buildings in 'squares' has also not (yet) been demonstrated at the Scanian ring fortresses or at Borgring (Ulriksen *et al.* 2016, Goodchild *et al.* 2017, p. 1038). In this respect, it is interesting that Trelleborg on Zealand also possibly has an early phase without the strictly laid-out buildings and quadrangles (Ödman 2014, p. 268). Furthermore, the Scanian Trelleborg, like Nonnebakken, was possibly established on an existing settlement (Jacobsson 2003). A further regional variation is that there is a great deal to suggest that only Aggersborg and Fyrkat were built in a single operation as actual ring fortresses of Trelleborg type (Svanberg and Söderberg 1999, p. 57). On the other hand, Trelleborg on Zealand, and Trelleborg in Scania, together with Borgeby, all have several phases; respectively six, two and four. Moreover, the Zealand Trelleborg's earliest phase does not have either a rampart construction with horizontal beams or a ditch. Another special characteristic is that the two Scanian ring fortresses have a round-bottomed ditch, while the Danish examples have a V-shaped case. Finally, Trelleborg in Scania has a first phase that is AMS dated to the second half of the ninth century (Ödman 2014).

On the basis of the above, it has been highlighted that discussions of the fortresses of Trelleborg type have most often focussed on the similarities between the monuments, while the differences are actually greater (Ödman 2014). These differences could reflect a division into a western and an eastern group of ring fortresses, with the former comprising Aggersborg and Fyrkat and the latter Trelleborg on Zealand and Trelleborg in Scania, together with Borgring and Borgeby (Jacobsson 1999, p. 148, Svanberg and Söderberg 1999, p. 57). The differences between the Scanian fortresses and the Zealand Trelleborg on the one hand, and Aggersborg, and Fyrkat on the other, could possibly reflect a 'boundary' between east and west Denmark, which may have run down through the Great Belt (Sindbæk 2008, p. 69, Ödman 2014, p. 270f.).

In summary of the above, it can be pointed out that only Fyrkat and Aggersborg appear to have been established over a short period of time. The eastern group has a more complex constructional history and shows greater constructional variation (Svanberg and Söderberg 1999, p. 43ff., p. 57, Lundø 2012, p. 20). At least the earliest phase of Trelleborg in Scania must, with its dating to around AD 800, more likely be related to the contemporaneous fortress structures along the southern North Sea coast (Olesen 2000, p. 105ff., Sindbæk 2014a, p. 235). The early AMS dates for Nonnebakken can be paralleled with Trelleborg in Scania, and it is possible that Nonnebakken also had an early fortress phase, modelled on southern precedent.

At Aggersborg, there were other activities at the site prior to the construction of the fortress in the form of a magnate's settlement and a trade/craft site (Sindbæk 2014c). At Fyrkat, there are no traces of earlier activity on the fortress area (Olsen and Schmidt 1977, Dobat 2014, p. 55). Aggersborg and Fyrkat contain no traces of a previous fortification, but earlier fortress phases may have existed at the eastern Danish and Scanian fortresses of Trelleborg type. The strict layout of Aggersborg and Fyrkat may reflect that there was an opportunity here to establish the fortresses completely from scratch, while there were certain restrictions at the other sites as a consequence of the development being based on existing structures (Svanberg and Söderberg 1999, p. 57).[21] In functional terms, all the Trelleborg-type fortresses could readily have constituted a single entity, forming part of Harald Bluetooth's extensive construction works and as a part of the collective defences of the realm at that time, with the Jelling complex placed at their centre.

Nonnebakken and its surroundings. A remarkable feature of the distribution of finds from the period from the end of the Late Germanic Iron Age to the Early Middle Ages is that, apart from the site of Nonnebakken itself, these are all more or less located on the north side of the river. Not a single find from this period has been recorded within a semicircle of c. 1 km radius, centred on Nonnebakken. There could be several explanations for this situation. For example, the area is largely characterised by older private houses and gardens that were built without archaeological monitoring or prior archaeological investigation. However, given what has been found, also in the way of smaller artefacts, elsewhere in the town over time, the picture does appear to reflect a real tendency.

The aforementioned semicircle is closed to the north by the river, Odense Å, and on the first edition ordnance map from the second half or the nineteenth century it is evident that, to the southeast, there is a boundary in the form of a curved depression along the line of the semicircle, i.e. present-day Munkedammen (Figure 45). There are no immediately evident topographic boundaries to the southwest. The evidence suggests that the fortress was established in an area with no actual settlement itself, but adjacent to settlement located on the opposite side of the river. Moreover, the circumstances illustrate that the fortress and its master, the king, had the authority to keep the area to the south free of settlement. This was perhaps both a manifestation of power and a way of securing against attack from that direction. It may also have been a way of accentuating the fortress' visibility from a distance; a feature that also characterises the other fortresses of Trelleborg type (Roesdahl and Sindbæk 2014b, p. 438). To the north, the river and a possible town rampart constituted the defences.

The 'cleared' surroundings show strong parallels at other prehistoric power bases. The most obvious of these is the gap seen in relation to weapon graves and other prestige traces in the area around Viking Age Jelling. Here, it is suggested that the gap reflects the fact that the Jelling dynasty absorbed all power and prestige (Lindblom 2014, p. 29f.), and it is suggested that the weapon graves and, not least, the equestrian

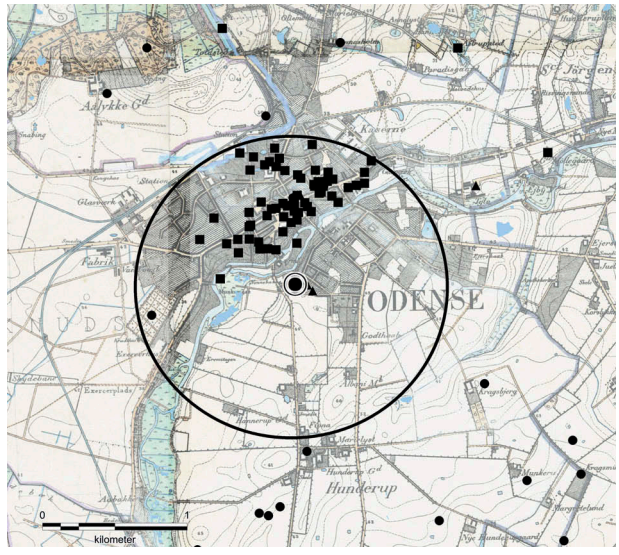

Figure 45. Nonnebakken (center circle) and coeval finds from the hinterland, plotted on the first edition ordnance map from the second half of the nineteenth century. Circle: Iron Age. Triangle: Viking Age. Square: Middle Ages. Diameter of the large circle is 1 km. Excerpt from the database *Fund og Fortidsminder* (Sites and Monuments) 16.3.2016. © *The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

graves could mark a protective circle around the power centre (Randsborg 1980, p. 127). This latter conclusion has though been questioned (Näsman 1991b, p. 171). The Early Iron Age Gudme dynasty is also characterised by an absence of weapon graves in its immediate vicinity. These are, conversely, located within a 'protective' semicircle at a distance from the dynasty's core area (Henriksen 2009, p. 340ff.).

The boundaries of the Viking Age town

In an article in *Fynske Minder* in 1974, Aage Lauritsen suggested that the curved course of the street Paaskestræde (OBM 3191, 080407–312), c. 100 m west of the square Albani Torv, could represent the eastern part of a semicircular town ditch around a Viking Age settlement on the north side of Odense Å (Lauritsen 1974) (Figure 46). In which case, the western boundary must most probably follow one of the present-day streets of Klaregade or more likely Munkemøllestræde. No archaeological observations have been made in support of Lauritsen's hypothesis. A minor investigation in 2013, in a narrow trench prior to laying a district heating pipe in Paaskestræde, did touch the area where the town ditch, according to Lauritsen, could have been, but no relevant features were observed. The fact that the town ditch was not recorded here does not necessarily mean that it has not existed, and future investigations should obviously exploit the opportunity to dig or take auger samples in places where this question can be addressed.

The boundaries of the medieval town are better illuminated. They consisted partly of natural depressions and partly of man-made, water-filled ditches, possibly augmented by ramparts and/or palisades (Madsen 1988a). From the thirteenth century onwards, the town's boundaries enclosed an area somewhat larger than that proposed by Lauritsen for the Viking Age defences (Christensen 1988, p. 67).

All in all, Lauritsen's suggestion can neither be confirmed nor dismissed. If what he suggests was true, the pit-house settlement at Mageløs/Klaregade and Vestergade 70–74, mentioned below, would have stood to the west of the town ditch. As will become apparent later, it is perhaps possible that a potential boundary more likely relates to the major ecclesial complex which, from the eleventh century, developed around St Alban's Church, with an associated churchyard and possibly an episcopal residence. But this remains pure speculation.

A royal residence?

In AD 1120, Ælnoth, an English monk who lived in Denmark from the beginning of the twelfth century, describes how, at the time of the murder of Canute IV in 1086, the royal residence stood near St Alban's Church (Johannsen *et al.* 1998–2001, p. 1729f.) (Figure 47). Tore Nyberg believes that the royal residence was located on the promontory at Klaregade/Mageløs, close to the later convent of St Clara and the present-day bishop's palace on an area later described as *kongsmark* – i.e. king's field (1982, p. 14). Based on the most recent translation of Ælnoth's chronicle, Anemette S. Christensen holds the alternative view that St Alban's Church was the church for the royal residence and the two were therefore located closer together, with the site of the royal residence perhaps being where the later St Canute's Abbey was built (Albrectsen 1984, p. 79f, Christensen 1988, p. 33, 70). Her view is supported by the discovery in 2015 of a bishop's grave in the earliest St Alban's Church, thereby identifying the church as a cathedral (Bjerregaard *et al.* 2016a, p. 152, 2016b). Archaeological traces of the royal residence have not, however, been demonstrated. This is perhaps not surprising in the light of the many later construction activities on this area, together with uncertainty about how such a royal residence would distinguish

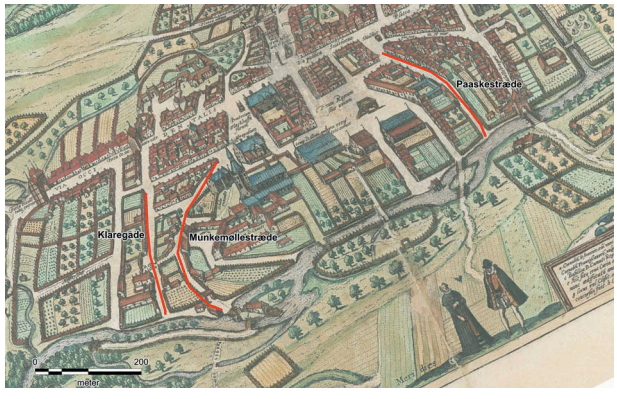

Figure 46. The proposed town ditch around the Viking Age town, in the form of Paaskestræde and possibly also Klaregade or Munkemøllestræde. Illustrated here on Braun's prospectus of 1593. © *The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

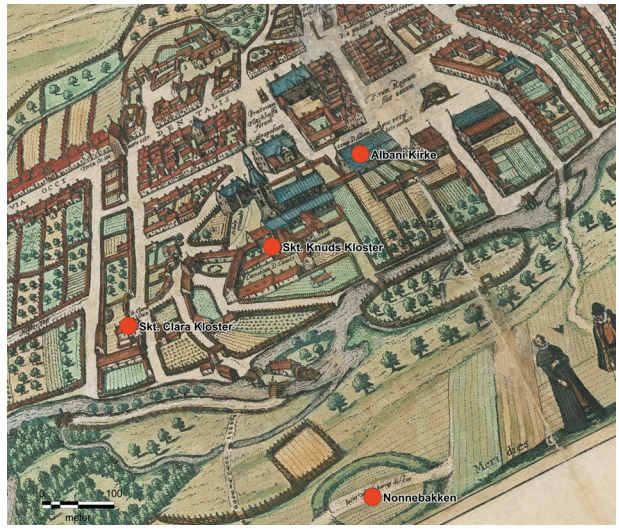

Figure 47. The proposed locations of a royal residence, shown on Braun's prospectus of 1593. © *The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

itself archaeologically from other traces. Moreover, it has been suggested that the royal residence was previously located in the fortress at Nonnebakken (Christensen 1988, p. 33, Olsen 2015, p. 326).

Coinage

The earliest evidence for coinage in Odense is from the time of Magnus the Good and Sweyn II Estridsson, i.e. the AD 1044/46–1048/50. Coinage continued to a limited extent in Odense in the eleventh century (Becker 1982, Christensen 1988, p. 33, 121f.). The earliest coinage is not documented in the archaeological evidence from excavations in Odense. Conversely, a Canute IV coin (AD 1080–86) minted in Odense was found during the ongoing investigation of the earliest course of Overgade-Vestergade under the auspices of the *Fra Gade til By* project (Jesper Hansen, oral communication; see also Poulsen 2016, p.132) (Figure 48).

Infrastructure

It has previously been suggested that the main east-west traffic route across Funen, marked in Odense by the streets Overgade and Vestergade, provided the basis for establishment of the town (Christensen 1988, p. 65, Madsen 1988a, p. 35) (Figure 49). It is not certain, however, that this theory can be maintained, given the results of the new investigations undertaken during the present project. As will become evident in the following, the earliest settlement phases appear to lie some way south of the road, and further down the slope towards Odense Å than the later medieval town. Perhaps the route running north-south past Nonnebakken, towards the town, was just as central to Odense's development?

Figure 48. Canute IV (top) and Niels coins from Odense. Photo: Nermin Hasic.

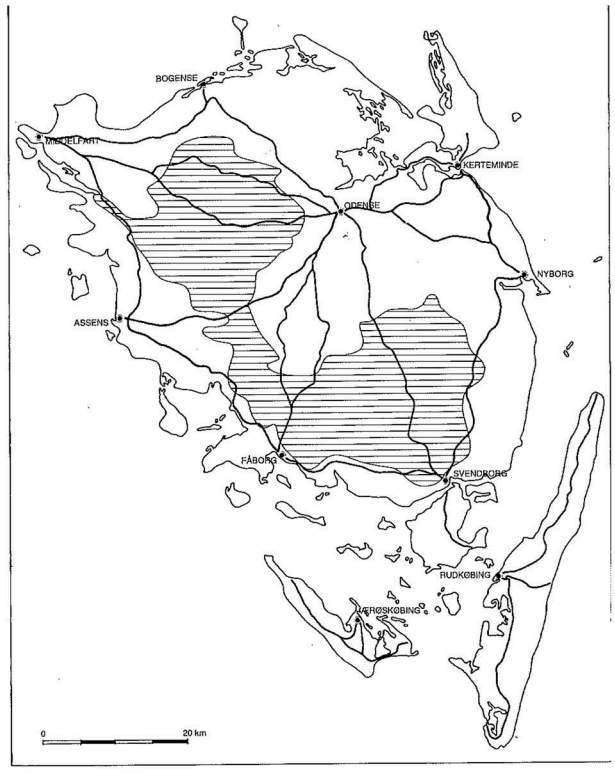

Figure 49. Funen's main medieval terrestrial/land traffic routes. The hatched area marks the Funen highlands. After Jørgen Elsøe Jensen (1992, p. 11).

The east-west traffic route across Funen must, under any circumstances, have played a significant role in the development of Odense. Through the investigations undertaken around I. Vilhelm Werners Plads it has been possible to demonstrate that the Overgade-Vestergade route can be traced far back in time (Figure 50). Immediately beneath the present road lay a series of predecessors, beginning with a phase laid directly on the subsoil, following removal of the original topsoil. This earliest road phase could, based on the stratigraphy and incorporated finds, be dated to the late eleventh or the twelfth century. The road layer immediately above this contained coins of Canute the Holy (1080–86) and Niels (1104–34) (Jesper Hansen and Jens Christian Moesgaard, oral communication) (cf. Figure 48). The earliest road layer overlies a posthole that has been AMS dated to AD 1026 (95.4%) AD 1062,[22] thereby providing a terminus post quem date for it. Finally, it could be demonstrated that the medieval settlement here was oriented with its main house facing out towards the road.

The possibility that the road could extend even further back in time is suggested by evidence of activities here as early as the eleventh century (cf. phase 3 in the settlement development). The results of an earlier investigation at Skomagerstræde/Overgade 1–3, where a stretch of cobbled road was uncovered that overlay the possible pit-house and fence mentioned above, support this suggestion. In the Viking Age and Middle Ages, as now, this was a north-

Figure 50. During the excavation at I. Vilhelm Werners Plads, the earliest phases of the Overgade-Vestergade route turned up beneath the present-day road. Photo: Odense City Museums.

south-oriented side road leading off the south side of Overgade-Vestergade. The road fill contained a number of finds from the eleventh and twelfth centuries: a ring-headed pin, a finger ring and a comb. The random way in which these finds could have been deposited on the road means their date can only tentatively be transferred to the road itself (Nielsen 1998, p. 27ff., Jacobsen 2001, p. 107). Its stratigraphic position and the associated finds mean that the eleventh century surface of Skomagerstræde could have formed part of a larger road network that also included Overgade-Vestergade (Nielsen 1998, p. 30), but it is not possible to link these together with certainty.

Other central routes in the medieval town included the topographically determined roads radiating out to other important areas of Funen. With their *stræde* suffixes, the north-south-oriented roads appear to have constituted side roads to Overgade-Vestergade (Christensen 1988, p. 52ff.). Traces of other medieval roads and lanes have also been identified archaeologically in several places in the town (Nielsen 1998).

As stated previously, the crossing over Odense Å, linking Nonnebakken with the early town on the north side of the river, probably lay in approximately the same place in the Viking Age as it does today, i.e. at the Munke Mølle crossing, where the river valley was narrowest and where a sand bank in the river made passage easier (Thrane *et al.* 1982, p. 109, Christensen 1988, p. 65ff.) (see Figure 25).

Crafts and trade

Traces of specialised crafts

Vestergade 70–74 and Mageløs/Klaregade

The localities of Vestergade 70–74 and Mageløs/Klaregade both contain traces of craft activities in the form of pit-houses associated with a finds assemblage of a composition and extent that indicate more than self-sufficiency.

In 1984, an area of c. 90 m^2 was excavated at Vestergade 70–74 (OBM8236, 080407–65), revealing a partially disturbed pit-house and parts of a presumed longhouse, as well as pits and postholes that could not be assigned to definite constructions (Figure 51). Both buildings showed probable signs of repairs and had therefore been in continual use over an extended period. No cultural layers were observed in the area, which was characterised by disturbances. The basal layer of the pit-house yielded sherds of flat-bottomed Viking Age vessels with an in-turned rim and/or hemispherical vessels, as well as two conical spindle whorls. Further to these were an iron leister and an ornamented single-sided comb with plates of flat, rounded cross-section (Figure 52). In the material recovered from Århus Søndervold, similar comb types form part of pottery horizon 1, which is dated to the ninth–tenth centuries (Andersen *et al.* 1971, p. 151). The upper fill layers in the pit-

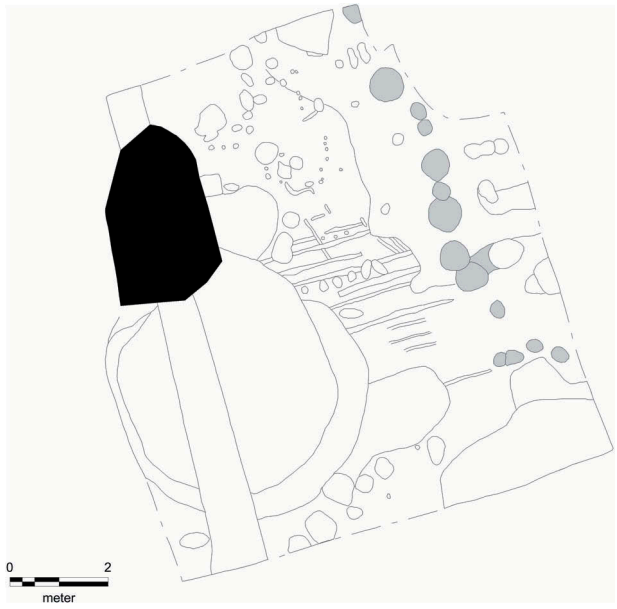

Figure 51. Plan of excavation at Vestergade 70–74. Black: Pit-house. Light grey: Postholes, possibly a house wall. Solid grey lines: Other features and structures. Broken grey lines: Trench boundary. Drawing: Mads Runge.

Figure 52. An iron leister and an ornamented, single-sided comb from the basal layer in a pit-house at Vestergade 70–74. Photo: Nermin Hasic. Drawing: Steffen P. Maarup.

house contained Baltic ware pottery, which can probably not be linked to the primary use of the structure. On the excavation surface, directly east of the pit-house, a bronze patrix was found that had been used in the production of disc brooches of Jansson's types II or III, or pendants decorated in Borre style (Jansson 1984, p. 62ff.) (Figure 53). Iben Skibsted Klæsøe has, on the basis of photos and a drawing of the patrix, dated it to around AD 900. Several features around the pit-house contained crucible fragments and lumps of melted bronze, reflecting bronze-casting activities that could be coeval with the patrix. Several of the features did, however, also contain Baltic ware pottery, which presents the possibility that this material could be slightly later than the patrix – or that it had become mixed in from earlier deposits. The features around the pit-house also contained slag, loom weights, a soapstone sherd, a glass ring and a glass bead. Sherds of Baltic ware pottery from the postholes in the presumed longhouse indicate that this construction

Figure 53. Drawing and photo of a bronze patrix from Vestergade 70–74. Photo: Jørgen Nielsen. Drawing: Steffen P. Maarup.

belongs to the same phase as the back-fill layer in the pit-house. All in all, the finds assemblage reflects crafts such as bronze casting, smithing and textile production in the ninth–eleventh centuries. The locality is therefore interpreted as part of a craft site or workshop area with activities extending from the time around AD 900 up until AD 1100 and, at least from AD 950, the latest date of the longhouse if the Baltic Ware pottery is counted as primarily deposited, see note 4, possibly also associated with permanent settlement. Two later wells from, respectively, the fourteenth century and the renaissance period show that the area was also occupied subsequently. Similarly, cultivation traces beneath the Viking Age features reflect earlier activities in the area (Jacobsen 2001, p. 72f.).

In 1998, in a narrow trench running along the streets of Mageløs and Klaregade (OBM9787, 080407–131), a total of c. 135 m^2 was excavated, leading to the discovery of two pit-houses (Figure 54). Based on the pottery from both the basal layer and upper fill layers, which consists predominantly of hemispherical

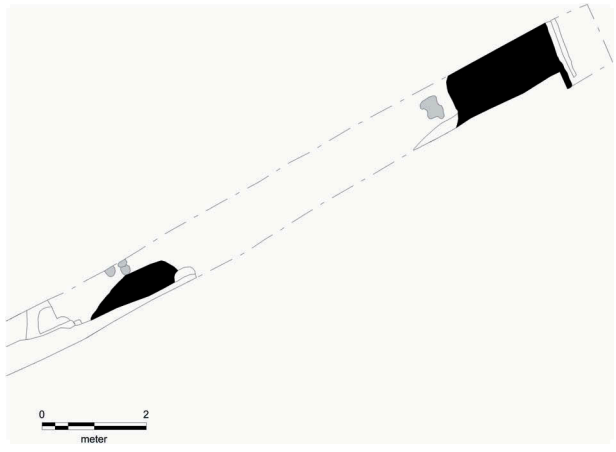

Figure 54. Plan of excavations at Mageløs/Klaregade. Black: Pithouse. Grey: Postholes. Solid grey lines: Other features and structures. Broken grey lines: Trench boundary. Drawing: Mads Runge.

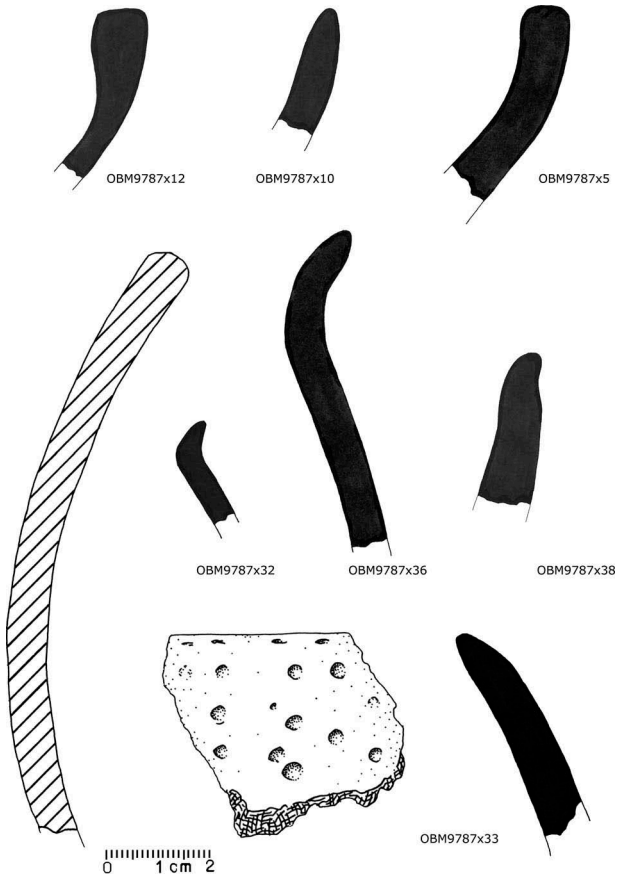

Figure 55. Pottery from the Late Germanic Iron Age/Early Viking Age found at Mageløs/Klaregade. Drawing: Steffen P. Maarup.

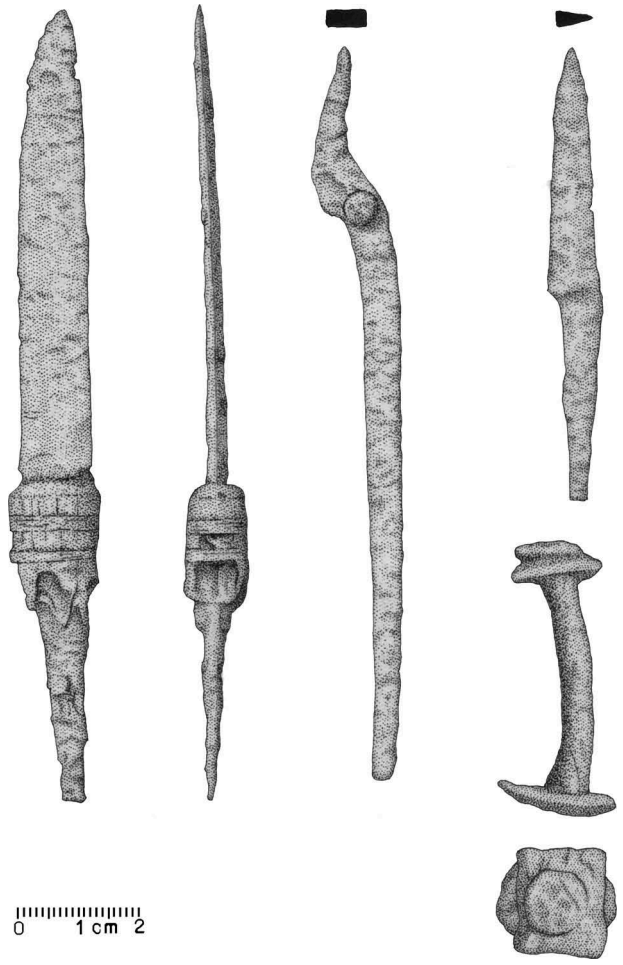

Figure 56. Iron knife wound with bronze and partially preserved wooden handle, iron tang, simple iron knife and iron rivet found in pit houses at Mageløs/Klaregade. Drawing: Steffen P. Maarup.

vessels, the pit-houses were dated to the Late Germanic Iron Age or Early Viking Age. This date is supported by the presence of potsherds that possibly originate from a bucket-shaped vessel, together with sherds from vessels with a narrowing below the rim (Figure 55). At other localities, the latter type is found in contexts from the Late Germanic Iron Age and Early Viking Age, but only to a limited extent from the end of the tenth century (Henriksen 1997, p. 33). This pottery date was, in part, further confirmed by the AMS dating of a bone from a ruminant from each of the two pit-houses to, respectively, AD 775–973 and AD 891–1019.[23] The contents of the pit-houses included an iron knife, wound with bronze and with a partially-preserved wooden handle, chisel fragments, an iron buckle to horse or dog harness, iron plates, iron bars, iron needles, bronze and iron fragments and pieces of iron slag, as well as spindle whorls and loom weights (Figure 56). The pit-houses also contained a well-preserved bone assemblage that included fish bones. The surrounding excavated postholes lacked datable finds and are not directly linked with the pit-houses, but could be coeval with them (Jacobsen 2001, p. 102f.). The finds from the two pit-houses indicate specialised craft activities, and the buildings are therefore unlikely to have belonged to a single isolated farm.

In December 2016, a small construction project in Mageløs, just north of the pit-houses excavated in 1998, prompted a minor investigation of a few small trenches, each of a couple of square metres in area. These trenches were excavated down to the subsoil, and in one of them a posthole and a larger feature, perhaps representing a pit or a pit-house, was found at subsoil level 8.5m northwest of the western most pithouse from 1998. Overlying these features a cobbled surface with an activity layer was registered. The posthole is AMS dated to AD 652–768, the large feature to AD 895–1021 and the activity layer to AD 809–1013.[24] The datings support the frame of the 1998-datings.

The archaeological finds from the pit-house area at Vestergade and Mageløs/Klaregade indicate that these, in contrast to many sites on Funen showing traces of specialised trade and craft activities, do not have roots extending back to the sixth century. On the contrary, the finds recovered to date indicate that the area was established late in the eighth or in the ninth century, at the earliest. This concurs with the settlement at Ejby Mølle (OBM 6050, 080407–79),

immediately east of Odense, which was established in the ninth century (Jacobsen 2001, p. 76ff.). Its position on a level, well-drained plateau extending out to the river, Odense Å, and very close to a point where the meltwater valley's slopes are fairly close together, is unlikely to have been random. Precisely this location must have been preferred when crossing from the area south of the river to that north of it, and vice versa. Consequently, the pit-house complex enjoyed a central location relative to the north-south traffic corridor, which later developed into the streets Hunderupvej-Klaregade.

New investigations near the pit-house area, Bispegården. The localities at Vestergade 70–74 and Klaregade/Mageløs therefore represent the earliest archaeological traces of settlement in Odense and thereby possibly parts of the earliest town. It was consequently a major aim of the current project to trace other parts of this area with the intention of upgrading the evidence via a more precise identification of function, a better dating foundation and a sharper evaluation of the area's extent. Unfortunately, more or less all of the potential area is densely built upon or located below central traffic routes in the town centre. A few minor areas, including the garden of the present bishop's palace (Bispegården, OBM 9789, 080407–128) do lie under grass. Under the auspices of the current project, the museum was permitted to dig a couple of short trial trenches here (Figure 57). The investigation also included metal-detector surveys of the exposed surfaces and the excavated soil.

Figure 57. Plan of the excavation at Bispegården. Grey: Trench boundary. Black: Features and structures. Drawing: Mads Runge.

The trenches revealed a relatively flat and undisturbed subsoil surface at a level of 7.5–8.5 m above DNN. No wetland deposits were observed on the subsoil surface and, together with the very limited slope of the terrain, the surface must be considered as well suited to settlement. Despite this, no artefacts, objects or cultural layers were found that were earlier than the sixteenth century. With some reservation, due to its relatively limited area, the investigation could indicate that here we are outside the town's settled area. Cultural layers, scattered features or stray finds from the Late Iron Age, Viking Age or Early Middle Ages would be expected if there had been actual *in situ* settlement here or a trade/craft site from this period.

Analyses of the place name Hetby. The archaeological and scientific dating of the pit-houses at Vestergade 70–74 and Mageløs/Klaregade to the end of the Late Germanic Iron Age or Early Viking Age means that these structures are some of the earliest in the centre of Odense. At the same time, these localities are situated around the western margin of the medieval town, if it is assumed that this coincided more or less with the town boundaries shown in Braun's prospectus from 1593. It has therefore been debated whether the finds should be ascribed to the earliest phase of Odense as a town or to an independent (rural) settlement.

In the report for the excavation at Vestergade 70–74, the possibility is mentioned that the finds relate to the remains of an abandoned village, Hetby or Heden. This suggestion is supported by the fact that there are several place names with the prefix *Hede* in the near vicinity (Arentoft 1984). The village is mentioned in a document dated 25 June 1175, in which King Valdemar the Great bequeaths the village and three smallholdings to St Canute's Abbey. The document's central passage in this respect reads as follows: '*... we have decided to convey the exchange of landed property which we have undertaken with the brothers in the monastery in Odense [St Canute's Abbey] by a letter, issued by virtue of our authority, and entrust this to posterity. He [the king] therefore gives by exchange of property these friars the village Heden and three smallholdings, "ornum, reb, gasetunge", and other [*i.e.*] that the citizens of Odense may not take their corn anywhere but to the friars' mill. [...] Renders/Rendered by Emer's hand, curate in Søllested, AD 1175 ...*' (Christensen and Nielsen 1977, p. 47, no. 49).

The link between the Vestergade (and Mageløs) locality and the village of Hetby is also mentioned as being likely in other later works (Nielsen, J. 1984, Jacobsen 2001, Ulriksen *et al.* 2014, p. 173). The project *Middelalderbyen* (The Medieval Town) similarly raises the possibility that the finds should be ascribed to the village of Hetby, but then points out that they could just as well belong to an early phase of the town of Odense (Christensen 1988, p. 33).[25] Conversely, in both *Trap Danmark* and Funen county's so-called village index, the document from 1175 is linked with

the village of Heden in Sallinge, located 16 km south of Odense (Trap 1957, p. 765; Fyns Amt 1992).

Under the auspices of the present project, Lisbeth E. Christensen, with input from Bent Jørgensen, Department of Nordic Research, University of Copenhagen, has examined the evidence relating to whether the place name Heden should possibly be ascribed to the area around Vestergade 70–74.

According to this analysis, the following points speak *in favour of* a location for Heden near Odense:

- The 1175 document's linking of Heden with St Canute's Abbey.
- The mention of the mill Munke Mølle (the monks' or friars' mill) in the same document.
- The occurrence of the place name Heden directly south of Odense Å.

While the following points speak *against* a location near Odense:

- The document was signed in Søllested in Båg district in southwestern Funen, more than 30 km southwest of Odense.
- The earliest maps of Odense have no villages with the name Heden or similar, only names of natural features. The latter, in which *hede* is included, also occur commonly across all of Funen. It is first in 1533 that the name Hedehus appears near Odense, more precisely on a level area c. 1.6 km south of the town centre (Kousgård Sørensen 1969, p. 7).
- The name Heden occurs in Sallinge, the neighbouring district to Søllested (c. 20 km east of Søllested). This is a well-established village with roots extending back at least to the transition between the Viking Age and the Middle Ages (Fyns Amt 1992).
- The fact that St Canute's Abbey is mentioned in the document does not mean that the endowment of landed estate is necessarily placed in Odense, as the abbey had lands in several places on Funen. There were also still abbey lands at Heden in Sallinge district in the seventeenth century.
- The locality of Vestergade 70–74 lies on the periphery of the medieval town of Odense, and not outside it, like a separate, independent village would.

All in all, Lisbeth E. Christensen's view is that the place name Heden mentioned in the document from 1175 should most probably be ascribed to the village in Sallinge district (Christensen 2015a). On this basis, the craft activities at Vestergade 70–74 and at Mageløs/Klaregade cannot be dismissed as part of the earliest settlement of the land that later hosted the medieval town of Odense.

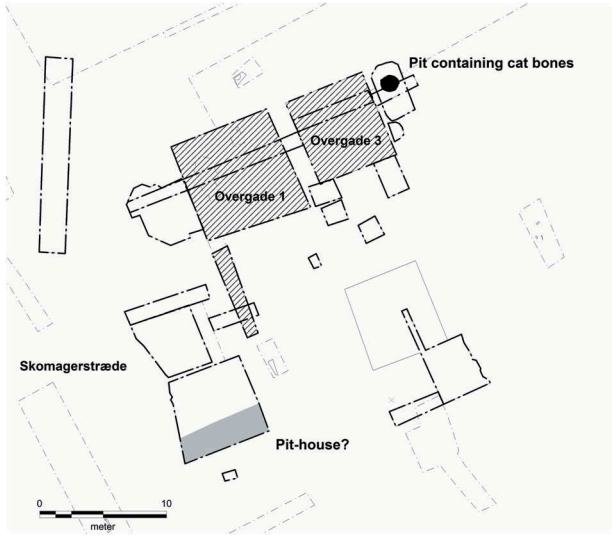

Figure 58. Plan of the excavation at Skomagerstræde/Overgade 1–3. The approximate positions of the pit-house and on the pits containing cat bones (part of the 'cat farm') are marked. The traces of permanent settlement could not be plotted in precisely. Black lines: Excavation trenches. Crossed areas: Medieval buildings. Grey: Possible pit-house. Solid grey lines: Other features and structures. Broken grey lines: Other trench boundaries. Drawing: Mads Runge.

Skomagerstræde/Overgade 1–3

In 1970–1971, in connection with the demolition of a building complex at the crossroads between the former streets of Skomagerstræde, which ran along the eastern side of the town hall, and Overgade, an archaeological investigation was undertaken of an area covering a total of 274 m^2 (Skomagerstræde/Overgade 1–3, OBM 8201, 080407–153) (Figure 58). In a few places, there was up to 0.5 m of undisturbed culture layers and the earliest activity on the site was represented by a possible pit-house and a number of postholes which formed the corner of a fence or a building. The fence/house and the possible pit-house are not plotted precisely in on the plans, but it is stated that the building lay in the southern part of the 1971 excavation trench, i.e. the area bordering the former street of Skomagergade (Grandt-Nielsen 1972, p. 206). The structures were overlain by a compact cobbled surface, laid out on top of the original soil surface, which could be followed over a distance of 25 m. Finds from within this cobbled layer included a ring-headed pin with a facetted head (cf. Fanning 1990, p. 130), dated to the Viking Age (Figure 59), a comb, dated to the eleventh century (Grandt-Nielsen 1972, p. 211f.; Jacobsen 2001, p. 107) and a finger ring, which is probably not earlier than AD 1100. With reservations for the difficulties associated with dating a road surface based on the finds found incorporated within it, a date of Late Viking Age/Early Middle Ages can perhaps be assigned to the cobbled surface (Jacobsen 2001, p. 107). Consequently, the

Figure 59. Ring-headed pin with facetted head found at Skomagerstræde/Overgade 1–3. Photo: Asger Kjærgaard.

Figure 60. Enamelled brooch found at Skomagerstræde/Overgade 1–3. Photo: Asger Kjærgaard.

pit-house and the post structure are probably earlier than this.

Alongside the cobbled surface, probably also from the eleventh century onwards, were settlement traces in the form of pits, wells, wall trenches, postholes and stone-built hearths (Grandt-Nielsen 1972, Jacobsen 2001, p. 107f.). The earliest well, dendrochronologically dated to AD 1113–14 (Bartholin and Grandt-Nielsen 1974, Bartholin 1977), was found to contain a large amount of refuse from shoemaking activities as well as traces of combmaking, etc. (Grandt-Nielsen 1972, Jacobsen 2001, p. 107f.). Another well, dendrochronologically dated to AD 1117, yielded an enamelled brooch of Anglo-Saxon/south Scandinavian type (Bartholin 1977, Baastrup 2009, p. 239: no. 40, Figure 29), which is dated broadly to the Viking Age or Early Medieval period (Figure 60).

The excavation also investigated a series of floor layers, through which had been dug several pits that proved to contain skeletal remains, including skulls, of cats in particular, interpreted as remains from a cat farm/furriery. The bones from one of the pits have provided an AMS date of AD 1070 ± 100[26] (Hatting 1992, Jacobsen 2001, p. 107f.). During the 2012–2016 investigations on I. Vilhelm Werners Plads, a layer from around AD 1100 was also found to contain some cat bones, including a couple of skulls displaying cutmarks, which perhaps should also be seen in relation to the furrier's workshop/furriery (Kirstine Hasse, oral communication).

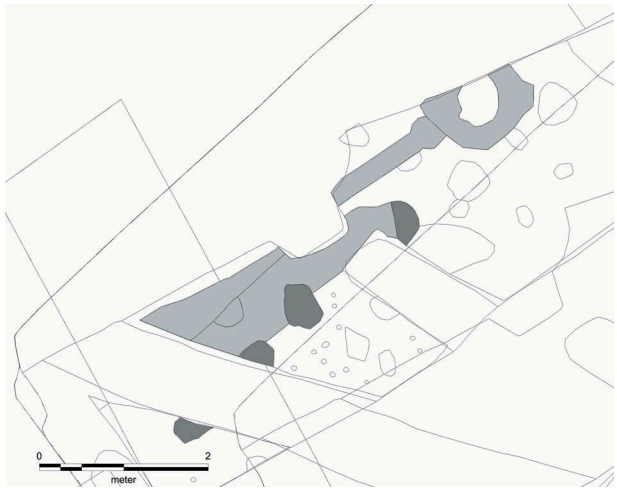

Figure 61. Plan of the excavation at Klingenberg. Dark grey: Postholes. Light grey: Pits or possibly parts of pit-house(s). Solid grey lines: Other features and structures. Broken grey lines: Trench boundary. Drawing: Mads Runge.

Klingenberg

At the locality of Klingenberg (OBM 9791, between Skomagerstræde/Overgade and Mageløs/Klaregade, 080407–109), an activity area was investigated at subsoil level, which included a number of pits that contained worked bone and antler, thereby testifying to combmaking, as well as ironworking activities (Figure 61). One or more of the pits could in the excavators' opinion perhaps represent pit-houses, only partly uncovered in a small trench. The activities cannot be dated more precisely than to the period from the Late Iron Age to the Early Middle Ages.

I. Vilhelm Werners Plads

During the extensive investigations at I. Vilhelm Werners Plads (OBM 9776, 080407–130), only sporadic traces emerged of trade and craft activities from the Early Middle Ages in the form of very limited quantities of workshop waste. No actual workshops were identified.

Traces of trade?

The specialised production represented by several of the pit-houses could implicitly indicate some form of basis for trade activities. Apart from a couple of sherds of soapstone and a large piece of basaltic lava, actual traces of trade activities from the period prior to the eleventh century, in the form of imported goods, hack silver, Arabic coins and weights, have not been demonstrated here (Henriksen 2016). Before this is taken as an indication of an actual absence of this activity, a couple of possible explanations will be presented for the lack of archaeological evidence for trade.

First, there are some source-related aspects relating to the degree of preservation and the form of the investigations. For example, the modest extent of the excavated areas is a significant aspect. Another factor is the absence – possibly due to the intense activities that have taken place from the Middle Ages until today – of cultural layers across more or less the entire area within which the pit-houses described above lie.

Second, it can be considered whether the trade activities in Odense were of a different character to those in the emporia; one that leaves fewer clear indications of trade. The emporia were, as described above, oriented towards long-distance networks, and because of this, the frequency of artefacts of foreign origin is clear and relatively easy to decipher for modern archaeologists. The next wave of proto-towns, of which Odense was one, were apparently oriented towards their immediate hinterland. Exchange of goods, i.e. 'trade', was therefore focussed to a much greater extent on everyday products, whereby for example foodstuffs came to Odense from agrarian settlements, and Odense, in return, provided specialised craft products indicated by the aforementioned pit-houses. Local exchange of goods/trade involving short-distance contacts of this kind is much more difficult to trace in the archaeological record than more distant links.[27]

A similar characteristic might be recognised in the case of Ribe from the middle of the 9th and the tenth century, the period of Ribe's history that has proved so difficult to recognise archaeologically (Feveile 2006, p. 48ff., Alrø Jensen 2013, p. 20ff.). In the case of Ribe it is suggested, that an explanation for the poor representation of artefacts with definite dating to the period might be due to a shift from an internationally orientated trade founded in the emporia to trade based to a higher degree on organic and local material (Alrø Jensen, p. 24).

The relatively numerous metal-rich sites from the Late Iron Age and Viking Age in the coastal zone along Odense Fjord could, in this context, have played a role as the places where the off-island network was maintained; so-called 'gateway communities' (Baastrup 2012, p. 329ff., 2014). The placing of a pivotal locality for this exchange could obviously be in the centre that already had been created at Odense, at the land traffic hub, the possible pagan cult site Odins Vi, and perhaps an early fortress phase at Nonnebakken.

Permanency

The pit-houses at Vestergade 70–74, Mageløs/Klaregade, as well as possibly Skomagerstræde/Overgade 1–3 and perhaps Klingenberg, have a finds assemblage that in its extent and complexity of composition indicates production over and above the norm for pit-houses at ordinary rural settlements. This specialised production could indicate that the aim was not self-sufficiency but trade or exchange to some degree or other.

It is not known whether the pit-houses at these localities actually constitute one or more entities. Consequently, it cannot be determined whether they formed part of a large specialised workshop area, such as the market place in early Viking Age Ribe, or whether these buildings represent more sporadic activities. Neither are there traces of a strict layout or structure as evident in the division into plots at Ribe's market place (cf. e.g. Feveile 2006). Extensive, deep cultural layers, as seen at Ribe – as well as at Funen workshop localities such as Hjulby (090611–116) (Henriksen 2000, p. 35ff., 2002, Feveile 2006, p. 31ff., Juel 2010), Hårby (080209–146) (Henriksen and Petersen 2013) and Vester Kærby (Henriksen 2013) – are completely absent from Odense. It is unknown whether this absence could be due to the localities in Odense, unlike the others mentioned, having been subjected subsequently to an enormous level of activity in both the Middle Ages and, not least, modern times. Similarly, direct evidence of trade is also lacking in Odense. The degree to which the pit-houses in Odense represent permanent or sporadic activities is, of course, a crucial factor in the discussion of whether or not there was a town. The relative proximity, i.e. 140 m, between Vestergade 70–74 and Mageløs/Klaregade, combined with the topographic conditions, means that interconnection was not impossible. In which case, it must have been an area of a considerable size.

Several circumstances therefore indicate that the aforementioned pit-house localities do not simply reflect the self-sufficiency of an agrarian settlement. Their products and number indicate that, at least partially, their activities were directed towards sale and not merely self-sufficiency. But it is not yet clear whether the area should be perceived as a seasonal trade and craft site or as a permanent, urban structure, typologically classified by Hodges as 'gateway communities' of types A or B (Hodges 1982, p. 50ff., Skre 2007a, p. 329ff.).

This discussion has recently been brought sharply into focus in a new analysis of the earliest phases of the market place in Viking Age Ribe (Croix 2015). Previous studies here indicated that it was not until the second half of the eighth century AD that Ribe could be considered an actual town, with year-round habitation and permanent activities on the market place. At the beginning of the eighth century, on the other hand, the market place appears only to have had seasonal use, and it was suggested that an actual year-round, permanent settlement could have been located nearby (Feveile 2006, p. 40, Skre 2007a, p. 336f.).

The new analysis of Ribe has focussed on the search for permanent settlement on the earliest part of the market place. Permanence here is reflected primarily by the fact that, from the outset, turf was laid out in parts of the market place, in order to stabilise the terrain with the aim of creating a basis for a more permanent and substantial settlement. This would have required a more stable foundation than the flimsy structures associated with trade and craft activities at a seasonal market place. Permanence is also evident from finds of loom weights and quernstones, which may indicate

textile production and the presence of women on the site, as well as food production. All of these can be perceived as signs of everyday life rather than seasonal activity. A third argument for permanence in the earliest phase of the market place is provided by the discovery of the southeastern corner of a house defined by a clay floor and wall trench. The fact that the building was apparently of lighter construction than houses in coeval rural settlements is not an unusual situation for urban dwellings. Remains of the building can be traced over an area of c. 6 × 1.5 m and the finds assemblage is perceived as being associated with everyday activities (Croix 2015, p. 50ff.).

The individual points made in this study can all be questioned in tangible terms. For example, large numbers of loom weights have been found at the landing site at Strandby (080209–57) in southwest Funen, and in the later part of its active phase this site was bounded seawards by two ditches, despite it being a seasonal locality (Henriksen 1997). As conditions for, and a methodological approach to, the identification of permanence in a settlement, the points made do appear appropriate. With regard to the pit-house localities in earliest Odense, there are certain signs of permanence: At Skomagerstræde, the course of adjacent roads and the craft activities do appear to indicate an urban context (Jacobsen 2001, p. 108). However, it should be emphasised that the road layers and (most of) the craft activities appear to be later than the actual pit-house.

At both Vestergade 70–74 and Mageløs/Klaregade, the artefact assemblage from the pit-houses includes several indications of textile production. Similarly, cultivation traces have been recorded at Vestergade 70–74. However, at least some of these are stratigraphically earlier than the pit-house activities. The cultivation traces are also apparently ard marks and should, on this basis, most probably be assigned to the period Late Bronze Age/Early Iron Age (Runge 2009, p. 117).[28]

At Vestergade 70–74, Skomagerstræde/Overgade and Klingenberg there are rows of postholes, and at Mageløs/Klaregade scattered postholes, which could be coeval with the pit-houses. The postholes at Skomagerstræde/Overgade and Mageløs/Klaregade lack finds, which makes it difficult to link them to the pit-houses. At the other two localities, the finds enable a connection to be made between the pit-houses/workshop activities and the ordinary houses.

According to the excavator, the post row at Vestergade 70–74 comprises a slightly irregular, 6 m long row of seven closely-spaced postholes. The close proximity of the postholes indicates that several of the posts had been replaced. The postholes contain no brick or tile fragments, but two did hold Baltic ware pottery. Several pits at the site have yielded daub fragments, without it being possible to ascribe these to the building. The excavator sees no basis in the evidence for interpreting the house's construction or orientation, and the excavation report states that a date in the twelfth century seems reasonable (Arentoft 1984).

Christensen (1988) maintains that the post row is associated with a later layer than the pit-house. But this is not stated in the excavation report, from which it is also apparent that there was no cultural layer preserved at the site. Similarly, the site plan shows no stratigraphic overlap between the pit-house and the post row (Arentoft 1984, Christensen 1988, p. 33).

It is evident from the site plan that the post row can be followed further south and therefore has a length of c. 8 m. To the south, it possibly terminates at a house corner that turns eastwards. It is also clear from the report that the interpreted postholes do not contain brick or tile fragments, but a few of the features are said to be 'barely deep enough to be postholes' (Arentoft 1984). In the light of the present much greater knowledge and experience of houses from the period spanning the Late Iron Age to the Early Middle Ages, the latter statement no longer seems either valid or an argument for not linking these features to the post row. The houses of this period can be very irregular in shape and in the form of the individual postholes (Hansen 2015, p. 89f.). At the same time, we do not know the original surface level, i.e. the possible floor level. Consequently, a statement of the base level would actually have been more revealing than the feature depth. If the new interpretation of the construction is correct, it is possible that the longhouse and the pit-house could have been partly coeval.

The dating of the structure, based on the Baltic ware pottery, to the twelfth century is similarly open to question. Baltic ware pottery is difficult to date precisely but can, as mentioned, be divided into an early, non-thrown variant, earlier than AD 950–1050, and a late, secondarily thrown variant with a broad dating frame of 1000–1300. Here, the early variant is present, though it is not soft-fired ware. Overall, the house can, as also shown by the above-mentioned analyses of the locality's deposits, features and structures, be coeval with the fill phase of the pit-house, and with its replaced posts, it marks a relatively high degree of permanence at the 'market place'.

The post row at Klingenberg could constitute part of a house wall, but the limited number of posts renders an interpretation difficult (cf. Figure 61). The fact that the posts represent a more permanent structure is, however, a possibility. Consequently, there could have been a permanent longhouse settlement associated with the specialised craft activities.

Possible permanent dwelling houses

In the following, localities in the town centre will be examined where, from the study period, there are records of either (a) actual house outlines or ground plans, (b) post rows that could possibly have been part of walls or (c) internal post constructions in buildings or concentrations of unsystematically distributed postholes that could possibly represent parts of houses. The two latter categories are a natural consequence of the fact that urban archaeological investigations are often of limited areal extent. Unlike the possible permanent houses at the pit-house localities mentioned previously, the houses dealt with here cannot be assigned to a similar context and appear more likely to represent an ordinary settlement.

Vestergade 70–74

The possible remains of a permanent house at this location are mentioned in the part regarding 'specialised craft'.

Møntergården

The locality Møntergården (OMB 8231, 080407–170) lies at the eastern edge of the medieval town and adjacent to the medieval streets of Møntestræde and Sortebrødre Stræde (see Figures 2 and 62). Møntestræde is mentioned in written sources from the thirteenth century and must have linked Overgade with the predecessor of Sortebrødre Stræde. Excavation of a coherent area of 1200 m^2 revealed the remains of a three-aisled longhouse at subsoil level. South of this house was a post row that could represent the northern row of roof posts of a similar house. To the west was a four-poster structure. It is not known whether these three structures, or even two of them, stood at the same time. East of the gable of the fully-uncovered house were a couple of pits that contained sherds of Baltic ware pottery and hemispherical vessels, probably from the Early Viking Age. It is unknown whether the houses and pits are coeval. Typologically, the three-aisled house appears, on the face of it, to be of Bronze Age or Early Iron Age date. But as there is still some uncertainty with regard to the house typology on Funen in the Late Germanic Iron Age and Early Viking Age (cf. Hansen 2015, p. 89f.), it is possible that these buildings could be coeval with the aforementioned pits. An Urnes brooch, of eleventh–twelfth century date, was found in an excavation in 1982 directly south of the house sites (Lønborg 1994, p. 377, Bertelsen 1994, p. 365) (Figure 63).

Figure 63. Urnes brooch found in Møntestræde at Møntergården. Photo: Asger Kjærgaard.

Vestergade 13–15

n connection with the renovation of a cellar, three overlaying clay floors were discovered in one of the cellar walls; the middle layer of the three had two phases (OMB 8212, 080407–158) (Figure 64). Due to their robust clay composition, the presence of overlaying floor deposits (i.e. dirt layers) and associated hearths, the floors are interpreted as representing dwelling houses. The stratigraphically earliest house, house 1, has been AMS dated, using charcoal from a dirt layer on top of the clay floor, to the period AD 991–1148. Moreover, the earliest floor layer overlies a feature that is dated to the period AD 989–1114 by an AMS date for a bone. This constitutes a terminus post quem date for the earliest floor layer. Finally, charcoal from a fire-affected layer, a possible hearth, immediately beneath the floor layer of the stratigraphically second-earliest house, house 2a-b, has been dated to AD 897–1016.[29]

The dates for the floor layers are remarkable because those from the stratigraphically earliest house are later than the date for the stratigraphically second-earliest house. An explanation might of course be that the dates are on redeposited material. A modern disturbance, in the form of a large concrete foundation directly between the two floor phases, means that it is difficult to gain a comprehensive

Figure 62. Plan of the excavation at Møntergården. Dark grey: Postholes from houses. Light grey: Pits. Solid grey lines: Other features and structures. Broken grey lines: Trench boundary. Drawing: Mads Runge.

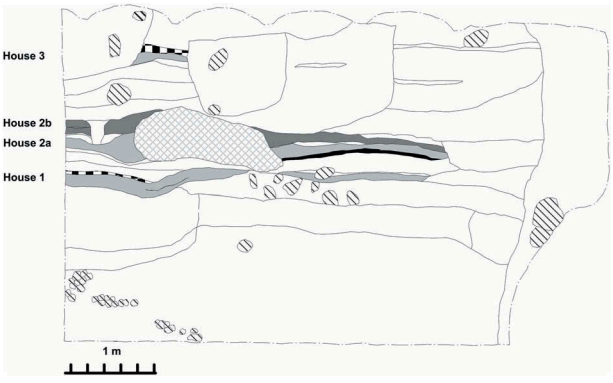

Figure 64. North-south section through a series of floor and cultural layers at Vestergade 13–15. Light and dark grey: Floor layers. Check pattern: Dirt layers. Black: Heat-affected layers. Cross-hatching: Modern disturbance. Drawing: Mads Runge.

overview of the mutual relationships between the layers. On this basis, we are only able to say that we have here three cut-through house floors that broadly date to the period AD 897–1148. Due to a lack of suitable material, it was not possible to AMS date the stratigraphically latest house, house 3. Finally, it should be noted that there were also cultural deposits beneath the earliest house which must represent traces of earlier activities.

Vestergade 43–49

Through a combination of several minor excavations and watching briefs undertaken between 1985 and 1999, a total of c. 300 m^2 has been investigated within an area of c. 5800 m^2 around Vestergade 43, 49 and 55 (OBM 8240, 8260, 9793, 080407–80) (Figure 65). Most of the locality's features and structures – a hearth, fragments of a cobbled surface, one or two presumed wells and part of the town's western ditch – are dated broadly to the Middle Ages. Three pits with no traces of brick or tile fragments did, however, contain sherds of Baltic ware pottery, a wooden trencher, a bone comb fitting and a brass pin. On this basis, the three pits can be assigned to the Late Viking Age or the Early Middle Ages. The finds and recorded structures and features reflect settlement activities that were associated with a permanent settlement area which, based on the pottery, cannot be dated more precisely than to c. AD 900–1100.

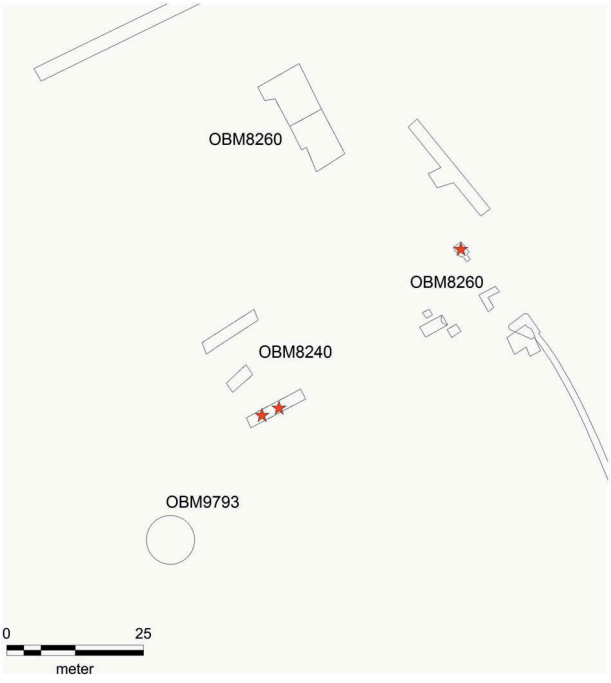

Figure 65. Plan of the excavations at Vestergade 43–49. The stars mark the positions of three pits without brick/tile containing sherds of Baltic ware pottery. Black line: Trench boundary. Drawing: Mads Runge.

Figure 66. Plan of the excavation at Skt. Knuds Plads I (OBM 9784). Black: Postholes and possible wall trench. Solid grey lines: Other features and structures. Broken grey lines: Trench boundary. Drawing: Mads Runge.

Skt. Knuds plads

Through excavations associated with narrow trenches and minor test pits undertaken in the area between the cathedral and the town hall, parts of the two former churchyards have been exposed that belong to, respectively, St Canute's Church and St Alban's Church (Skt. Knuds Plads, OBM 9784, and Skt. Knuds Plads II, OMB 9785, 080704–100) (Figure 66). In a trial trench, a total of 18 postholes were found cut into the subsoil beneath the medieval burials. From these, it was possible to distinguish two southwest-northeast-oriented rows of, respectively, three and six postholes. About 40 m east of the postholes lay a (wall) trench running north-south, which was similarly cut into the subsoil. The excavator has suggested that these features are of Early Iron Age date, apparently due to the occurrence of a possible wall trench. There are, however, no finds from the features to confirm or refute this date (Jacobsen 2001, p. 89f.).

In another trial trench located further north and six minor test pits (OBM 9785), a row of brick-/tile-free postholes was discovered below medieval burials, cut into the subsoil (Figure 67). The postholes contained no datable

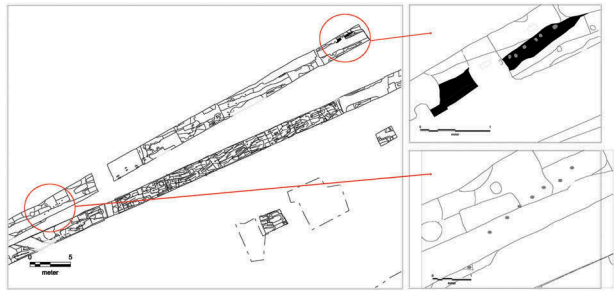

Figure 67. Plan of the excavation at Skt. Knuds Plads II (OBM 9875). Grey: Postholes. Black: Possible wall trench. Solid grey lines: Other features and structures. Broken grey lines: Trench boundary. Drawing: Mads Runge.

finds, but were overlain by a layer of travertine debris presumed to have arisen from the levelling out of stonemasons' waste from the earliest construction phase of St Canute's Church. The layer was also observed in the southern trial trench. Furthermore, in two places it was possible to demonstrate a sequence of postholes, the easternmost in a possible wall trench, which are interpreted as a fence. These postholes presumably represent a settlement that preceded the establishment of the ecclesial institutions St Alban's Church and St Canute's Church.

Filosofgangen 9–17

On the basis of the settlement traces from the Viking Age and Early Middle Ages recorded in 1984 prior to construction work at Vestergade 70–74, five trial trenches covering a total of 201 m^2 were laid out across a large area between Vestergade and Filosofgangen (OBM 8236, 080704–89) (Jacobsen 2001, p. 86) (Figure 68). In one of the trenches, a pit was investigated that resolved into three postholes, two of which contained post pipes. One of the postholes, with traces of a c. 40 cm wide post, contained soft-fired, coarsely-tempered sherds from a spherical vessel. Like the other pits in the trial trench, the feature contained brick/tile fragments. These pits can, based on finds of sherds from spherical vessels and black-fired and glazed jugs, be dated to the Middle Ages. A bone comb was found in the disturbed fill which, judging from parallels in the material from Århus Søndervold, can be assigned to the eleventh century (Andersen *et al.* 1971, p. 150ff.; Jacobsen 2001, p. 86f.) (Figure 69).

The recorded features, in the form of pits and postholes, reflect settlement activities. The presence of brick/tile, together with the majority of the finds, indicates a medieval date, though a few artefacts point further back in time.

Figure 68. Plan of the excavation at Filosofgangen 9–17. Black cross-hatching: Excavation trenches. Background map: Technical map showing buildings, roads and paths. © *The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

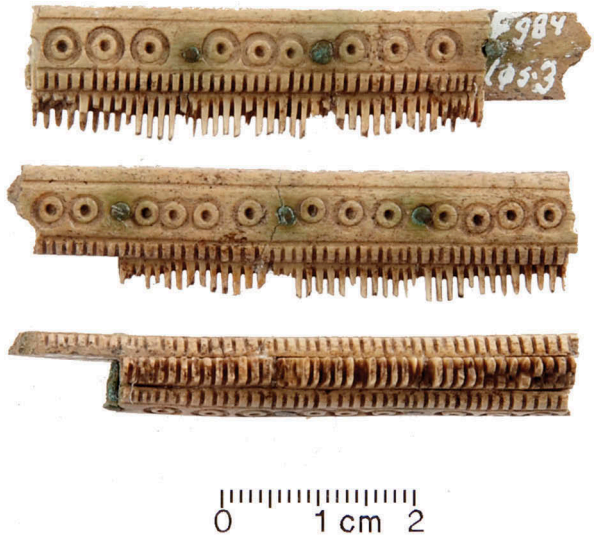

Figure 69. Fragment of a bone comb found at Filosofgangen 9–17, seen from three sides. Photo: Nermin Hasic.

Klingenberg

In the investigation at Klingenberg, four posts were found in a row, and these were interpreted as parts of a SW-NE-oriented house, K1, which can be traced over a distance of about 4 m (cf. Figure 61). There may have been a further post between the two easternmost ones, in which case it has been removed by later disturbance. It is not known whether the post row forms part of a wall or of an internal roof-bearing construction. One or two sherds (x98) found in one of the postholes are from a hemispherical vessel that can be dated to the Late Germanic Iron Age or Early Viking Age. Another posthole contained daub fragments (Jacobsen 2001, p. 95). The distance from the easternmost pit-houses at Mageløs was c. 85 m.

Klosterbakken

The investigation at Klosterbakken (OBM 9397, 080407–109) uncovered the western end of an east-west-oriented, three-aisled longhouse, K7, the eastern end of which extended beyond the excavation trench (Figure 70). The house's west gable, together with parts of its north and south walls, are preserved in the form of closely-spaced posts. Sherds of Baltic ware pottery from the house's postholes date it to the Late Viking Age, while fragments of travertine in several postholes show that the building must have been constructed in connection with, or after, the building of St Canute's Church at the end of the eleventh century. Several of the posts appear to have been replaced, showing that the building had a longer period of use. It may have been linked with the construction of St Canute's Church, but clear distinction of the secular and ecclesial structures is difficult (Jacobsen 2001, p. 95, Krogh 2001, p. 104f.).

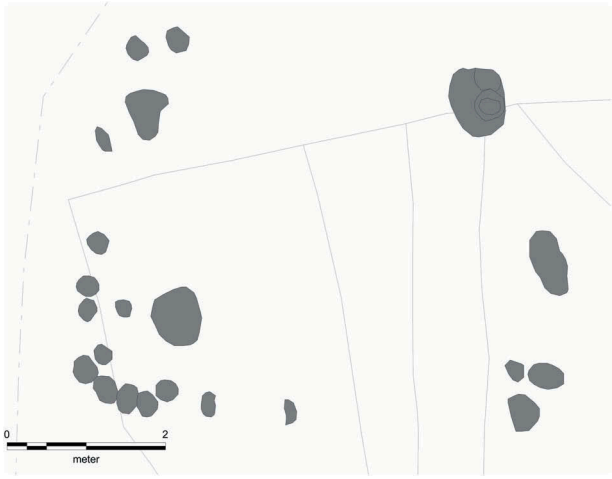

Figure 70. Plan of the excavation at Klosterbakken. Dark grey: Postholes. Solid grey lines: Other features and structures. Broken grey lines: Trench boundary. Drawing: Mads Runge.

I. Vilhelm Werners plads

The closure and abolition of the central traffic route Thomas B. Thriges Gade, and the construction of large underground car parks here, means that extensive archaeological investigations could be undertaken in 2012–2016 in a central part of Odense's early urban core. The archaeological remains date predominantly from the period AD 1000–1500, with a centre of gravity around the fourteenth century. Post-sixteenth century deposits and structures have been more or less removed during the extensive road and construction projects of recent centuries. The focal point of the investigations has been the earliest archaeological horizons, and several post-built structures, wells and pits were first identified at subsoil level.

In 2013–2014, as part of the urban renewal project, an area of c. 2600 m^2 was investigated on I. Vilhelm Werners Plads (Figure 71).[30] During the investigation, material for 42 AMS dates was obtained from primarily brick-/tile-free features and structures associated with the lowermost layers.[31] The dates were obtained for a number of postholes associated with possible house structures and for pits. The results are largely consistent with the archaeological observations at the site, i.e. they fall predominantly within the period from the eleventh century to the fourteenth century onwards. A single date does, however, lie in the Early Germanic Iron Age, and a group of dates spans the period from the late eighth to the tenth century.

Two possible house structures have been identified from the earliest phase at the site, which could predate AD 1000. One of these, APC, comprises a SW-NE-oriented, c. 20 m long row of eight posts, of which a couple, judging from their position, could represent replacements (Figure 72). The posts could represent part of a house, either as a row of roof-bearing posts or the line of a wall. Alternatively, they could be from a fence or be posts that retained horizontal rods in a light road construction (Jørgensen 1988, p. 103). The dimensions of the posts in APC are though more robust than the relatively slender posts in such a road construction. The interpretation of APC as representing a house or a fence therefore seems most plausible. Charred grain from a postholegave an AMS date of AD 777–991.[32] There are no finds from the structure.

The second possible house structure, ACU, is a single-aisled, SW-NE-oriented building, measuring 3.5–4.5 x 12–15 m and defined by 34 postholes that trace an irregular wall sequence (Figure 73). It is uncertain whether the many posts in the north wall actually represent a wall or an internal

Figure 71. Plan of the excavation at I. Vilhelm Werners Plads. Black: All features and structures linked to the excavation. Solid grey lines: Other features and structures. Broken grey lines: Trench boundary. Drawing: Mads Runge.

Figure 72. The possible house, APC, at I. Vilhelm Werners Plads showing the position of the AMS sample. Black: Postholes. Solid grey lines: Other features and structures. Broken grey lines: Trench boundary. Drawing: Mads Runge.

Figure 73. The possible house, ACU, at I. Vilhelm Werners Plads showing the position of the AMS sample. Black: Postholes. Solid grey lines: Other features and structures. Broken grey lines: Trench boundary. Drawing: Mads Runge.

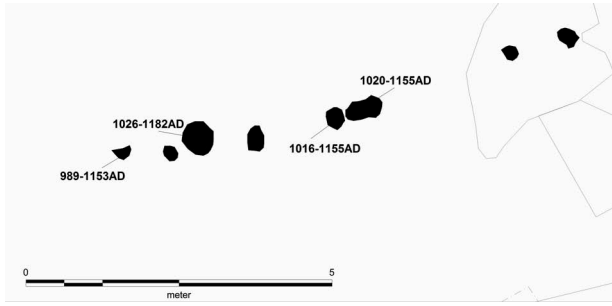

Figure 74. The possible house, ATN, at I. Vilhelm Werners Plads showing the position of the AMS sample. Black: Postholes. Solid grey lines: Other features and structures. Broken grey lines: Trench boundary. Drawing: Mads Runge.

Figure 75. Sherds, possibly from hemispherical vessel found at I. Vilhelm Werners Plads. Photo: Nermin Hasic.

construction, or whether the posts reflect the fact that the building has more than one phase. Charcoal from four of the postholes has been AMS dated with the following results: AD 770–1012, AD 771–965, AD 892–1014 and AD 1028–1184.[33] The posthole dated to AD 771–965 yielded a small belly sherd, which is difficult to date. The posthole dated to AD 892–1014 contained a few very small sherds. The largest sherd has two shallow, horizontal circumferential furrows and comes from a thin-walled, hand-shaped vessel of Baltic ware type.

The distribution of the AMS dates, the pottery from the postholes and the many postholes at the north wall could indicate that the building had several phases and consequently a long lifetime of perhaps 75–100 years. The Baltic ware pottery could originate from the demolition of the building, while the early AMS dates could be for material deposited prior to construction of the house (cf. also Hansen 2015: appendix 6). A cautious interpretation is therefore that the house was built at some time towards the end of the ninth century, as a realistic estimate of the lifetime of one phase of a building such as ACU is around 50 years. The first phase of the house presumably extended from the end of the 9th to the middle of the tenth century AD, while the second phase, when the north wall was moved about 0.75 m to the north, and a possible outshot was constructed, extends into the eleventh century.

In addition to the two possible house structures, material from a pit, has been AMS dated to AD 722–945.[34]

A third possible house structure, ATN, can be dated to the period AD 989–1182 and therefore most likely postdates AD 1000. The structure comprises a 7.8 m long, east-west-oriented row of eight posts (Figure 74). The posts stand quite close together, which could indicate that some of them have been replaced. The post row is presumed to reflect the roof-bearing construction of a two-aisled house. There are AMS dates for four of the postholes: AD 989–1153, AD 1016–1155, AD 1020–1155 and AD 1026–1182.[35] A few sherds from the postholes are of Baltic ware character.

The finds assemblage contains only sporadic traces of activity at the site in the centuries prior to AD 1000, in the form of a few possible sherds of hemispherical vessels from redeposited layers (Olesen 2014, p. 30) (Figure 75). Also recovered was a total of 1949 sherds of both secondarily-thrown and non-thrown *or* soft- or hard-fired Baltic ware pottery, represented by 308 finds numbers, corresponding to more than 21% of the total sherd assemblage, as well as 13 sherds of Pingsdorf pottery, corresponding to 0.14% of the total assemblage (Olesen 2014, p. 31f.). Pingsdorf pottery is generally dated to c. AD 900–1225/50 (Madsen 1982, p. 39f., p. 83ff.; Sanke 2001, p. 301ff.) (Figures 76 and 77).

The earliest finds from the excavations, apart from coarse-tempered handmade pottery and Baltic ware pottery, are four brooches. Two of these are pseudo-coin brooches, dated to the Late Viking Age/Early Middle Ages (Baastrup 2009, p. 217ff.). From the time around AD 1100 comes an animal brooch from the 'Aalborg group' (Bertelsen 1992, Figure 1) and a small Urnes fibula (Bertelsen 1994) (Figure 78).

Figure 76. Baltic Ware pottery found at I. Vilhelm Werners Plads. Photo: Nermin Hasic.

Figure 77. Pingsdorf pottery found at I. Vilhelm Werners Plads. Photo: Nermin Hasic.

Figure 78. Two early medieval bronze brooches found at I. Vilhelm Werners Plads. 'Aalborg brooch' (bottom). Urnes brooch (top). Photo: Nermin Hasic.

Figure 79. Selection of glass beads from I. Vilhelm Werners Plads. Photo: Nermin Hasic.

Finally, 20 glass beads were recovered, but most of these are medieval, and the rest cannot be assigned more precisely than to the period from the Roman Iron Age to the Middle Ages (Figure 79). The deposits from the Early Middle Ages were found to contain tools and waste associated with crafts such as bronze casting and textile processing. The same deposits also yielded a few weights.

Conclusions and summary of the permanent settlement from the late Iron Age and Viking Age

As is evident from the above, houses or parts of houses have been recorded in several places across the study area that must represent the existence of some form of permanent settlement prior to AD 1000 (Figure 80). There is, however, still only evidence of a couple of houses, at most, at each of the sites, but the individual localities actually lie so close to each other that several of them could have been linked and therefore reflect a somewhat larger settlement. Conversely, it has proved difficult and challenging to give very precise dates for the individual houses, and the question of contemporaneity is therefore difficult to address. For the moment, we must content ourselves with the conclusion that at the end of the Late Germanic Iron Age and in the Viking Age settlement with and without associated craft activities was distributed over a large part of the study area. Traces of trade activities, in the form of imported goods, hack silver and, not least, Arabic coins, recorded at several of the sites in the hinterland, are however absent here. As described in the introduction, a combination of a substantial size and permanence can lead to a settlement being characterised as urban.

Similarly, it is evident that the excavated sites with permanent dwelling houses, with or without links to traces of

Figure 80. Locations of sites with traces of permanent settlement, fences and pit-houses. No proper houses were identified at Vestergade 43–49, Filosofgangen 9–17 and Skomagerstræde/Overgade 1–3. Marked on Braun's prospectus of 1593. Background map: © *The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

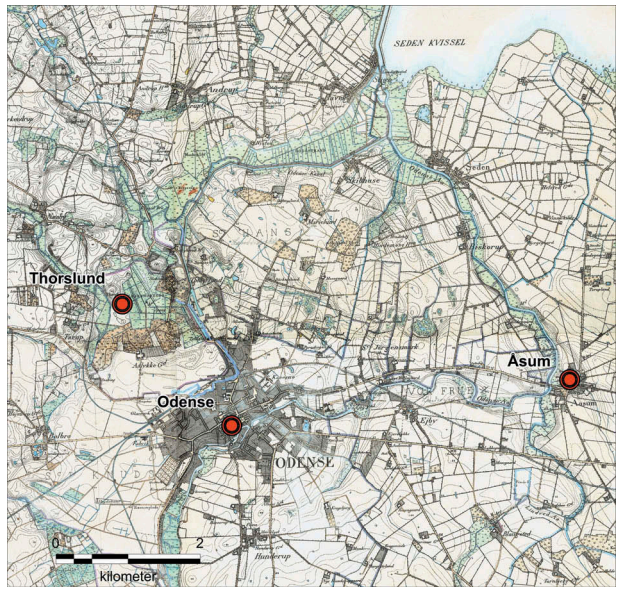

Figure 81. Odense and its immediate hinterland, with the locations of the place names Odense (Odins Vi), Thorslund and Åsum marked on the first edition ordnance map from the second half of the nineteenth century. Background map: © *The Agency for Data Supply and Efficiency*. Drawing: Mads Runge.

specialised crafts, show no clear zonation or distinction. There does, however, appear to be a tendency for pit-houses and craft activities to be concentrated in the western part of the earliest town, while the permanent settlement lacking these aspects lies to the east. It is also possible, however, that there were permanent houses in the area with workshop activities, the potential 'market place'.

Cult and religion

The place name Odense has been repeatedly associated with the presence of a pagan cult centre, Odins Vi. This cult centre has never been found and – given its presumed few archaeological remains – perhaps never will be. Odin was the god of the elite and the sacred place could therefore have occupied a significant position (Christensen 2014a, p. 188). It has already been mentioned that the AMS dates from the centuries preceding the Trelleborg phase at Nonnebakken, together with the finding of a Valkyrie brooch at the same locality, could perhaps indicate that the *vi* was located here. This interpretation concurs well with the fact that other of the Trelleborg-type fortresses have also had an initial function as a pagan cult centre (Nørlund 1948, p. 243ff., Jørgensen 2009, 2014, p. 239ff., Dobat 2014, p. 54ff., Jørgensen *et al.* 2014, Sindbæk 2014c, p. 142f.). Other possibilities are that the *vi* was located on the other side of the Odense Å, near St Alban's Church (Thrane and Porsmose 1996, p. 176), or that the term Odins Vi referred to the entire workshop area around the southern part of Odense Fjord.

Another place name with a relation to the pagan cult is Thorslund, which was associated with an island in the later drained and reclaimed lake of Næsbyhoved Sø, immediately north of Odense. The place name is known from 1245 as the term for a woodland area (Andersen 1998, p. 24, Christensen 2014a, p. 188f.), but no physical traces of a possible sacred site have been found at this location, which has now been dug away.

Finally, there is the village of Åsum, located east of Odense. Its name could refer to *as'* (god's) home, but the prefix *Ås* can also be used in reference to a topographical feature, a long, extended hill. However, it is difficult to identify a feature in the landscape that could give rise to this use of the name here (Kousgård Sørensen 1969, p. 99, Christensen 2014a, p. 188f.) (Figure 81).

Churches and churchyards[36]

St Alban's church

In a number of small excavation trenches at Albani Torv, covering a total area of 1225 m^2, investigations between 1886 and 1993 have revealed extensive traces of medieval settlement in the form of postholes, stone foundations, cultural layers, house remains and wells (OBM 8541, 080407–117) (Figure 82).

Most spectacular of these are the remains of St Alban's Church, which was abolished after the Reformation.[37] Excavations took place here in 1955 and again in 1980–83. It proved possible not only to locate the foundations of the stone church, presumed to have been constructed in the middle of the twelfth century, but also traces of no less than two wooden churches. One replaced the other, and they constitute the earliest phases of St Alban's Church (Arentoft 1985, Johannsen *et al.* 1998-2001, p. 1736ff.). In a minor excavation in 2015, in connection with the replacement of district heating pipes, further observations were

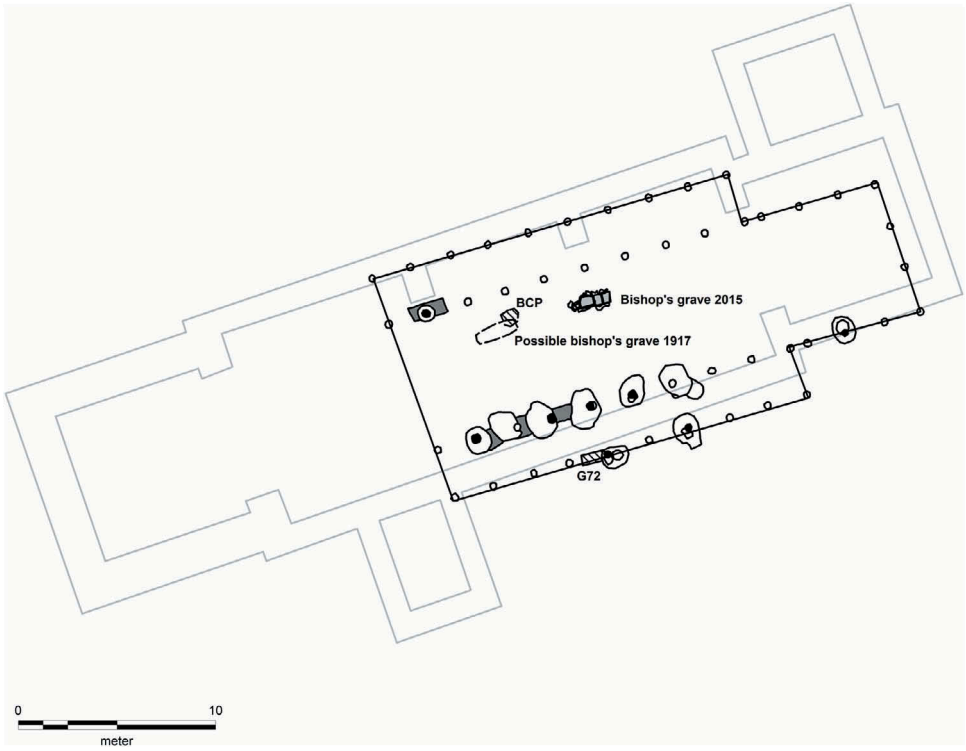

Figure 82. St Alban's church. The ground plan of the stone church is shown with grey lines, while the latest wooden church is marked with black lines. The plans are proposed interpretations (cf. Arentoft 1985, p. 17ff.). The few traces of the earliest wooden church are shown in dark grey (wall trenches and a posthole). Also shown are the bishop's grave found during the excavation in 2015 and – marked with broken lines – the possible bishop's grave encountered during an investigation in 1917. The bell-casting pit (BCP) and grave G72 are marked with crossed areas. Drawing: Mads Runge.

made with respect to the church's construction, and a bishop's grave belonging to the earliest phase of the church was investigated (Bjerregaard *et al.* 2016a, 2016b).

The earliest feature at the site is possibly a bell-casting pit. The resulting bell was c. 40 cm in diameter and c. 55 cm high, i.e. approximately the same dimensions as the Haithabu bell (Kalmring 2010, p. 440f.). The pit is difficult to date, but it is presumed to immediately precede, or be coeval with, the earliest wooden church. A thermoluminescence date of AD 1030 ± 60 was obtained from the pit in 1985 (Arentoft 1985, Johannsen *et al.* 1998–2001, p. 1736ff.). As a supplement to this date, given the limitations associated with thermoluminiscence dating (Mejdahl 1993, Runge 2009, p. 53ff.), an attempt – unfortunately unsuccessful – was made under the present project to obtain suitable material for AMS dating of the bell-casting pit.[38]

The earliest wooden church was c. 7 m wide. The chancel has not been located, but the building is unlikely to have been less than 15–20 m in length. The church possibly had two rows of internal roof-bearing posts, a clay floor and may have had stave walls. The building appears to have burned down, and it should possibly be dated to the first half or the eleventh century. It is believed to have been this church in which Canute IV was murdered (Johannsen *et al.* 1998–2001, p. 1736). The discovery in 2015 of a bishop's grave in the building firmly established that the church already had cathedral status in its earliest phase.[39] Stylistic analyses of a sacrament set, comprising a chalice and paten, placed in the grave, together with an AMS date for the skeleton, shows that the burial took place in the eleventh century.[40] Another bishop's grave found in 1917 should perhaps, in the light of the new information from the 2015 discovery, also be ascribed to the earliest wooden church (Bjerregaard *et al.* 2016a, p. 151f., 2016b, p. 4).

The fact that St Alban's Church, in its earliest phase, already functioned as a cathedral is interesting in relation to Odense's so-called 'birth certificate', the deed of gift of AD 988 from the German emperor Otto III to the Archbishop of Hamburg-Bremen. In this document, Odense – *Othenesuuig* (Odensvig) – is mentioned for the first time and is referred to as an episcopal seat. Whether Odense actually had a bishop or a cathedral at that point in time has been questioned, as the letter should probably be primarily perceived as way of underpinning the archbishop's financial situation and power in relation to the immediate environs. The discovery of the bishop's grave shows that Odense must have had a cathedral from at least the first half of the eleventh century. This is consistent with the fact that the first definite bishop of Funen, Reginbert, who presumably resided in Odense, is mentioned in AD 1020 (Henrichsen 1968, p. 118, Nyberg 1982, p. 139ff.), i.e. only 32 years after the deed of gift of AD 988. Consequently, the idea that a cathedral – the earliest phase of St Alban's Church or a

predecessor in another location – could have existed in Odense in AD 988 does not seem impossible (Albrectsen 1970, p. 128ff., Thrane *et al.* 1982, p. 113ff., Madsen 1988a, p. 97, Runge 2016, p. 29).

Regardless of whether Odense had a cathedral and a bishop in AD 988, the deed of gift demonstrates that it hosted an urban settlement of a certain size and significance at that time (Albrectsen 1970, p. 128ff., Thrane 1982, p. 113ff., Madsen 1988a, p. 97, Runge 2016, p. 29).

The next wooden church was probably built after AD 1086 and was larger than its predecessor. It was c. 11.5 m wide and had a minimum length of 28 m. The building probably had two rows of internal posts, which supported the roof, but this assumption is based a flimsy foundation. The church floor consisted of a layer of clay clods that had been stamped together. This building too appears to have burnt. The church is traditionally dated, on the basis of a coin from AD 1047–74/76 and the presence of travertine fragments in the postholes, maybe from the erection of St Canute's Church nearby, to the period after 1086. The theory is, accordingly, that the second wooden church was erected on the site of the first wooden church after the latter had burnt down in connection with the murder of Canute IV (Arentoft 1985, Johannsen *et al.* 1998–2001, p. 1736ff., Christensen and Hansen 2017, p. 14–15).

Under the auspices of the present project, in an attempt to obtain a more precise date for the earliest wooden church, AMS dates were obtained for a human femur from a grave, G72, which was disturbed during the construction of the south wall of the latest wooden church and which is therefore stratigraphically earlier than the church (Andrén 1985, p. 17ff.). The dates obtained are AD 909–1147 and AD 969–1046.[41] To take account of the reservoir effect resulting from possible consumption of food of marine origin, the dates may require correction by up to 80 radiocarbon years (Tomasz Goslar, Poznań Radiocarbon Laboratory, Poland, oral communication). The dating of G72 therefore does not seem able to provide a secure basis for adjusting the date of St Alban's Church further back in time. Neither was it possible to find material for an AMS date directly associated with the earliest phase of the church.

The stone church, which postdates the period dealt with in this study, is thought to have been constructed in the middle of the twelfth century and demolished in 1542 (Arentoft 1985, Johannsen *et al.* 1998–2001, p. 1736ff.).

St Canute's church

St Canute's Church (OBM 8200, 080407–100) has two phases. The first phase was a travertine building and the second is the existing brick-built building (Figure 83).[42] It is uncertain when the construction of St Canute's Church was begun, but it was probably one of the consequences of the murder of Canute in 1086. In 1095, Canute IV's bones were moved from St Alban's Church to the crypt beneath St Canute's Church, which at that time was under construction, and the cathedral function was transferred to St Canute's Church from then on. Throughout

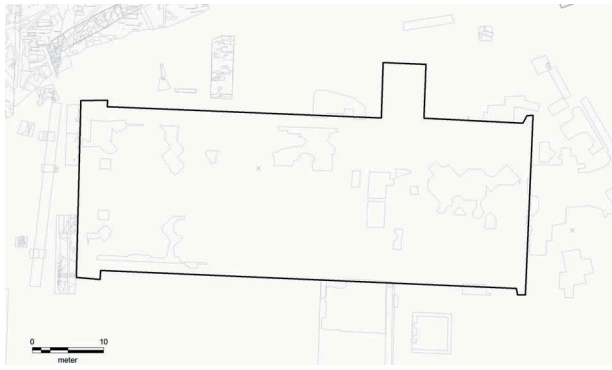

Figure 83. Plan of the excavations below and around St Canute's Church. Black lines: Outline of the present day's church. Solid grey lines: Other features and structures. Broken grey lines: Trench boundary. Drawing: Mads Runge.

the greater part of the Middle Ages, St Alban's Church and St Canute's Church therefore functioned in tandem; the former as the parish church and the latter as the cathedral (Johannsen and Johannsen 1995, p. 172ff., Christensen 1999, p. 84, Bjerregaard *et al.* 2016a, p. 141).

The travertine church was damaged by fire in 1247, but parts of it remained standing for a century or two afterwards. Between 1247 and 1499, gradually more and more brick-built elements were added, culminating in the brick-built church that constitutes the foundation of the cathedral which stands today (Johannsen and Johannsen 1995, p. 172ff.).

The churchyards for St Alban's and St Canute's churches

The churchyards for the churches of St Alban and St Canute have, based on the archaeological investigations, been localised in an arc running along the west, north and east sides of these buildings. There may also have been graves on the south side, but this is not supported by the investigation results, and the area also has a natural boundary in the form of a slope running down towards Odense Å. Large parts of the area therefore appear unsuited as a churchyard.

The extent of St Canute's churchyard is not known precisely (Christensen 1999, Krogh 2001, p. 97), but the burials could be followed on the north side of St Canute's Church over a c. 30 × 80 m area and on the west side of the church over a c. 20 × 50 m area, i.e. a total of c. 3400 m^2. The extent of St Alban's churchyard is estimated to be c. 50 × 120 m, i.e. 6000 m^2 (Pedersen and Bjerregaard 2016, p. 159).

In 1998, between the two churchyards, the foundation trench for a churchyard wall was investigated which – with the exception of a few overlying graves – had separated the two churchyards. The burials are relatively few in number here and they presumably represent the graves of monks and possibly also higher ranking individuals. At the same time, judging from the arm positions of the deceased, there is a centre of gravity in the later part of the Middle Ages. The

eastern part belonged to St Alban's Church. There are more burials here and they are consequently spaced much closer together and in several overlying layers. The burials presumably reflect the average population, as indicated by the presence of child graves. The centre of gravity here, again based on the arm positions, lies in the beginning of the Middle Ages (Kieffer-Olsen 1993, p. 21ff., Christensen 1999).

The investigations of the two churchyards have been undertaken in a series of stages:

(1) In 1998, in two narrow trench excavations and several minor test pits, a total area of just less than 400 m^2 was investigated between the cathedral and the town hall. In all, a total of 344 burials from the Middle Ages and modern times were located. There were 220 graves in St Alban's churchyard and 124 in St Canute's churchyard (Christensen 1999).
(2) In 2000, an area of 1750 m^2 of the churchyard for St Canute's Church was excavated, revealing more than 500 medieval burials (Krogh 2001).
(3) During ongoing investigations of Thomas B. Thriges Gade, east of the former St Alban's Church, in 2015 and 2016 an area of c. 600 m^2 of the churchyard for St Alban's Church, with c. 300 burials, was investigated (Pedersen and Bjerregaard 2016).

Consequently, a total of c. 800 m^2 and c. 520 graves have been excavated in St Alban's churchyard, together with just less than 2000 m^2 and c. 620 graves at St Canute's churchyard (Figure 84). The churchyard for St Alban's Church functioned throughout the Middle Ages, while the churchyard for St Canute's Church was in use from the end of the eleventh century until the beginning of the nineteenth century.

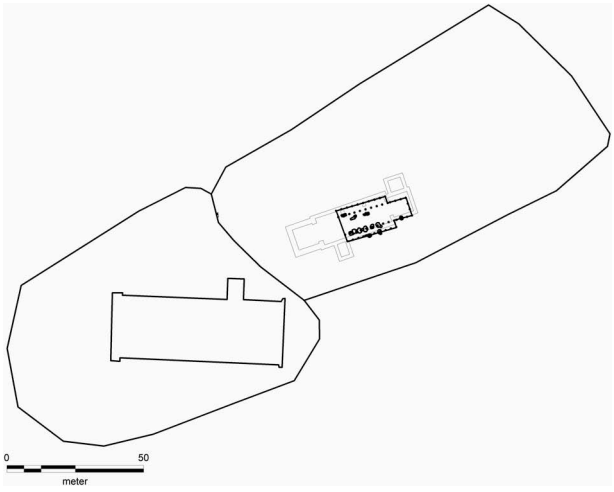

Figure 84. Plan of the excavation at St Alban (right) and St Canute's (left) churches and churchyards. The extent of the two churchyards shown is approximate. Drawing: Mads Runge.

Figure 85. St Canute's churchyard. The 13 graves (black) and the positions of the AMS samples (stars). Solid grey lines: Other features and structures. Drawing: Mads Runge.

A cluster of 13 graves, three of which were of children, in the northwest part of the churchyard for St Canute's Church, were overlain by the travertine debris layer that is thought to be associated with the construction of the earliest phase of the church (Figure 85). The graves are therefore earlier than the late eleventh century, when construction of the travertine church commenced, and they could reflect an earlier or earliest churchyard phase. As the graves appeared to be roughly coeval, a preliminary interpretation was that they may represent Canute IV's housecarls who were killed during the attack on the king in AD 1086. This theory was, however, swiftly abandoned due to the presence of women and children among the 13 interred individuals (Krogh 2001, p. 99f.). AMS dates obtained from four of the 13 graves under the auspices of the present project gave the following results[43]:

- Grave QA (x781): Arm position A, male 25–35 years old. Stratigraphically, QA is probably one of the churchyard's earliest graves. AD 895–1021.
- Grave GGA (x2181): Arm position A, presumably male 25–35 years old. The grave had traces of a coffin and was overlain by the travertine layer. AD 772–967.
- Grave GAB (x2200): Arm position A, probably male 30–45 years old. Coffin traces, a little travertine in the fill. AD 887–1013.

- Grave GFS (x2379): Arm position A, female 25–35 years old. Coffin traces. AD 989–1153.

Due to the reservoir effect resulting from the possible consumption of food of marine origin, the dates may require correction by up to 80 radiocarbon years (Tomasz Goslar, Poznań Radiocarbon Laboratory, Poland, oral communication). The dates partly confirm that the graves belong to the earliest phase of the churchyard, no later than the end of the eleventh century, but the results are by no means unequivocal.

Other sources to the earliest history of Odense

Stray finds

While features and structures provide solid evidence that activities of some kind or other have taken place, single finds lacking a secure context can only very tentatively be used to say something definite about contemporaneous activities. A single stray find could for example have been transported to its find spot from a completely different locality. In the case of the centre of Odense, this is a very likely scenario, considering the many extensive construction and development works that have taken place during the last century. At a very local level, bioturbation can have effected both vertical and horizontal displacement.

Despite the limitations in their value as evidence, single finds from Odense, dated to the period from the Late Germanic Iron Age to the earliest Middle Ages, are examined in the following in order to complete the account of the archaeological record relating to the description of the earliest Odense.

From Fisketorvet (OBM 446, OBM 9780, 080407–25), which has roots extending back to the Middle Ages (Christensen 1988, p. 53ff.), there is a stray find of a perforated, polished stone, resembling a loom weight. Its surface bears geometric ornamentation, an inscription of rune-like characters and an animal head in Ringrike or Urnes style, and it is dated to no earlier than the eleventh–twelfth

Figure 86. Perforated, polished stone found at Fisketorvet. The measuring stick is 5 cm. Photo: CC-BY-SA Emilie Howe Gersager, The Danish National Museum.

Figure 87. Gold-foil bead found at Fisketorvet. Photo: Nermin Hasic.

Figure 88. Beak-shaped brooch found at Skt. Jørgensgården. Photo: Nermin Hasic.

centuries (Anne Pedersen, National Museum of Denmark: oral communication). From the same locality, there is a stray find of a bead with gold foil (Jeppesen 1981, p. 112, Christensen 1988, p. 32), which is from the late tenth century or later (Figures 86 and 87).

From Skt. Jørgensgården (OBM 8215, 080407–159), c. 250 m east of the study area, comes a fragment of a beaked brooch dated to the Late Germanic Iron Age (Arentoft 1999, p. 171) (Figure 88), as well as large

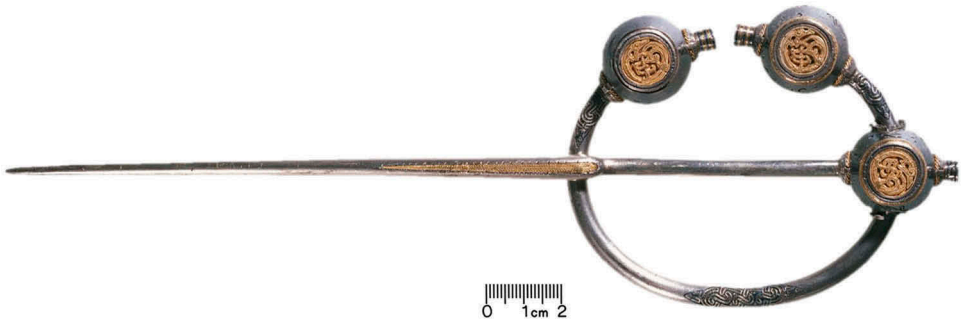

Figure 89. Ring-headed pin found at Møllerløkken. Photo: The Danish National Museum.

Figure 90. Ring-headed pin found in St Canute's churchyard. Photo: Nermin Hasic.

parts of a soft-fired, hand-formed vessel (Arentoft 1999, p. 148).

From Møllerløkken (OBM1630, 080307–23), just less than 1 km east of the study area, there is a presumably Norwegian silver ring-headed pin from the beginning of the tenth century (Skovmand 1942, p. 85, no. 29) (Figure 89). The pin was found on an area that slopes down to the north side of Odense Å and at a distance of 100–200 m from the latter.

From St Canute's churchyard, there is a bronze ring-headed pin, found in a secondary context in a medieval inhumation grave (Figure 90). The pin has a loop head (cf. Fanning 1990) and is broadly dated to the Viking Age.

Selected cartographic and written sources relating to the earliest history of Odense

Odense is mentioned in several medieval documents, most of which revolve around the murder of Canute IV and his subsequent canonisation. Information on the town's topography and layout is, on the other hand, sparse and scattered. In the following, the most relevant of these sources, in the present context, will be outlined, i.e. sources which provide fairly reliable information on Odense's topography and possibly also the appearance of St Alban's Church. Sources such as Knýtlinga Saga (Ægidius 1977), which to a major extent provide a dramatic description of Canute IV/Canute the Holy's life and work, have been omitted.

Odense's 'birth certificate'

Odense's so-called 'birth certificate' dates from AD 988 and is a deed of gift from the German emperor Otto III to the Archbishop of Hamburg-Bremen (Christensen and Nielsen 1975, p. 114, no. 343) (cf. Figure 1). In this document, Odense – *Othenesuuig* (Odensvig) – is mentioned for the first time and is referred to as a bishopric. Whether Odense actually had a bishop or a cathedral at this point in time is much debated as the document should probably be perceived primarily as a means of bolstering the archbishop's finances and power in relation to the immediate surroundings (Albrectsen 1970, p. 128ff., Thrane *et al.* 1982, p. 113ff., Madsen 1988a, p. 97, Runge 2016, p. 29).

Saxo's Gesta Danorum (deeds of the Danes)

This text is from the twelfth century and is only preserved in fragments. The manuscript was printed in Latin in 1514. The 11th book, chapter 11, 13–15, deals with the events leading up to, during and after the murder of Canute IV in 1086 in St Alban's Church. The information on Odense is limited to references to the church and the suggestion of a nearby churchyard. The church is said to have wooden walls and windows and Canute is said to have been killed inside the church, by the altar (Zeeberg 2000, p. 86ff.).

Ælnoth's chronicle

The text is from the decades around AD 1100 and, among other things, also provides a detailed account of Canute's murder. The royal residence is said to be near St Alban's Church. The church is also referred to here as a wooden building with windows. Moreover, it is stated that the church contains a relic casket holding remains of the martyrs Alban and Osvald. It also describes how Canute lay buried for nine years beneath the church floor in St Alban's Church before his remains were moved to a stone cist in the crypt of the still unfinished St Canute's Church. In 1101, his bones were

moved into a magnificent casket lined with silk (Albrectsen 1984, p. 79ff.).

Passio Sancti Kanuti Regis et Martyris (passion of St Canute, king and martyr)

The text is from the first half of the thirteenth century and describes the murder of Canute. It states, for example, that the murder took place in St Alban's Church, which at that time was the bishop's church, i.e. the cathedral (Johannsen *et al.* 1998–2001, p. 173; Bjerregaard *et al.* 2016a, p. 141).

Adam of Bremen

Around 1075, Adam of Bremen describes the archbishopric of Hamburg-Bremen and the history of its archbishops. Adam addresses, among other things, ecclesial-political interactions between the archbishopric Hamburg-Bremen and an independent Danish bishopric. Adam mentions Odense as a large town ('*Odansue* … *magna civitas*') (Henrichsen 1968, p. 65, Bjerregaard *et al.* 2016a, p. 151f.).

Braun's prospectus

This prospectus is from 1593 and is therefore considerably later than the period dealt with here. Nevertheless, the map is a significant source of information on the early structure of the town. Nonnebakken, St Alban's Church, St Canute's Church and the earliest streets and roads are all drawn in (Jørgensen, O. 1981) (see Figure 3). The prospectus also illuminates important aspects of the town's immediate hinterland, for example roads and the complete lack of settlement in the area to the south of Odense Å (Füssel 2008, p. 184).