# Bronze Age Settlement and Land-Use in Thy, Northwest Denmark

Vol. I

# Bronze Age Settlement and Land-Use in Thy, Northwest Denmark

## Vol. I

Edited by Jens-Henrik Bech, Berit Valentin Eriksen
& Kristian Kristiansen

Museum Thy

Jutland Archaeological Society

Bronze Age Settlement and Land-Use in Thy, Northwest Denmark, Vol. I



Layout and cover: Jens Nygaard and Ea Rasmussen
Translation, language revision and proofreading:
Anne Bloch and David Earle Robinson, HSLS, Ebeltoft
Graphics: Lars Foged Thomsen
Excavation photos: Museum Thy

E-book production by Narayana Press, Gylling
Type: ITC New Baskerville

Jutland Archaeological Society Publications 102

ISBN: 978-87-93423-30-5
ISSN: 0107-2854

Jutland Archaeological Society
Moesgård
DK-8270 Højbjerg

Distribution:
Aarhus University Press
Finlandsgade 29
DK-8200 Århus N

Published with the support of:

Farumgaard-Fonden
Stiftelsen Riksbankens Jubileumsfond

Front cover: Bronze Age barrows at Elsted, central Thy. Photo: J.-H. Bech.

# Contents

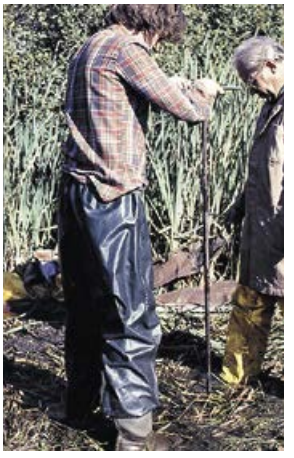














BACK TO CONTENT

# Preface

*Jens-Henrik Bech, Berit Valentin Eriksen & Kristian Kristiansen*

The 'Thy Project' is the convenient shorthand term we have always employed for the Thy Archaeological Project, which is central to this book (for English speakers, Thy [tˢy:ˀ] is pronounced with a hard 'T' – the 'h' is silent' – rather like 'Tu', with stress on the T; our American friends never quite learned it). The Thy Archaeological Project began as a collaborative, interdisciplinary and international field project that ran from 1990 to 1997 (first synthesis published in 1998 by Earle *et al.*; further publications up to 2010 cf. Earle & Kristiansen 2010, appendices 2-3). In the early years, the excavation focus was mainly on Late Neolithic settlements in central Thy (published in 2008 by Martinez). But from 1993 onwards, it shifted to a number of Bronze Age settlements in central and northern Thy. The fieldwork was succeeded by a long post-excavation analysis phase – when new project members were added to fill gaps and address specific aspects – culminating, after 20 years, in this two-volume publication of the Bronze Age evidence. The project's three strands of collaboration, together with its philosophy and development, will be briefly outlined here. They reflect the circumstances and conditions that face all modern archaeological field projects, and it is hoped that future projects may benefit from our experience in the Thy Project (see also Preface to Earle & Kristiansen 2010).

The first collaborative strand involved ten years of cooperation (1983-1995) between the National Agency for Nature Conservation and Forestry, Division for Archaeological Heritage (now The Danish Agency for Culture and Palaces, the former institution headed until 1994 by Kristian Kristiansen), and the Geological Survey of Denmark, Division for Geo-botanical Research (now The Geological Survey of Denmark and Greenland, headed by Svend Thorkild Andersen† during the same period). This collaboration was aimed at producing regional pollen diagrams for areas of dense prehistoric settlement across Denmark. The Division for Archaeological Heritage (who financed the work), and the Division for Geo-botanical research (who undertook the analyses), set up a long-term plan to cover the entire country, which resulted in a series of modern pollen diagrams produced by Svend Thorkild Andersen, Bent Aaby, Bent Odgaard and later also Peter Rasmussen. These pollen diagrams revealed the impact of prehistoric settlements on the vegetation in south Jutland, Djursland, northern Jutland, central Zealand and, finally, in Thy. Subsequently, local pollen data from Bronze Age barrows in Thy (published in Andersen 1999) and from megalithic monuments were added, too (published in Andersen 1992). However, the Thy pollen diagrams (one from Hassing Huse Mose and one from Ove Sø, the latter identical to the former and therefore only published in an internal report) were remarkable in showing a major and sudden 'landnam' around 2700 BC. This was linked to the Single Grave culture, which created an open landscape for grazing animals over a period of less than a century. A second clearance episode was evident in the Bronze Age, beginning around 1500 BC, which eliminated most of the remaining forests. They represent one of the most dramatic regional pollen sequences in northern Europe, but they make perfect sense archaeologically. Thy is renowned for its thousands of large Bronze Age barrows, which still crown the landscape and make it one of the most authentic barrow landscapes in Europe. The region has also produced some of the richest Bronze Age burials, especially from period III. The obvious next step was therefore to undertake an archaeological survey within the 10 km catchment area for the pollen diagram to gain an overview of the settlements. The results of this work were supplemented by local pollen data from excavated barrows (Andersen 1999), and later by pollen analyses of sediments associated with the buried Bronze Age fields excavated at Bjerre Enge, northern Thy, in order to gain an understanding of the local subsistence and landscape development (Andersen vol. I, chap. 9). This environmental strand was later developed further by several other scientists, both during and after the excavations.



BACK TO CONTENT

The second collaborative strand involved the regional archaeological museum, Museum Thy, (formerly: Museet for Thy og Vester Hanherred) personified by Jens-Henrik Bech, who agreed to join the project, taking on responsibility for curation of finds and participating in the planning and implementation of the project, as well as the publication of its findings. Through the participation of Jens-Henrik Bech, and for long periods also his wife, Anne-Louise Haack Olsen, the museum thereby became engaged as a full project partner. This led on to the third strand of international collaboration. Jens-Henrik and Kristian Kristiansen soon realised that international partners were needed who could bring in students for field surveys and excavations. They invited Timothy Earle (UCLA, later Northwestern University, Chigaco), who fortunately for us had just been forced by local circumstances in Peru to terminate his field project there, to join the project team. He was therefore ready and prepared to bring his team of colleagues and students (e.g. John Steinberg and Peter Aperlo) to Thy, and to a completely different experience. However, he was the first to point out that we could not simply machine off the plough soil to gain access to the Bronze Age post holes, because the plough soil held what was left of Bronze Age cultural layers. Together with his graduate student John Steinberg, he designed a plough-soil research programme. Soon afterwards, we also invited Michael Rowlands from University College London to join us. He brought with him his graduate student Nick Thorpe, who would soon take over the field survey work with his team of students, when Michael had to leave for fieldwork in Africa. Between 1994 and 1997, the continuing survey work was led by Danish student Jørgen Westphal. Then, from 1994, when Kristian became Professor of Archaeology at the University of Gothenburg, student teams from Sweden were also brought to participate in the project.

It was inevitable that the project would benefit from involvement in the on-going rescue excavations of Bronze Age settlements undertaken by Museum Thy. The museum, in turn, would profit from the project's package of survey techniques, from plough-zone sampling to soil sieving and flotation. Collaboration with rescue archaeology led us first to the Aas ridge and Martin Mikkelsen, who soon after joined the project and was instrumental in excavating the Legaard site with Kristian Kristiansen and his team from 1996-1997. Then newly discovered Bronze Age sites with preservation of wood led us to Bjerre Enge in northern Thy, where rescue excavations on a former raised seabed had uncovered a rich Bronze Age cultural landscape that even included Bronze Age fields represented by ard marks. Anne-Louise Haack Olsen, from the museum, was part of the team as on-site director, together with Tim Earle at Bjerre 6 (1994-1995) and Bjerre 7 (1996-1997). As a result, we were finally able to cover the entire Bronze Age sequence of settlements by combining these three areas – Sønderhå and the Legaard settlement, the Aas Ridge, on the Limfjord coast, and the Bjerre Enge settlement, close to the North Sea. We officially terminated the fieldwork part of the project in 1997.

Berit Valentin Eriksen (now Centre for Baltic and Scandinavian Archaeology (ZBSA), Schleswig) and Inge Kjær Kristensen (now Museum Salling) joined the project at an early stage to analyse the large flint and pottery assemblages resulting from the excavations (Kristensen vol. II, chap. 18; Eriksen vol. II, chap. 21). During and after the Bjerre excavations a number of colleagues from a whole range of Danish and foreign institutions also contributed to the project with different kinds of supplementary analyses ranging from geological, archaeobotanical and archaeozoological subjects and much more. This involved Marianne Rasmussen from The Danish Agency for Culture and Palaces (vol. I, chap. 2), Jesper Olsen, Marie Kanstrup, Helle Juel Jensen, Kristian Dalsgaard & Mette Westergaard Nielsen from Aarhus University (vol. I, chap. 2; vol. II, chap. 23 and 26), Kristian Søgaard, Charlie Christensen, Morten Fischer Mortensen, Peter Steen Henriksen, David Earle Robinson, Jan Harild, Annine Moltsen, Kjeld Christensen, Aoife Daly, Orla Hylleberg Eriksen and Claus Malmros from The National Museum (vol. I, chap. 8, 10; vol. II, chap. 25), Georg Nyegaard from The National Museum of Greenland (vol. II, chap. 27), Kaj Strand Petersen† and Frants von Platen-Hallermund from The Geological Survey of Denmark and Greenland (vol. I, chap. 7), Kaare Lund Rasmussen from The University of Southern Denmark (vol. II, chap. 19), Hans Peter Stika from The University of Hohenheim, Stuttgart (vol. II, chap. 31) and Svend Isaksson from Stockholm University (chap. II, chap. 20). Finally, the archaeologist and architect Bente Draiby made reconstructional drawings of some Bronze Age houses from Thy (e.g. contribution in vol. II, chap. 29).

The Thy Project has a remarkable history of constructing new archaeological machines. Inspired by a 'home-built' prototype at Museum Thy, John Steinberg, who carried out an extensive and laborious programme of plough-soil sampling for his PhD research (see Earle & Kristiansen 2010, appendix 2), constructed a highly efficient sieving machine that freed labour to speed up the sampling process (published in his award-winning Antiquity article in 1996). Similarly, to support another of Tim Earle's students, Kristina Kelertas, who undertook archaeobotanical analyses for her PhD research (see Earle & Kristiansen 2010, appendix 2), he called upon his colleague Christine Hastorf, who came to Thy and had a flotation machine constructed based on her latest best experience.



BACK TO CONTENT

It is our basic philosophy that the social and academic lives of a project are intrinsically linked. When working in Thy, professors and students alike lived together and shared the sometimes primitive conditions encountered during the project. The small-talk around the dinner table, which often developed into interesting conversations, combined with regular weekly briefings and evaluations, which also included the airing of complaints, helped to keep the project team motivated. We established various traditions, such as a regular mini-conference, with presentations by members of the team and invited guests, and the annual eel dinner also became an institution (tragically eels are now nearing extinction). We also tested the Bronze Age cooking pits, with the most delicious results, when Jens-Henrik Bech, at his 50th birthday party, fed the team with meat cooked the Bronze Age way.

Once the fieldwork came to an end, the long, laborious process of post-excavation analyses began (articles were published along the way, especially pollen research and some archaeological syntheses, see below). Jens-Henrik Bech took over the leadership of this process, later aided by Berit Valentin Eriksen and Kristian Kristiansen, bringing in new members where required, organising regular meetings of the project team to present and discuss results, and applying for grants to allow participants to finalise their contributions. New results from on-going excavations were also added along the way.

The present publication is the result of these efforts to shed light on the Bronze Age in Thy from many different angles and involving as broad a spectrum of disciplines as possible and to place the archaeology of the area in both a regional and a broader supraregional, North Sea context. A total of 31 main and co-authors made this possible and contributed in the true spirit of the Thy Project to create this multi-author and multi-disciplinary work, which also includes two major 'hard core' artefact studies based on the challenging Bronze Age pottery from Bjerre and Legaard (Kristensen vol. II, chaps. 18 and 30) and the large flint assemblage from Bjerre (Eriksen vol. II, chap. 21).

On a final note, we wish to thank all those involved during the different stages of the project, from field research over post-excavation analyses to publication. Most notably the grant-supporting institutions, Museum Thy, the National Agency for Nature Conservation and Forestry, the Geological Survey of Denmark, the National Museum of Denmark, the National Science Foundation in the USA (DBS 9207082, DBS 9116921), the British Academy's Small Grants in Archaeology, the Swedish Riksbankens Jubileumsfond, who financed this publication, together with the Danish Farumgaard-Foundation, the Danish Research Council for the Humanities, the Danish Agency for Culture and Palaces, Queen Margrethe II's Archaeological Foundation, the Beckett-Foundation, the Elisabeth Munksgaard Foundation and the Centre for Baltic and Scandinavian Archaeology in Schleswig.

## Acknowledgements

We wish to direct special thanks to the following for making important contributions to the production of this book: Anne Bloch Jørgensen and David Earle Robinson (linguistic revision and translation), Nils Wolpert (copy-editing), Mette Roesgaard Hansen (GIS illustrations), Rich Potter (digital illustrations), Beth Møller† and Jeppe Boel Jepsen (object drawings), Bente Philippsen ($^{14}$C modelling and calibrations), Claudia Janke and Klaus Madsen (object photographs), Anne-Louise Haack Olsen (GIS illustrations and much more), Ea Rasmussen, Jens Nygaard and Lars Foged Thomsen (layout and graphic design).

## References

Andersen, S.T. 1992. Early and Middle Neolithic agriculture in Denmark: Pollen spectra from soils in burials mounds of the Funnel Beaker Culture. *Journal of European Archaeology* 1, pp. 153-181.

Andersen, S.T. 1995. History of vegetation and agriculture at Hassing Huse Mose, Thy, northwest Denmark, since the Ice Age. *Journal of Danish Archaeology* 11 (1992/93), pp. 57-79.

Andersen, S.T. 1999. Pollen Analyses from Early Bronze Age Barrows in Thy. *Journal of Danish Archaeology* 13 (1996/97), pp. 7-17.

Earle, T., J.-H. Bech, K. Kristiansen, P. Aperlo, K. Kelertas & J. Steinberg 1998. The political economy of Late Neolithic and Early Bronze Age society: The Thy Archaeological Project. *Norwegian Archaeological Review* 31/1, pp. 1-28.

Earle, T. & K. Kristiansen (eds.) 2010. *Organizing Bronze Age Societies,* The Mediterranean, Central Europe, and Scandinavia Compared. Cambridge: Cambridge University Press.

Martinéz, M.P.P. 2008 Bell Beaker communities in Thy: The first Bronze Age society in Denmark. *Norwegian Archaeological Review* 41(2), pp. 71-100.

Steinberg, J. 1996 Ploughzone sampling in Denmark: isolating and interpreting site signatures from disturbed contexts. *Antiquity* vol. 70, pp. 368-392.



BACK TO CONTENT

*Burial mounds at Dollerup to the east of the Bronze Age site Klostergård in central Thy (cf. Olsen vol. II, chap. 32). Photo: J.-H. Bech.*



BACK TO CONTENT

Chapter 1

# The Thy Archaeological Project

## Results and reflections from an international archaeological project[1]

*Jens-Henrik Bech*

## Introduction

Thy, in northwest Jutland, is bordered to the west by the North Sea and to the east and south by the Limfjord. Thousands of barrows were constructed here, particularly during Early Bronze Age periods II and III (from 1500 to 1100 BC). Wherever one turns, one or more of these burial mounds meets the eye on the horizon.

With its rich legacy of burial sites, Thy was ideal for a diachronic settlement project aimed at testing interpretations of Bronze Age society against the evidence of settlement and environment, and this was the starting point for the Thy Archaeological Project (henceforth referred to as TAP).

TAP was an international venture bringing together archaeologists from Denmark, the United States, Great Britain and Sweden for fieldwork and surveys during the years 1990-1997. Main themes in the project were settlement studies, household archaeology, social organisation and the ecological background – all seen in a long-term perspective. The project was originally planned to cover developments through a very long chronological sequence, from the beginning of the Neolithic period (4000 BC) to AD 1800, but faced with reality the main focus was subsequently narrowed down to the Late Neolithic and Bronze Age (2350-500 BC).

The short presentation of the project given in this chapter will mainly deal with some of the results and data from surveys (for a more comprehensive presentation of the project and some of the main results see Earle *et al.* 1998; Earle & Kristiansen 2010; see also Thorpe 1997; Kelertas 1997; Steinberg 1996, 1997; Kristiansen 1998; Bech 1998, 2003; Bech & Mikkelsen 1999).

## Pollen analysis

In the planning of TAP as an interdisciplinary archaeological settlement project, great emphasis was placed on pollen-analytical and archaeobotanical studies in order to understand the vegetational history of the region and the agricultural exploitation of the area in prehistory. The pollen-analytical data came first of all from two regional pollen diagrams: one from a bog, Hassing Huse Mose, and the other from lake sediments in a lake, Ove Sø, both in central Thy (fig. 1.1) (Andersen 1995a-b). The distance between the two sites where the pollen cores were taken was only 3.8 km. The pollen diagrams demonstrated a major *landnam* during the early 3rd millennium BC, corresponding to the Bottom Grave period of the Single Grave culture (fig. 1.2). This is one of the most massive forest clearances seen in northern Europe (Kristiansen 1998), and the pollen spectra clearly show that woodland was removed and replaced by open land with fields and pastures during the Middle and Late Neolithic. Treeless areas increasingly expanded in the Early Bronze Age (1700-1100 BC), when trees became mainly restricted to wetlands. As will be demonstrated in the subsequent chapters, the archaeological data also indicate that as early as Early Bronze Age period II, problems of procuring good-quality building timber were a matter of concern to the Bronze Age people of Thy. Supplementary pollen spectra from soils sealed within or under Early Bronze Age mounds tell the same story of extensive land-use, perhaps mainly based on animal husbandry (Andersen 1999). In the Late Bronze Age (1100-500 BC), treeless areas continued to be widespread, although some recovery of secondary forest took place. This development continued into the Early Iron Age, when the extensive use in northwest Jutland of houses with turf walls during the period 500 BC to AD 200 no doubt reflects a lack of timber and the openness of this wind-exposed landscape facing the North Sea.

How are these pollen-analytical conclusions about land-use reflected in the archaeological material? The major decline in woodland, especially during the Early Bronze Age, is no doubt reflected indirectly in the number of burial mounds, which had to be seen in an open landscape – but what about settlements from the



BACK TO CONTENT


*Figure 1.1. The location of Thy, Denmark.*

same period? When TAP began, knowledge of Bronze Age sites in Thy was almost non-existent (Bertelsen *et al.* 1996), and there were also problems with the Neolithic period, although finds in museums and in private collections indicated a potential in this respect (Steinberg 1997). Various methods can be used to shed light on incongruities between the pollen-analytical evidence and the archaeological record: recording of private collections of artefacts, field surveys, shovel tests, plough-zone screening and ultimately excavation – both trial and full-scale. Each of these methods has various different limitations, but together they supplement each other. In the following, results mainly derived from field surveys will be used to show the archaeological evidence for human impact on the environment during the Neolithic and Bronze Age periods, especially with regard to the 'missing' Bronze Age settlements.

## Field surveys

Regional pollen diagrams are now believed to reflect the general vegetational history of the landscape within a radius of 5 km of the sampling site (Odgaard & Rasmussen 2000). This is a reduction relative to earlier views (Andersen *et al.* 1983), which is the reason why a 10 km circle was originally chosen by TAP as the limit for the primary research area shown in figure 1.3. Two of the main areas for surveys were located within this 10 km circle: one inland (Sønderhå/Snedsted/Hørsted – area 1) and the other along the coast of the Limfjord (Heltborg – area 2). A further Limfjord area was chosen to the north, outside the circle (Sjørring/Tilsted – area 3), to reflect the broad landscape variation of Thy's moraine soils, which primarily consist of sandy till in inland areas and mainly clay-rich till along the Limfjord (Pedersen & Petersen 1989; see also Bech & Rasmussen vol. I, chap. 2, fig. 2.1).

## Survey findings

A total area of 8.4 km$^2$ was surveyed using a standard procedure of line walking at 10 m intervals and detailed recording in 50 x 50 m blocks at the sites.[2] Of the collected artefacts dating from the Late Bronze Age and the Iron Age, more than 95% comprised pottery, while a very different situation characterised the material from earlier periods, with flint flakes and flint tools making up the bulk of the survey finds. Unfortunately, although 3684 surface finds are recorded in the TAP database, only an extremely small proportion of these is datable to one main period. As illustrated in figure 1.4, 16% of the datable stone artefacts belong to the Funnel Beaker culture (AYT,) while only 9% have a clear Late Neolithic (AYS) date. The majority of the stone artefacts can therefore only be dated in more general terms. One large group of finds consists of small fragments of polished flint axes and other artefacts that cannot be dated more precisely than to the Neolithic in general (AYX). This group includes 22% of the survey finds, while almost 40% are only datable to either the Late Neolithic or the Early Bronze Age (AYS/BÆX). The final group consists of artefacts such as daggers, sickles and arrowheads made in bifacial technique – a technique that was in use in the Late Neolithic and the Early Bronze Age. Since survey finds normally consist of fragments, it is only possible in some cases to narrow down the dating of these to one of the two periods. In order to use these latter finds in the calculations below, we therefore proposed the hypothesis that half of the total amount of the AYS/BÆX artefacts date from the Late Neolithic and the other half from the Early Bronze Age. In the same way it is presumed that



BACK TO CONTENT

half of the total artefacts dated to the Neolithic in general (AYX) belong to the Funnel Beaker or the Single Grave culture (AYT/AYE), while the other half is from the Late Neolithic (AYS). By doing this, it becomes clear that the number of estimated Late Neolithic artefacts is much greater than the number of artefacts from the earlier part of the Neolithic. This becomes even more evident when the length of the chronological periods in question is taken into account. Together, the Funnel Beaker culture and the Single Grave culture lasted about 1500 years, while the Late Neolithic had only about half this duration. The number of estimated artefacts per year in the Late Neolithic is therefore about three times as high as the corresponding figure for the earlier periods. This picture does not change significantly if the Neolithic artefacts in the AYX group are also divided up according to the length of the chronological periods, so that two thirds of the AYX finds go to the earlier chronological groups (instead of half the total amount to each of the groups as described above).

This difference between the number of survey finds from the early and late part of the Neolithic is important and corresponds very well with the number of sites from the two periods. The fact that survey finds from the Bronze Age are almost as unusual as finds from the Funnel Beaker and Single Grave cultures is primarily due to the exclusion of pottery from the calculations. As will become clear below, sites from the Late Bronze Age and Early Iron Age with ploughed-up potsherds were frequently encountered (see fig. 1.5A-B).

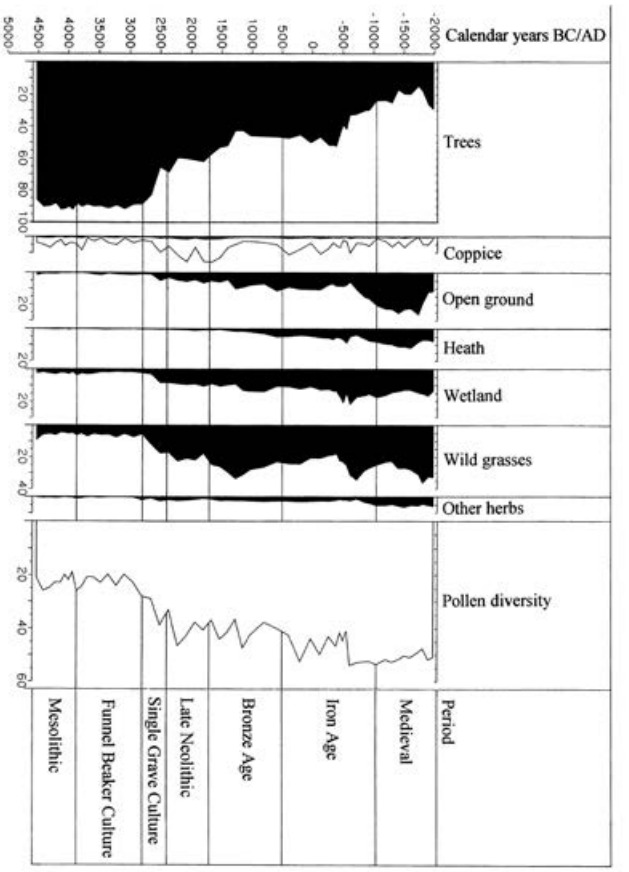



*Figure 1.2. Ove Sø. Pollen spectra for the various plant groups and curve showing pollen diversity. After Andersen (1995b, fig. 10).*

## Sites

Using results from plough-zone screenings as site signatures, Steinberg (1996, 1997) has clearly demonstrated major differences in flint production between the sites. As a consequence, some sites are easy to locate during surveying, while others are difficult or impossible to find in this way. In spite of these obstacles, the number and dates of the survey sites do augment the above discussion.

During the TAP surveys the term 'site' was used as a rather broad term, not defined by for example a certain number of tools or artefacts per square metre. So whenever the survey crew found a concentration of flakes, stone tools, pottery, fire-cracked stones or dark charcoal-coloured patches on the ploughed field surface, this term was applied. With reference to formal discussions about how to use the term 'site', or whether 'sites' exist at all, we have been able to demonstrate by plough-zone screenings and shovel tests that our survey sites from the Neolithic and the Bronze Age really do exist as more or less clear concentrations of flakes in the plough soil (Steinberg 1996, 1997).

As a consequence of the problems in assigning specific dates to the survey finds, many sites cannot of course be dated precisely, and the TAP surveys have recorded 38 sites with such broad dates that they are useless in this respect. From figures 1.5A and 1.5B it is evident that, with regard to the datable survey sites, almost the same picture emerges as that for the survey finds as a whole. This is of course due to the fact that about 65% of all the survey artefacts were found on sites. The only difference relative to the calculations shown in figure 1.4 is that pottery is also included as dating evidence for the sites.

In order to obtain as clear a picture as possible of the overall situation, all sites with less than two datable objects from at least one of the periods have been omitted. In other words, a site is only dated to a specific period if it has yielded two or more datable objects from that period. By this definition, a single object from another period is regarded as a 'stray find' and does not count. On this basis only two survey sites have been dated to the Funnel Beaker culture, six to the Late Neolithic and eight to the Bronze Age, while 15 have been dated to the Early Iron Age (fig.



BACK TO CONTENT

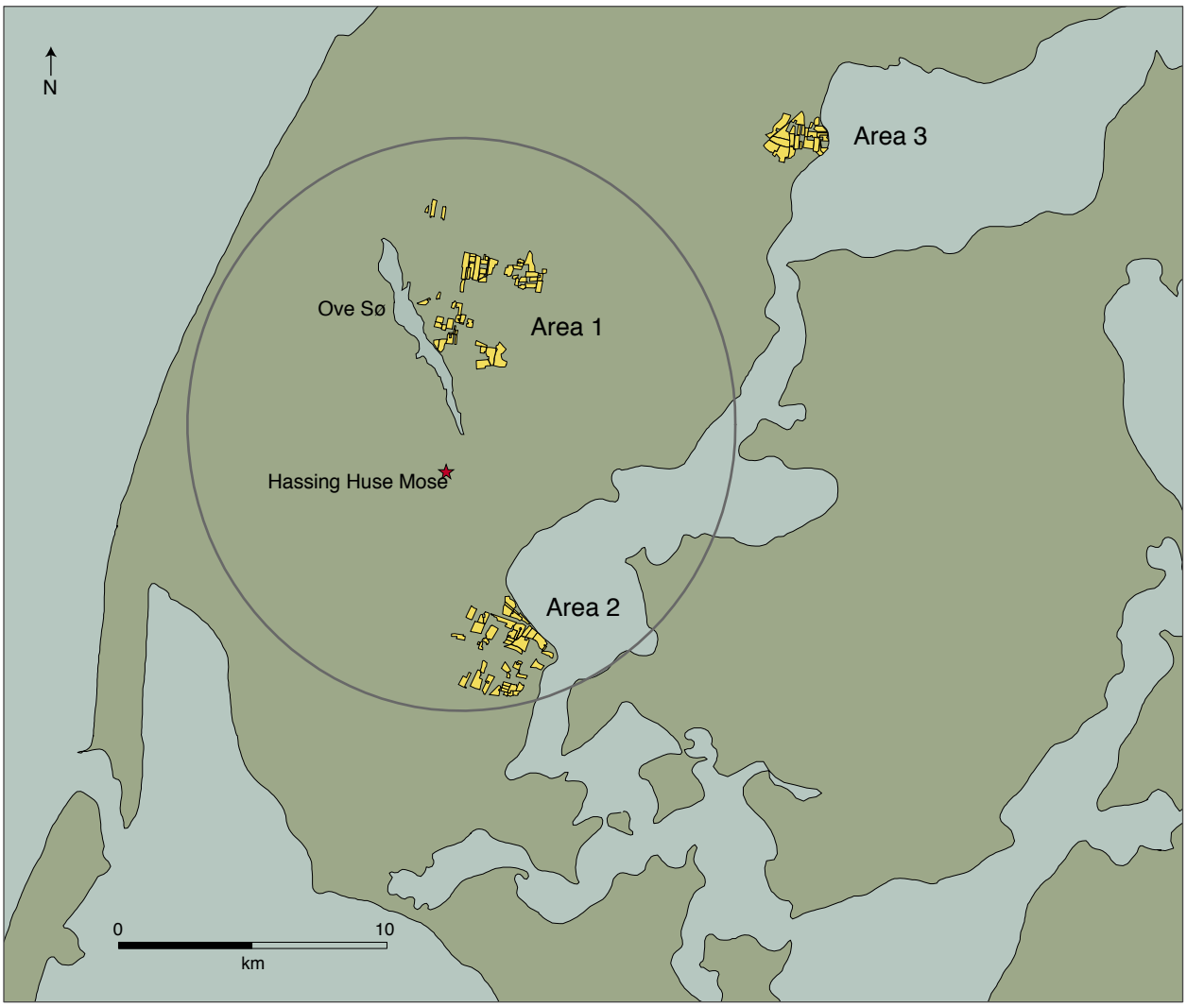



*Figure 1.3. Survey areas for the Thy Archaeological Project (TAP) and the 10 km circle.*

1.5A). The number of datable sites – few as they are – clearly shows the same situation for the Neolithic and the Bronze Age as that revealed by the datable survey finds, i.e. the largest number of sites are those broadly dated to the Late Neolithic/Early Bronze Age. If these sites are divided equally between the two periods, then some of the missing sites from the Early Bronze Age will no doubt be accounted for, but still they only constitute half the number of possible Late Neolithic sites (fig. 1.5B).

In order to expand the database of the survey sites (TAP in fig. 1.5B), it seems reasonable to add datable sites within the 10 km circle that are recorded in the Danish Agency for Culture's Sites and Monuments register (FF in fig. 1.5B). From these data, the increase in settlement activity within the study area is still clearly visible from the Late Neolithic onwards: If the number of sites per year is employed, this tendency becomes even more marked. As for the decrease in the number of sites from the Late Neolithic to the Early Bronze Age evident in figure 1.5B, this question will be addressed in the section below dealing with developments in population density.

On the basis of this evidence, we can conclude that the major increase in the exploitation of the Thy region took place in the Late Neolithic, between 2350 and 1700 BC. Judging from the pollen data, however, this major impact had already begun in the Single Grave culture a couple of hundred years earlier. The problem is that until now it has been impossible to date one single site in the TAP material securely to this period (though THY 3458 in the Sjørring/Tilsted area might be of this date). But as graves from the Single Grave period demonstrate the presence of this cultural group in the area (Glob 1944; Bech & Olsen 1985), the settlement sites are much more difficult to locate by survey than those of earlier and later periods. They are probably small, like



BACK TO CONTENT

| | AYT | AYE | AYS | BÆX | BYX | |
|---|---|---|---|---|---|---|
| Years | 1100 | 450 | 650 | 600 | 600 | TOTAL |
| Artefacts | 33 (16%) | 4 (2%) | 19 (9%) | 9 (4%) | 11 (5%) | 76 |
| AYX | | 47 (22%) | | | | 47 |
| AYE-AYS | | 2 (1%) | | | | 2 |
| AYS-BÆX | | | 83 (39%) | | | 83 |
| BXX | | | | 4 (2%) | | 4 |
| Estimated artefacts | **61.5 (29%)** | | **85 (40%)** | **65,5 (31%)** | | 212 |
| Estimated artefacts per year | **0.040** | | **0.130** | **0.055** | | |

*Figure 1.4. Datable stone artefacts from TAP surveys. AYT: Funnel Beaker culture (3900-2800 BC), AYE: Single Grave culture (2800-2350 BC), AYS: Late Neolithic (2350-1700 BC), BÆX: Early Bronze Age (1700-1100 BC), BYX: Late Bronze Age (1100-500 BC), BXX: Bronze Age (1700-500 BC).*

| | AYT | AYE | AYS | BÆX | BYX | CÆX | |
|---|---|---|---|---|---|---|---|
| Years | 1100 | 450 | 650 | 600 | 600 | 900 | TOTAL |
| Sites | 2 | 0 | 6 | 1 | 7 | 15 | 31 |
| AYX | | 2 | | | | | 2 |
| AYS-BÆX | | | 11 | | | | 11 |
| BXX-CXX | | | | 1 | | | 1 |
| BYX-CXX | | | | | 3 | | 3 |
| Estimated sites | **3** | | **12.5** | **6.5** | **9** | 17 | 48 |

*Figure 1.5A. Datable sites from TAP surveys. AYT: Funnel Beaker culture (3900-2800 BC), AYE: Single Grave culture (2800-2350 BC), AYS: Late Neolithic (2350-1700 BC), BÆX: Early Bronze Age (1700-1100 BC), BYX: Late Bronze Age (1100-500 BC), CÆX: Pre-Roman and Roman Iron Age (500 BC-AD 400), CXX: Iron Age (500 BC-AD 800).*

| **Time** | **AYT** | | **AYE** | | **AYS** | | **BÆX** | | **BYX** | | **CÆX** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TAP | FF | TAP | FF | TAP | FF | TAP | FF | TAP | FF | TAP | FF |
| NUMBER (%) | 3 (3%) | 3 (3%) | 0 | 2 (2%) | 12.5 (11%) | 11 (10%) | 6.5 (6%) | 2 (2%) | 9 (8%) | 8 (7%) | 17 (15%) | 38 (34%) |
| TOTAL | 6 (5%) | | 2 (2%) | | 23.5 (21%) | | 8.5 (8%) | | 17 (15%) | | 55 (49%) | |
| YEARS | 1100 | | 450 | | 650 | | 600 | | 600 | | 900 | |
| SITES PER YEAR | 0.005 | | 0.004 | | 0.036 | | 0.014 | | 0.028 | | 0.061 | |

*Figure 1.5B. Estimated number of datable sites from TAP surveys augmented with other datable sites recorded (status in 2000) in the Danish Agency for Culture's Sites and Monuments register (FF) within the 10 km circle (sites along the North Sea coast included). Abbreviations for time periods – see figure 1.5A.*

| | **Inland (3.216km$^2$)** | **Limfjord coast (5.182km$^2$)** | **Total** |
|---|---|---|---|
| AYT + AYE | 8 (0.0025 pr. km$^2$) | 29 (0.0056 pr. km$^2$) | 37 |
| AYX | 15 (0.0047 pr. km$^2$) | 32 (0.0061 pr. km$^2$) | 47 |
| AYS + BÆX + AYS-BÆX | 67 (0.0208 pr. km$^2$) | 44 (0.0085 pr. km$^2$) | 111 |

*Figure 1.6. Datable stone artefacts from TAP surveys. Distribution inland (fig. 1.3, area 1) and on the Limfjord coast (fig. 1.3, areas 2-3). Abbreviations for time periods – see figure 1.5A.*



BACK TO CONTENT

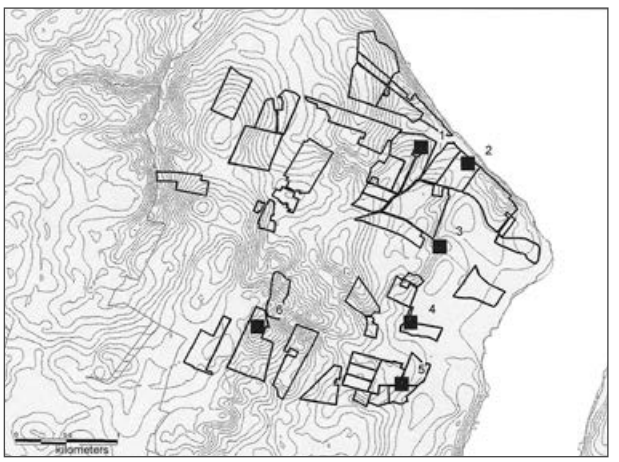



*Figure 1.7A. Datable sites from the Neolithic and the Early Bronze Age in Heltborg parish (fig. 1.3, area 2). Surveyed fields marked. 1-6: Sites.*

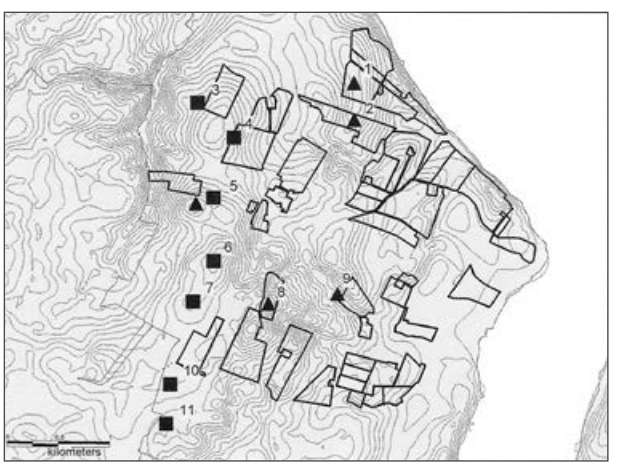



*Figure 1.7B. Datable sites from the Late Bronze Age (triangles) and the Early Iron Age (squares) in Heltborg parish (fig. 1.3, area 2). Surveyed fields marked. 1-11: Sites.*

the Mortens Sande site in the Lodbjerg area (Bech vol. II, chap. 11; Liversage 1988; see also Mathiassen 1948; Hvass 1986; Rostholm 1986). In the Heltborg and Sønderhå/Hørsted areas, a number of flint axes in private collections are important to a discussion of the presence of the Single Grave culture here. Of the 120 axes recorded, two thirds are of the thick-butted type, and of these the majority are typical of the way axes were made in the Single Grave culture. We can therefore say that these axes were very probably used in the first extensive clearances of the woodland in Thy.

In conclusion, it can be stated that the combined archaeological data from Thy confirm the picture obtained from the pollen data with respect to the Neolithic.

## Developments in population density

When dealing with the numbers of sites, the fact that the sizes of the sites from the different periods are clearly not the same must be taken into account. In our count, large Iron Age sites that could accommodate a large number of people have the same weight as small sites from for example the Funnel Beaker culture. However, there is no doubt that the increasing number of sites from the Neolithic to the Iron Age indicates a rise in the population density, but still we have no evidence that permits us to go into detail. The hypothesis that there was stabilisation of, or perhaps even a decline in, the population size from the Late Neolithic to the Early Bronze Age in Thy, as suggested by Timothy Earle (Earle 1997; see also Earle *et al.* 2010), may find some support in the survey data. However, it seems much more likely that we are dealing with a question of the different visibility of sites of the Late Neolithic and those of the Early Bronze Age. It is evident that Bronze Age sites can be difficult to detect during surveys (Mikkelsen 1991). A decline in the number of diagnostic tools from the Stone Age to the Bronze Age could also have an influence. Furthermore, it seems rather unlikely that a decline in population density took place, taking into consideration the number of burials from the two periods: The Early Bronze Age burials vastly outnumber those from the previous centuries. The results of the investigations carried out by Museum Thy and Martin Mikkelsen in the Aas area (fig. 1.1), facing out towards the Limfjord just south of the survey area in Tilsted/Sjørring parishes, also clearly demonstrate that, with regard to this micro-region, the Bronze Age sites and houses excavated here do not demonstrate any decrease whatever in the level of activity and the size of the population between the Late Neolithic and the Early Bronze Age. As the Bronze Age impact is much more clearly evident than that of the Late Neolithic, the opposite is more likely to be true (Mikkelsen 2003, vol. II, chap. 28). This conclusion is further supported by subsequent excavations across the whole of Thy (Bech & Rasmussen vol. I, chap. 2; Bech vol. II, chap. 11).

## Site distribution

Given the restricted number of dated sites, diachronic changes in the settlement pattern can only be tentatively demonstrated and in very broad outline. The main difference between the three surveyed areas is to be found in the Neolithic period, as the Funnel Beaker culture preferred the Limfjord coast to the



BACK TO CONTENT

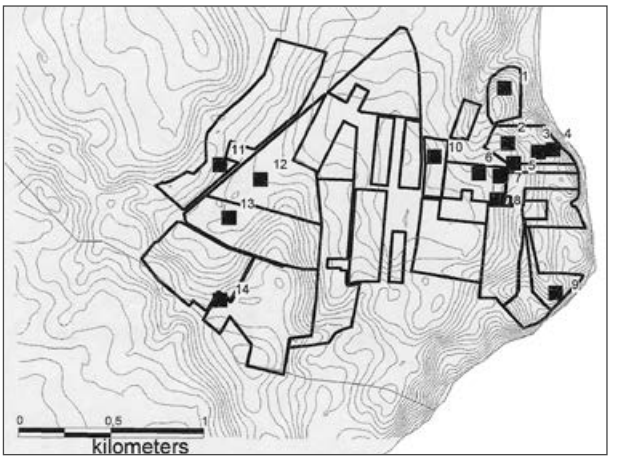



*Figure 1.8A. Datable sites from the Neolithic and the Early Bronze Age in Tilsted and Sjørring parishes (fig. 1.3, area 3). Surveyed fields marked. 1-14: Sites.*

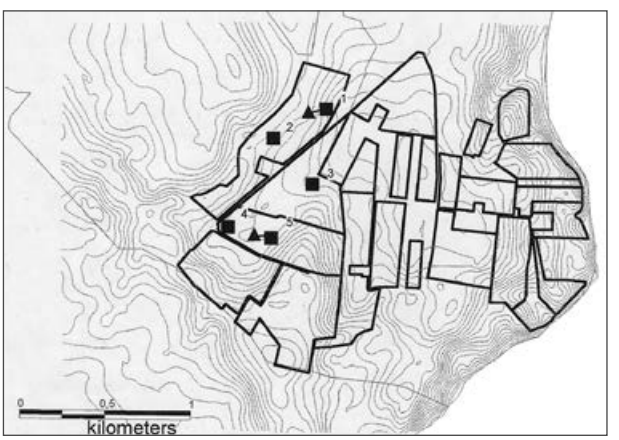



*Figure 1.8B. Datable sites from the Late Bronze Age (triangles) and the Early Iron Age (squares) in Tilsted and Sjørring parishes (fig. 1.3, area 3). Surveyed fields marked. 1-5: Sites.*

inland region of Sønderhå,[3] while the Late Neolithic (and Early Bronze Age) impact is much more clearly seen at Sønderhå (fig. 1.6). This change no doubt mirrors the major opening up of the inland areas and the development from woodland to grassland that was reflected in the pollen samples. Regarding the Late Bronze Age and Early Iron Age, the situation seems to be more or less the same in the three areas. Meanwhile, an interesting pattern can be observed along the Limfjord coast. Both at Heltborg (fig. 1.7A-B)[4] and in the Silstrup area to the north (fig. 1.8A-B),[5] sites from the Neolithic and the Early Bronze Age are much closer to the coast than those of the Late Bronze Age and Early Iron Age. As the soils are the same, both near the coast and further inland, the reason for this difference cannot be explained solely in terms of a decrease in the importance of the resources from the fjord, but has perhaps also some strategic implication. Evidence of raiding by boat in southern Jutland during the Pre-Roman Iron Age is provided by the Hjortspring boat – a warrior vessel (Rosenberg 1937). So if any external forces threatened the village communities of the Early Iron Age in Thy, they no doubt came from the fjord. The observed change in the preferred position of the sites can therefore tentatively be explained as the introduction of a kind of buffer zone to the coast, for security or other reasons. In a study of the prehistoric settlement of eastern Jutland, B. Ejstrud is able to demonstrate a similar shift away from watercourses – even small ones with no obvious security importance – in the Late Bronze Age and Early Iron Age (B. Ejstrud personal communication). This indicates that other, more general patterns of site relocation could also be a reason for the observed change in the Limfjord region.

The need for transport of goods and better communication between sites could similarly have played a role in the location of Early Iron Age sites, favouring the higher lying areas away from the fjord. Perhaps it is no coincidence that the main road along the Limfjord in the Heltborg region is situated in the same area as the north-south row of Iron Age sites shown on figure 1.7B.

## Early Bronze Age sites at Sønderhå

While the Late Neolithic presence in the inland region of Thy is very clear, it is, on the other hand, impossible to see what happened in the Early Bronze Age using the TAP survey data alone. As demonstrated above, one of the disadvantages of the survey method is that it does not produce many clearly datable objects. To overcome this problem, recording of private collections was undertaken, as has been done by many others previously in studies of settlement patterns (Mathiassen 1948; Vedsted 1986), and in doing so we more than doubled the number of datable finds. However, what was gained in the number of finds was to some degree lost in precision, as the actual find spot could sometimes not be remembered exactly by the collectors. Nevertheless, looking through three private collections in Sønderhå, comprising a total of 359 artefacts, we actually found evidence showing that the distribution of Late Neolithic daggers (or fragments of daggers) in the northeastern part of Sønderhå clearly overlaps with the distribution of a special type of Early Bronze Age bifacially worked flint sickle, the asymmetrical sickle (fig. 1.9) (Bech



BACK TO CONTENT

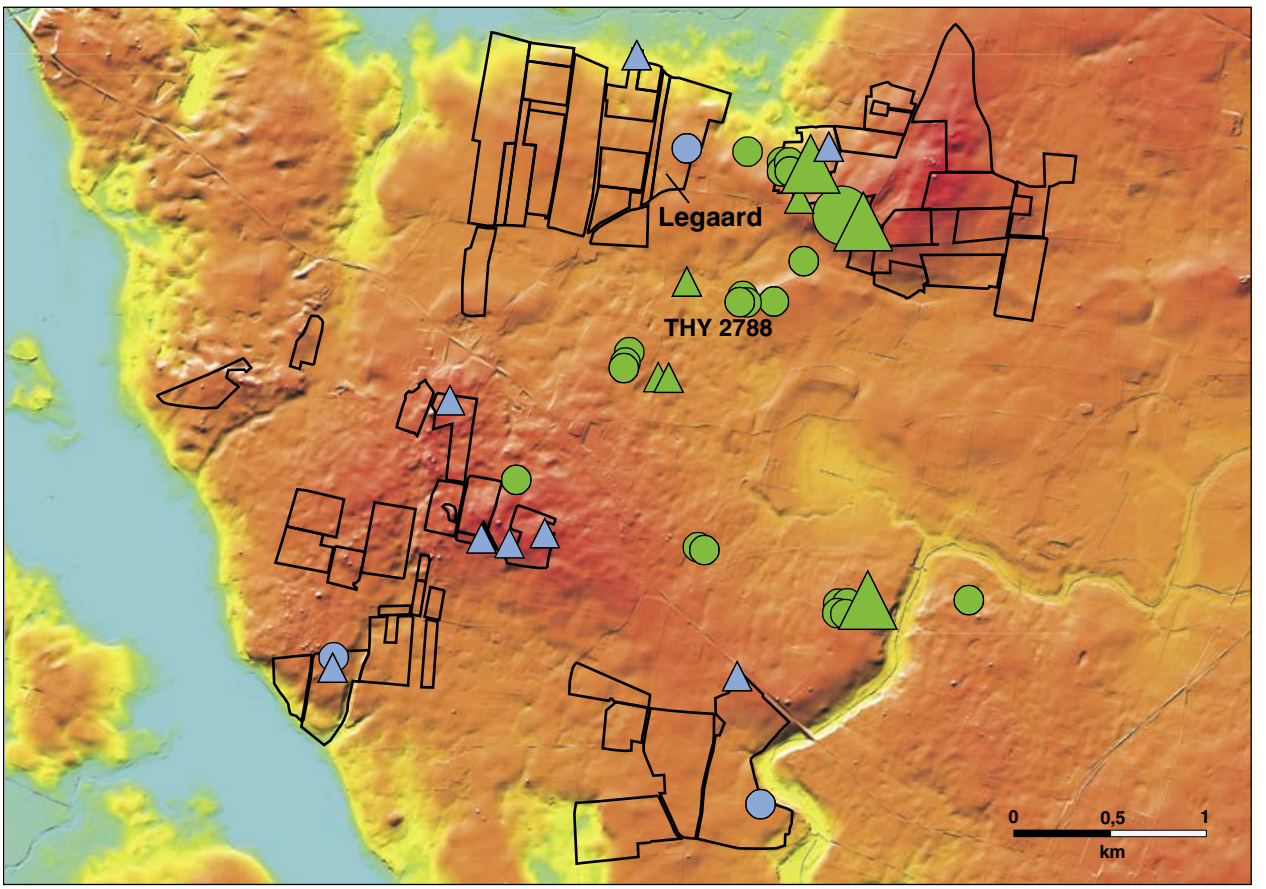



*Figure 1.9. LIDAR scan showing the distribution of Late Neolithic daggers (triangles) and Early Bronze Age asymmetrical sickles (circles) found during TAP surveys (blue) or by private collectors (green) in Sønderhå. Large symbols: 5 or more than five examples. Copyright: The Danish Geodata Agency.*

1997, vol. I, chap. 2; Eriksen vol. II, chap. 21). The conclusion was easy to reach: The Bronze Age sites are not absent, but are found within the same general topography as those of the Late Neolithic (see also Kristiansen 1998). Based on the survey data, it can be added that with only one field-walking exercise, the Late Neolithic sites are perhaps easier to locate than those of the Early Bronze Age. This could very well be due to increasing specialisation from the Late Neolithic to the Bronze Age, with sites from the latter period appearing to have had a more varied degree of flint production than those of the previous period (Steinberg 1996, 1997). The Legaard site at Sønderhå illustrates this point. Despite its size and the number of houses represented, this site did not have much worked flint on the surface (Earle *et al.* 1998; Mikkelsen & Kristiansen vol. II, chap. 29). On the other hand, a nearby Bronze Age site (THY 2788) was very easy to track both in shovel and plough-zone tests (Steinberg 1996, 1997). This site also yielded a number of Early Bronze Age flint sickles that came to light in a private collection (fig. 1.9) but, in contrast to Legaard, only a few structures from one phase of a single farmstead were revealed by excavation (Earle *et al.* 1998; Earle vol. II, contribution in chap. 29).

When the results of the TAP surveys were published more than 10 years ago (Bech 2003), it was evident that sites from the Bronze Age were under-represented to some extent. They clearly did not match the large number of burials from this period and the magnitude of the human impact deduced from the pollen studies. Not until the results of systematic trial excavations and full-scale excavations of Bronze Age houses, conducted by TAP and as normal rescue excavations by the Museum Thy, were combined with a large number of radiocarbon dates, did we realise how well the settlement data in Thy in fact match the results of the pollen analyses. Given this realisation, the survey data are actually overruled by other evidence and we can conclude that, although a large increase in the level of exploitation of Thy took place in the Late Neolithic, this was continued with a consequent even greater impact during the Early and Middle Bronze Age. The Bronze Age part of this story will be told in the subsequent chapters of this book.



BACK TO CONTENT

# Notes

1. Parts of this chapter were originally included in an article published by the author in 2003 in H. Thrane (ed.), *Diachronic Settlement Studies in the Metal Ages. Report on the ESF workshop Moesgård, Denmark, 14-18 October 2000*, pp. 13-44. To correspond with the absolute chronology in the present volume, minor changes have been made in the dates used in figure 1.4-5B for the beginning of the Late Neolithic and the Late Bronze Age, respectively.

2. In 1991-1993, TAP surveys were led by N. Thorpe, University College London (now King Alfred's College, Winchester) and in 1994-1997 by J. Westphal, University of Aarhus, Institute of Prehistoric Archaeology, Denmark (now Danish Agency for Culture).

3. Although the western coastline of Thy in the Atlantic and early Sub-Boreal periods was about 5 km inland compared to that of the present day (Jessen 1920), the inland character of the Sønderhå area during the Neolithic and Early Bronze Age is based on the fact that already in the middle of the Atlantic period coastal barriers blocked the connection between the lake Ove Sø and the North Sea (Andersen 1994).

4. Sites on figure 1.7A: 1: Ny Nørregård I, THY 2983 (site no. 110605-142); 2: Bjerregård I, THY 2981 (site no. 110605-141); 3: Heltborg (site nos. 11605-17-18); 4: Toftum II, THY 2978 (site no. 110605-140); 5: Toftum, THY 3425 (site no. 110605-114); 6: Skårhøj, THY 2965 (site no. 110605-26).
   Sites on figure 1.7B: 1: Ullerup II, THY 2982 (site no. 110605-143); 2: Gøggård I, THY 2985 (site no. 110605-144); 3: Ullerup (site nos. 11605-2-3); 4: Ullerup, THY 3460 (site no. 110605-117); 5: Heltborg, THY 1690 (site no. 11605-105); 6: Heltborg (site no. 11605-101); 7: Søndergård, THY 2001 (site no. 11605-107); 8: Heltborg SØ, THY 3855 (site no. 11605-118); 9: Østerdal, THY 2918 (site no. 11605-111); 10: Ginnerup, THY 2004 (site no. 11605-37); 11: Ginnerup Vestergård + Slyngborg (site nos. 11605-88 + 93).

5. Sites on figure 1.8A: 1: Akkedal I, THY 3493 (site no. 110310-84); 2: Silstrup Nord VIII, THY 3500 (site no. 110310-85); 3: Silstrup Nord IX, THY 3701 (site no. 110310-86); 4: Silstrup Nord X, THY 3702 (site no. 110310-87); 5: Silstrup Nord VII, THY 3495 (site no. 110310-88); 6: Silstrup Nord II, THY 3488 (site no. 110310-89); 7: Silstrup Nord III, THY 3489 (site no. 110310-90); 8: Silstrup Nord IV, THY 3490 (site no. 110310-91); 9: Silstrup Hoved VIII, THY 3499 (site no. 110310-93); 10: Silstrup Nord V, THY 3491 (site no. 110310-92); 11: Nr. Nordentoft III, THY 3451 (site no. 110305-266); 12: Sdr. Nordentoft II, THY 3453 (site no. 110305-268); 13: Sdr. Nordentoft IV, THY 3455 (site no. 110305-270); 14: Sdr. Nordentoft VII, THY 3458 (site no. 110305-272); 15: Nr. Nordentoft, THY 2456 (site no. 110305-263).
   Sites on figure 1.8B: 1: Nr. Nordentoft, THY 2456 (site no. 110305- 263); 2: Nr. Nordentoft II, THY 3450 (site no. 110305- 265); 3: Sdr. Nordentoft, THY 3452 (site no. 110305- 267); 4: Sdr. Nordentoft III, THY 3454 (site no. 110305- 269); 5: Sdr. Nordentoft V, THY 3456 (site no. 110305-270).

# References


Andersen, S.T. 1994. Pollenanalyser fra Ove Sø. Geobotaniske Undersøgelser Af Kulturlandskabets Historie. *DGU Kunderapport* no. 18, pp. 30-33.

Andersen, S.T. 1995a. History of Vegetation and Agriculture at Hassing Huse Mose, Thy, Northwest Denmark, since the Ice Age. *Journal of Danish Archaeology* 11 (1992-93), pp. 57-79.

Andersen, S.T. 1995b. Pollenanalyser fra Ove Sø. Geobotaniske Undersøgelser Af Kulturlandskabets Historie. *DGU Kunderapport* no. 12, pp. 36-55.

Andersen, S.T. 1999. Pollen analyses from Early Bronze Age Barrows in Thy. *Journal of Danish Archaeology* 13 (1996-97), pp. 7-17.

Andersen, S.T., B. Aaby, B.V. Odgaard 1983. Environment and Man. Current Studies in Vegetational History at the Geological Survey of Denmark. *Journal of Danish Archaeology* 2, pp. 184-196.

Bech, J.-H. 1997. Bronze Age Settlements on raised sea-beds at Bjerre, Thy, NW-Jutland. In: J.J. Assendorp (ed.), *Forschungen zur bronzezeitlichen Besiedlung Mittel- und Nordeuropas. Internationales Symposium vom 9.-11. Mai 1996 in Hitzacker*, pp. 3-15. Internationale Archäologie 38. Espelkamp: Marie Leidorf.

Bech, J.-H. 1998. Thy Projektet. In: M.B. Henriksen (ed.), *Bebyggelseshistoriske projekter. Deres betydning, bearbejdning og publikation. Rapport fra et bebyggelseshistorisk seminar på Hollufgård den 9. april 1997*, pp. 57-65. Skrifter fra Odense Bys Museer 3. Odense: Odense Bys Museer.




BACK TO CONTENT

Bech, J.-H. 2003. The Thy Archaeological Project – Results and Reflections from a Multinational Archaeological Project. In: H. Thrane (ed.), *Diachronic Settlement Studies in the Metal Ages. Report on the ESF workshop Moesgård, Denmark, 14-18 October 2000*, pp. 13-44. Jutland Archaeological Society publications 45. Højbjerg: Jutland Archaeological Society.

Bech, J.-H. & A.-L. Haack Olsen 1985. Nye gravfund fra enkeltgravskulturen i Thy. *Museer i Viborg Amt* 13, pp. 36-47.

Bech, J.-H. & M. Mikkelsen 1999. Landscapes, settlement and subsistence in Bronze Age Thy, NW Denmark. In: C. Fabech & J. Ringtved (eds.), *Settlement and Landscape. Proceedings of a conference in Århus, Denmark, May 4-7 1998*, pp. 69-77. Højbjerg: Jutland Archaeological Society.

Bertelsen, J.B., M. Christensen, M. Mikkelsen, P. Mikkelsen, J. Nielsen & J. Simonsen 1996. *Bronzealderens bopladser i Midt- og Nordvestjylland*. Skive: Skive Museum.

Earle, T. 1997. *How chiefs come to power. The political Economy in Prehistory*. Stanford: Stanford University Press.

Earle, T., J.-H. Bech, K. Kristiansen, P. Aperlo, K. Kelertas & J. Steinberg 1998. The political Economy of Late Neolithic and Early Bronze Age Society: The Thy Archaeological Project. *Norwegian Archaeological Review* 31/1, pp. 1-28.

Earle, T. & K. Kristiansen (eds.) 2010, *Organizing Bronze Age Societies. The Mediterranean, Central Europe & Scandinavia Compared*. Cambridge: Cambridge University Press.

Earle, T., M.J. Kolb, M. Artursson, J.-H. Bech, M. Mikkelsen & M. Vicze 2010. Regional Settlement Patterns. In: T. Earle & K. Kristiansen (eds.), *Organizing Bronze Age Societies. The Mediterranean, Central Europe & Scandinavia Compared*, pp. 57-87. Cambridge: Cambridge University Press.

Glob, P. V. 1944. Studier over den Jyske Enkeltgravskultur. *Årbøger for nordisk Oldkyndighed og Historie*, pp. 1-283.

Hvass, St. 1986. En boplads fra enkeltgravskulturen i Vorbasse. In: C. Adamsen & K. Ebbesen (eds.), *Stridsøksetid I Sydskandinavien. Beretning fra et symposium 28.-30. Oct. 1985 i Vejle*, pp. 325-335. Arkæologiske Skrifter 1. København: Forhistorisk Arkæologisk Institut.

Jessen, A. 1920. *Stenalderhavets Udbredelse i det nordlige Jylland*. DGU II series no. 35. København: C.A. Reitzel.

Kelertas, K. 1997. *The Changing political economy of Thy, Denmark. The paleobotanical Evidence*. University of California, unpublished PhD thesis.

Kristiansen, K. 1998. The Construction of a Bronze Age Landscape. Cosmology, Economy and Social Organisation in Thy, Northwestern Jutland. In: B. Hänsel (ed.), *Man and Environment in European Bronze Age*, pp. 281-292. Kiel: Oetker-Voges.

Kristiansen, K. 1999. Symbolic structures and social institutions. The twin rulers in bronze age Europe. In: A. Gustafsson, & H. Karlsson (eds.), *Glyfer och arkeologiska rum – en vänbok till Jarl Nordbladh*, pp. 537-552. GOTARC Series A, vol. 3. Göteborg: Göteborg University.

Liversage, D. 1988. Mortens Sande 2 – a Single Grave Camp site in Northwest Jutland. *Journal of Danish Archaeology* 6 (1987), pp. 101-124.

Mathiassen, T. 1948. *Studier over Vestjyllands Oldtidsbebyggelse*. Nationalmuseets Skrifter, Arkæologisk-Historisk Række II. København: Gyldendal.

Mikkelsen, M. 1991. Metode og prioritering i forbindelse med lokalisering og udgravning af bronzealderbosættelser. *Arkæologiske udgravninger i Danmark*, pp. 33-42.

Mikkelsen, M. 2003. *Bebyggelsen i bronzealder og tidlig ældre jernalder i Østthy*. University of Århus, unpublished PhD thesis.

Odgaard, B.V. & P. Rasmussen 2000. Origin and temporal development of macro-scale vegetation patterns in the cultural landscape of Denmark. *Journal of Ecology* 88, pp. 733-748.

Pedersen, A.S. & K.S. Petersen (ed.) 1989. *Jordartskort over Danmark,* 1:200.000, Nordjylland. Danmarks Geologiske Undersøgelse. København: Miljøministeriet.

Rosenberg, G. 1937. *Hjortspringfundet*. Nordiske Fortidsminder 3/1. København: Det kgl. nordiske Oldskriftselskab.



BACK TO CONTENT

Rostholm, H. 1986. Lustrup og andre bopladsfund fra Herning-egnen. In: C. Adamsen & K. Ebbesen (eds.), *Stridsøksetid I Sydskandinavien. Beretning fra et symposium 28.-30. Oct. 1985 i Vejle*, pp. 301-317 Arkæologiske Skrifter 1. København: Forhistorisk Arkæologisk Institut.

Steinberg, J. 1996. Ploughzone sampling in Denmark. Isolating and interpreting site signatures from disturbed contexts. *Antiquity* 70, pp. 368-392.

Steinberg, J. 1997. *The Economic Prehistory of Thy, Denmark: A study of the Changing Value of Flint Based on a Methodology of the Plowzone*. University of California, unpublished PhD thesis.

Thorpe, N. 1997. From Settlements to Monuments: Site Succession in Late Neolithic and Early Bronze Age Jutland, west Denmark. In: G. Nash (ed.), *Semiotics of Landscape: Archaeology of Mind*, pp. 71-79. BAR International Series 661. Oxford: Archaeopress.

Vedsted, J. 1986. *Fortidsminder og kulturlandskab. En kildekritisk analyse af tragtbægerkulturens fundmateriale fra Norddjursland*. Ebeltoft: Djurslands Museum and Forlaget Skippershoved.



BACK TO CONTENT

BACK TO CONTENT

Chapter 2

# Thy and the outside world in the Bronze Age

## Regional variations in a North Sea perspective

*Jens-Henrik Bech & Marianne Rasmussen*[1]
*with a contribution by Jesper Olsen & Marie Kanstrup*

## The setting

### Introduction

The large number of Bronze Age houses found during rescue excavations in Jutland over the last 40 years provides a good example of how new legislation and new excavation techniques have led to expansion of the archaeological record on a scale that would have been almost inconceivable a few decades ago (Jensen 1988; Rasmussen & Adamsen 1993). As in many other parts of Denmark and neighbouring areas of southern Scandinavia, these developments also took place in Thy, and the results presented in this book, in addition to being the outcome of the Thy Archaeological Project, are also a consequence of this major change in archaeological fieldwork.

Due to its location in the northwestern part of the Jutland peninsula, bordering the North Sea, Thy's contacts with other regions along the North Sea coast were of great importance in both prehistoric and historical times. In this introductory chapter we will therefore examine some of the themes of subsequent chapters in a North Sea perspective and draw comparisons between Thy and selected regions along the North Sea coast.[2]

One major theme is the development of the Bronze Age farmhouse in Thy, in southern Jutland and in Rogaland, Norway, and the large numbers of well-dated settlement sites now available provide a new foundation for analysis and comparison. A second theme, the introduction of byres in the Bronze Age around 1500 BC, is then examined using present evidence from Jutland. This is followed by a section on the contemporary economy that explores common traits in land-use and the subsistence strategy in various regions along the North Sea coast. There is then a section on regional interaction that also explores the introduction of cremation and other related phenomena. In conclusion, we speculate on the nature of the travels and trade that linked North Sea regions together during most of the Bronze Age.

This chapter begins, however, with Jutland's landscape and the results of various pollen studies that, with some regional variation, show increasingly intensive exploitation from the Late Neolithic up through the Bronze Age.

### The landscape and its exploitation

The geological map of Jutland reflects the complex history of the landscape (fig. 2.1). The main stationary line of the Weichselian glacial ice sheet runs north-south and marks the primary division between east and west in the central part of Jutland. To the east and north is a gently undulating landscape of clay-rich moraine deposits. To the west, sandy diluvial plains of lateglacial date surround older moraine hill formations from the Saale glaciation. Several small rivers flow east-west, running from the terminal moraine through the diluvial plains and into the North Sea. To the north, the Limfjord cuts across from east to west through a landscape once covered by the Weichselian ice sheet. In northern Jutland, areas of former seabed from lateglacial and postglacial transgressions add to the diversity of the landscape and now occur above sea level due to postglacial uplift. It is here that Thy, together with the large island of Mors and the neighbouring peninsula of Salling to the east, constitutes a fertile island. This is bordered by the sandier landscape of western Jutland to the south and by less fertile and more complex landscapes to the north. As a consequence, Thy, Mors and Salling have a greater productive potential than any other region in western and northwestern Jutland.

In the previous chapter, we explained how pollen analysis was integrated into the Thy Archaeological Project in order to reveal the vegetation history of the region and human exploitation of the landscape through prehistory. Two regional pollen diagrams were produced, based on cores obtained from Hassing Huse Mose and Ove Sø (Andersen 1995a-b). One of the most important findings was the detection of a



BACK TO CONTENT

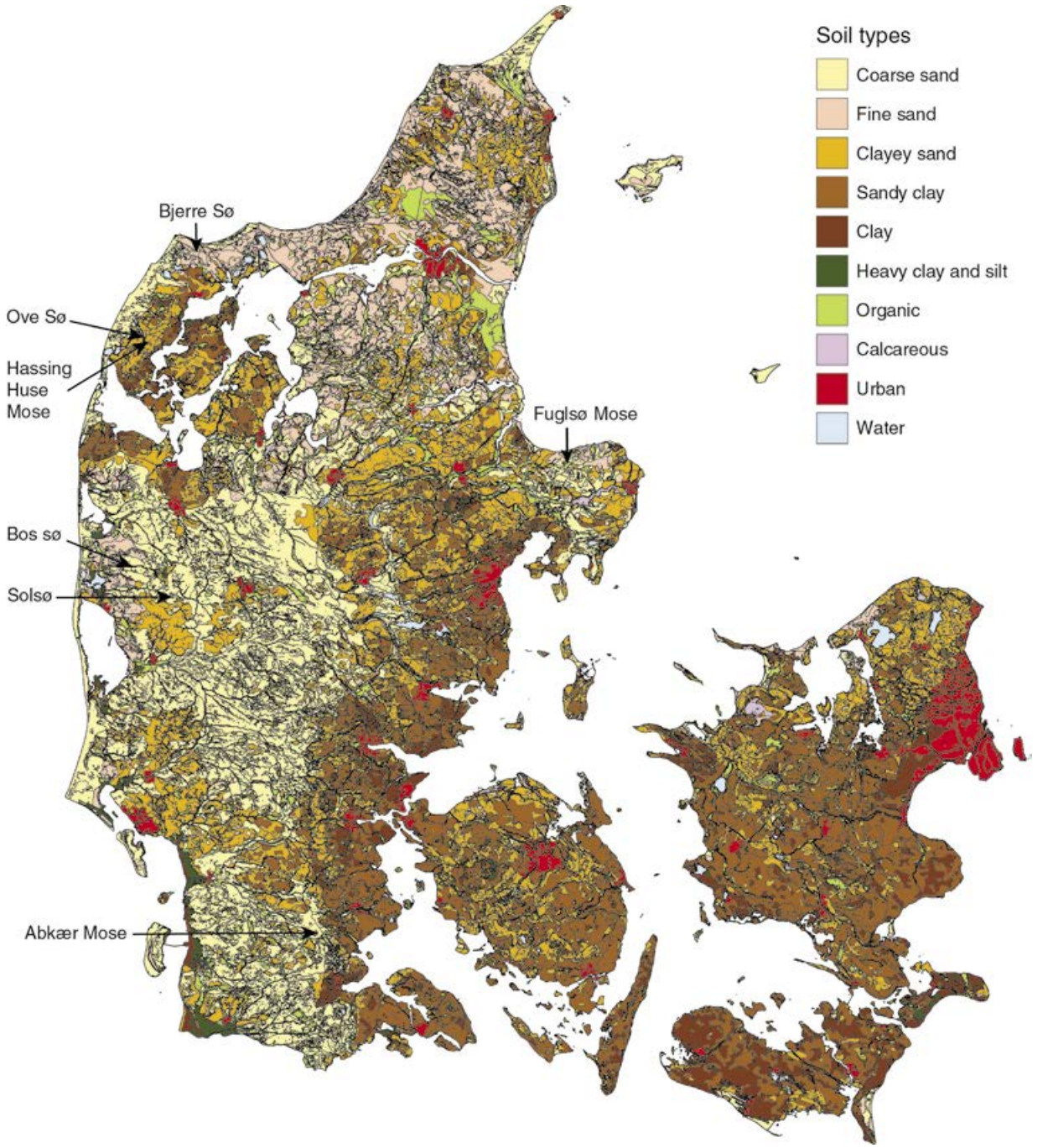



*Figure 2.1. Geological map of Denmark showing the main features of the Quaternary landscape. Geological Survey of Denmark and Greenland. The locations of regional pollen diagrams mentioned in the text are marked.*

major and very distinct *landnam* phase during the early 3rd millennium BC. This has been described as one of the most extensive prehistoric forest clearances seen in northern Europe (Kristiansen 1998a), and it resulted in the first real opening up of the landscape during the Single Grave culture and the Late Neolithic in Thy. Subsequently, treeless areas expanded during the Early Bronze Age, followed by some regeneration of secondary woodland in the Late Bronze Age (Andersen 1995a-b; Søgaard *et al.* vol. I, chap. 8). The pollen data set the ecological scene for Bronze Age Thy – an open cultural landscape with no continuous woodland in which trees were mainly restricted to wetland areas. As a consequence, fuel resources and building materials were already scarce in the Bronze Age (Holst *et al.* 2013). From period III onwards, there is evidence for peat cutting (Olsen *et al.* 1996; Henriksen *et al.* vol. II, chap. 25) and even the



BACK TO CONTENT

use of dung for fuel has been demonstrated at Late Bronze Age Bjerre (Henriksen *et al.* vol. II, chap. 25). No wonder the wood found preserved at Bjerre clearly reflects the difficulty in obtaining proper building materials: even driftwood and ancient timber recovered from peat bogs was put to use (Malmros vol. I, chap. 10). A similar resource scenario is seen at the same time in the Hebrides (Taylor 1999; Branigan *et al.* 2002; Walker & McGregor 1996, 21) and Orkney (Alldritt 2007, 14).

Interestingly, a somewhat similar development also occurred in the coastal areas of Rogaland, southwest Norway (Prøsch-Danielsen & Simonsen 2000). Following some deforestation at the Mesolithic/Early Neolithic transition, extensive changes to the vegetation took place around 2500 BC, at the end of late MN II and the beginning of LN I, when the landscape was opened up for pastoral agriculture. There was then considerable impact on the remaining forest vegetation in 1900-1400 BC, resulting in an open landscape, as in Thy, with virtually no woodland remaining. After a while, complete deforestation was followed by the formation of permanent heath across much of Rogaland's coastal area. This transformation was complete before the end of Late Bronze Age period V (Prøsch-Danielsen & Simonsen 2000, 35f; Høgestøl & Prøsch-Danielsen 2006; see further below).

As in Thy, the opening up of the landscape in western Jutland took place during the Single Grave culture and with almost the same dramatic effects (Odgaard 1994, 2006, 346 ff). Due to the lower clay content of the soil, heath vegetation is more prominent in the regional pollen diagrams from this area than in those from Thy. The importance of the heather (*Calluna*) heath in western Jutland is shown by evidence of regular burning in order to maintain the heathland vegetation. As in Thy, the areas around Solsø and another lake in the northern part of western Jutland, Bos Sø (fig. 2.1) were subject to increased human impact during the Early Bronze Age (Odgaard 2000, 30ff).

Other areas of Jutland supported denser woodland and the formation of a fully open landscape was delayed here. A pollen diagram from a raised bog, Fuglsø Mose, in the northern part of Djursland, only about 10 km west of Hemmed and Glesborg where there are numerous Late Neolithic and Bronze Age settlements (Boas 1991, 1993), reveals a radically different landscape with more woodland than in Thy and western Jutland (Aaby 1985). Not until the beginning of the Late Neolithic, around 2350 BC, i.e. contemporary with developments in southwest Norway, is a marked rise seen in grass and plantain, indicating increasing human activity. This impact extended into the Early Bronze Age, when a decline in lime pollen indicates decimation of the high forest (Aaby 1985, 71f; Robinson 2003, 161). At the beginning of the Late Bronze Age, a major change occurs in the pollen diagram, revealing the arrival of beech on Djursland, and the woodland acquired a character that was maintained for over a millennium. The first heath areas could also have been created at this time, when grassland also expanded somewhat (Aaby 1985, 74; Robinson 2003, 161).

Similarities in developments during the Late Neolithic and the Bronze Age link Djursland with northern Jutland even if these changes did not result in complete deforestation. However, a regional pollen diagram from Abkær Mose, about 10 km southwest of Haderslev in southern Jutland, reveals further differences from Thy and western Jutland. Abkær Mose is situated on the border between the fertile undulating moraine landscape of the eastern part of southern Jutland and the less fertile diluvial plain towards the west. First of all, the impact of the Single Grave culture and the Late Neolithic was not as prominent here as further north, but an opening up of the landscape around 2600 BC, with a concurrent increase in the amount of grassland, can be observed. Although woodland still dominated, it now became interspersed with grassland and arable fields (Aaby 1986, 1990; Meier 2000; Robinson 2003, 159).

In a Bronze Age context, the most striking feature of the regional pollen diagram from Abkær Mose relates to an early part of the period. The distance from Abkær Mose to one of the area's rich Early Bronze Age sites with large timber-built houses, Brødrene Gram at Vojens (see below), is only about 7 km. Furthermore, there are numerous Early Bronze Age barrows within a 10 km radius, which would normally indicate the existence of open areas (see for example the distribution of burial sites in Johansen *et al.* (2004) and Poulsen (1993, fig. 1)). A regional pollen diagram like that from Abkær Mose normally reflects the vegetation within a 5-10 km radius of the sampling site (Aaby 1993, 24). Nevertheless, Early Bronze Age barrow building and the construction of large wooden houses do not appear to have had a major impact in the pollen record from Abkær Mose. The only important change evident during the Early Bronze Age is a decline in the amount of hazel pollen (Aaby 1986, 282, fig. 3). This was quite a different landscape to that documented in Thy and, with its forest character, it was more closely related to what we see in eastern Denmark (Odgaard 2006, 346ff) and further to the south and southeast in pollen diagrams from Schleswig-Holstein (Dörfler *et al.* 2012) and Brandenburg (Jahns & Kirleis 2013). However, it should be noted that the copious pollen production of forest trees creates a distorted picture, even when traditional correction factors are applied. This is confirmed by recent research involving 'absolute' pollen diagrams (Hellman *et al.* 2009). The implica-



BACK TO CONTENT

tion is that open land was probably more widespread in the vicinity of Abkær Mose than suggested by the pollen data.

However, beginning around 1000 BC, the situation became 'normalised' at Abkær, falling into line with the evidence of other pollen diagrams from Jutland. The effects of human impact are clearly evident, as this resulted in the creation of open areas with commons and grassland, interspersed with smaller and larger and areas of woodland. Interestingly, the increased human impact evident in the Late Bronze Age and in the Early Iron Age around Abkær Mose is also reflected in elevated amounts of mineral dust in the peat that originated from exposed soils that lay bare following ploughing or during cultivation (Aaby 1990, 137ff). For some unknown reason, however, this development is not reflected in the archaeological record of the Late Bronze Age (see further below).

Through the above-mentioned regional pollen studies, it has become clear that, despite the difference in the extent of the human impact in the various landscapes, there are also many common features. The most prominent of these is the common development across northwest Jutland, beginning as early as the Single Grave culture and continuing through the Late Neolithic and Early Bronze Age. During the latter periods, there were also parallel developments in Rogaland and, in part, on Djursland.

Woodland was forced back everywhere to make way for grazed common or heath and thereby facilitate larger numbers of livestock. Arable agriculture, on the other hand, is less visible in the pollen diagrams. However, as shown by the elevated dust deposition over Abkær Mose, crop cultivation appears to have become of greater significance in the Late Bronze Age than in previous periods.

After this brief account of the most important features of landscape development during the second half of the Neolithic and the Bronze Age, we now return to one of the main themes of this chapter: Habitation as reflected in the numerous burial sites and the many newly discovered settlements.

## Bronze Age settlement in Jutland: Burials and houses

A breakthrough occurred in Danish archaeological fieldwork back in the 1960s when C.J. Becker, in his large excavations in western Jutland, introduced machinery for the removal of topsoil from large excavation areas (Becker 1972, 6). This immediately resulted in the discovery of an almost overwhelming number of Pre-Roman Iron Age houses at Grøntoft. These were soon followed by Bronze Age houses, not only at Grøntoft but also at several other sites (Becker 1968, 1972). In a review of Bronze Age settlements in Denmark published in 1985, H. Thrane concludes that the findings from Becker's campaigns in western Jutland have shown that the distribution of Bronze Age burial sites is not a reliable indication of the distribution of Bronze Age settlements (Thrane 1985, 144, 1999, 129). C.J. Becker made this observation himself as early as 1975 (1976, 74) and repeated it in 1980 (1980, 129) as a sceptical comment on K. Kristiansen's first article about Bronze Age settlement and land-use (Kristiansen 1978). In short, there appeared to be too many Bronze Age houses in western Jutland compared to the number of contemporaneous burial sites recorded from the same area.

There are of course many well-known caveats and pitfalls to be taken into consideration when dealing with matters of representativity. As mentioned above, Jutland comprises a great variety of landscape types and the different geological conditions have influenced the ways in which the landscape was used, thereby creating varying conditions for the preservation of prehistoric monuments. Combined with uneven levels of antiquarian activity, this has resulted in an archaeological record displaying numerous local and regional variations. Nevertheless, we believe that the many newly discovered Bronze Age houses, and the strikingly similar distribution of Bronze Age burial sites and of settlements containing houses of Bronze Age date that can now be demonstrated across large parts of Jutland, demonstrate, as in Thy, a prehistoric reality that the many source-related problems cannot fully obscure or negate.

This conclusion is also supported by the findings of an investigation into the relationship between pollen data and the archaeological record (Søsted & Meistrup-Larsen 2003). In an unfortunately unpublished study at the University of Copenhagen, the authors have examined pollen data from lakes in various parts of Denmark and compared them with the number of archaeological sites within a radius of 5 km. For both the Early and Late Bronze Age and the Pre-Roman Iron Age, the archaeological record can, according to K.H. Søsted and L. Meistrup-Larsen, explain a significant proportion of the variation seen in the pollen data. Similarly, it could be demonstrated that a series of pollen types, which are anthropogenic indicators, show a positive correlation with the archaeological data from the three periods (Søsted & Meistrup-Larsen 2003, 137; for the Late Bronze Age see also Odgaard 2006, 349). This correlation was found both when all sites were included and when compared solely with the number of burial sites. Unfortunately, the investigation does not cover southern Jutland, but in all the investigated areas for which there are regional pollen diagrams from lake deposits – northern



BACK TO CONTENT

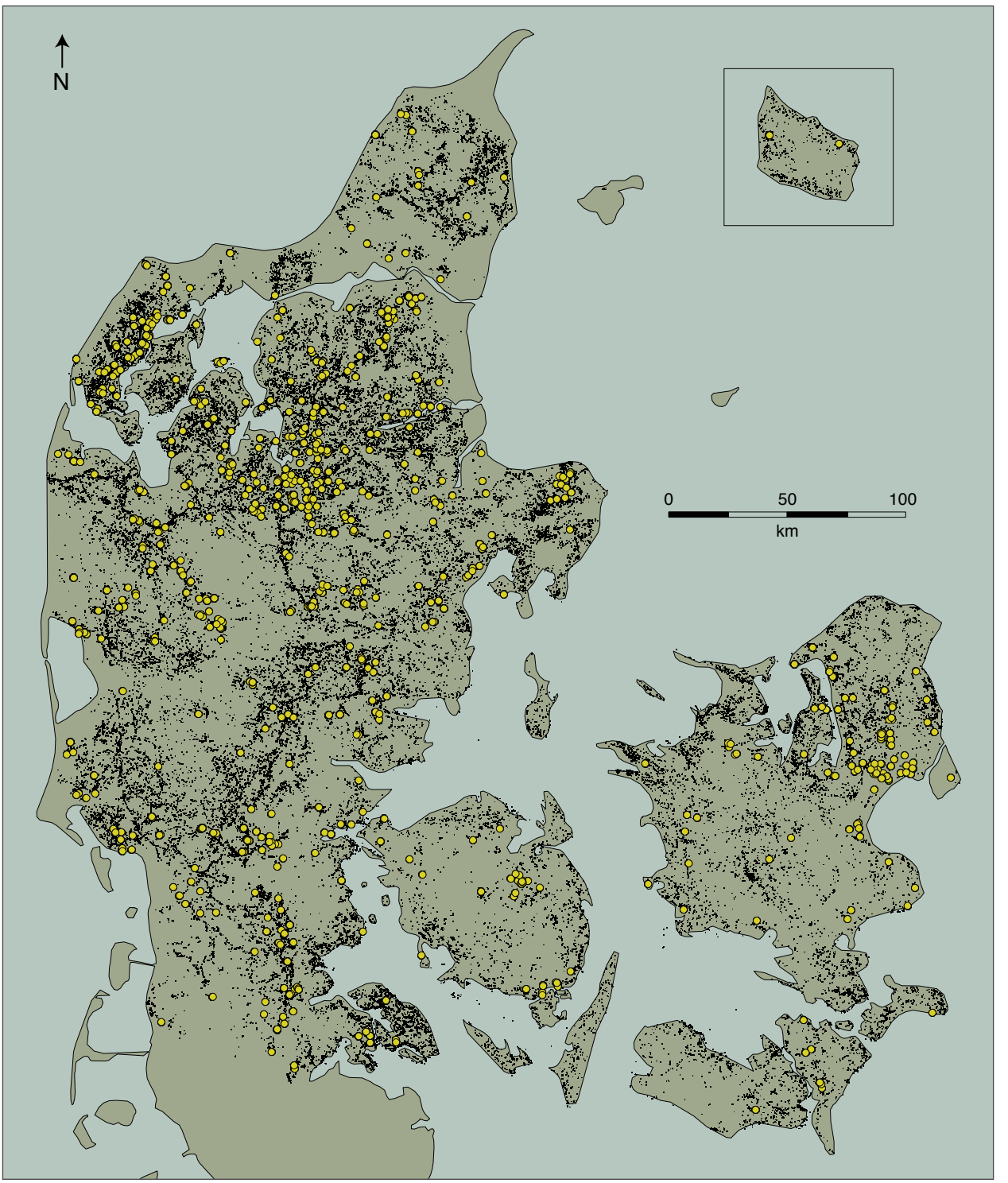



*Figure 2.2. The distribution of all Bronze Age sites with houses (yellow dots, FF code BXXX) against the background of the distribution of all prehistoric barrows in Denmark based on the records from the Danish Agency for Culture's Sites and Monuments register (February 2016)(https://www.kulturarv.dk/ffreg).*

Zealand, southeast Funen, western Jutland, eastern Jutland, northern Jutland south of the Limfjord and Thy – the Bronze Age burial sites constitute a significant measure of human presence.

This confirms S. Müller's early theory about a close connection between barrows and habitation (Müller 1904, 56) that can now be demonstrated through a direct comparison of the distribution of burial finds



BACK TO CONTENT

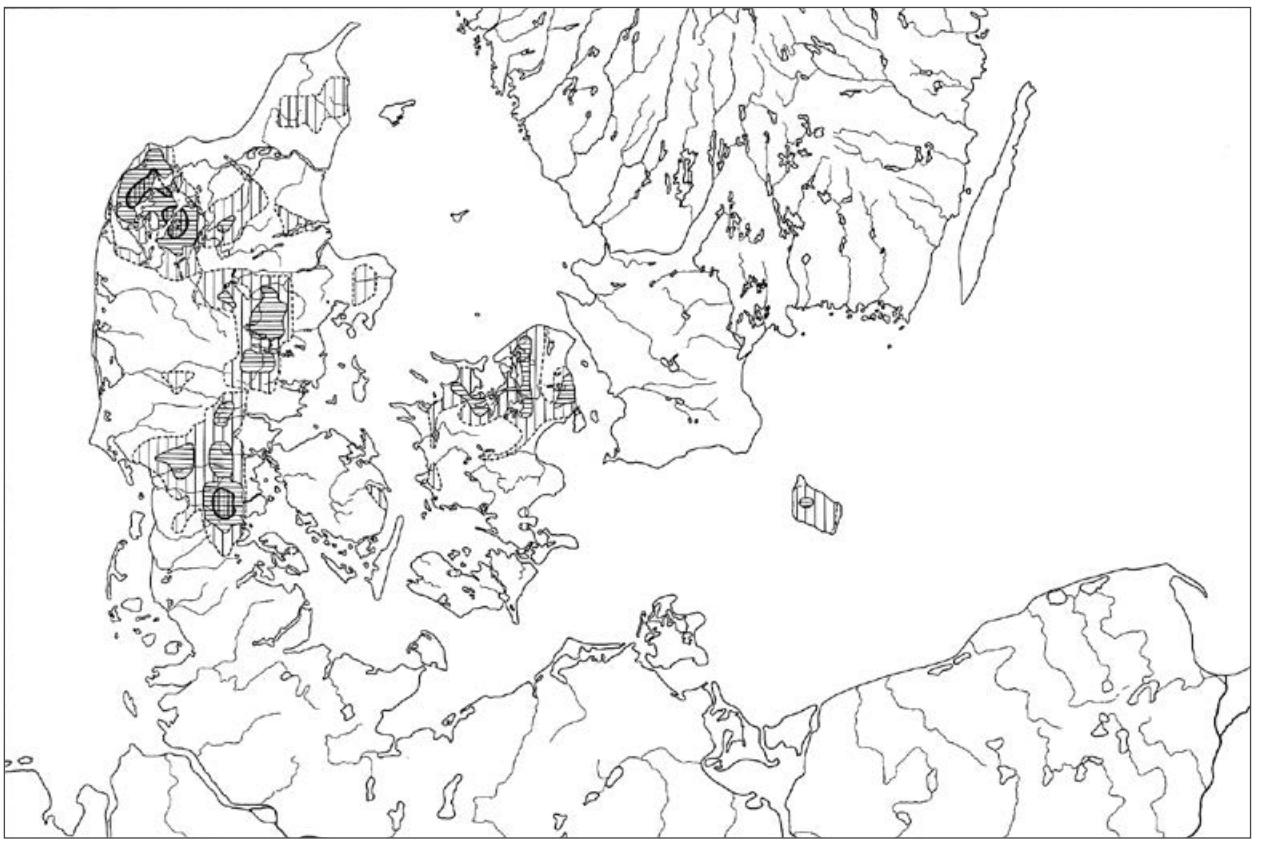


*Figure 2.3A. Isometric map showing the relative number of Early Bronze Age burials in Denmark. After Baudou (1985). The burial density is shown according to calculations based on the mean number (M) of Early Bronze Age burials pr. 109 km² in Denmark. The thin line delimits areas with M = 18 burials. The thick line delimits 2M = 36 burial finds. The broken line delimits M/2 = 9 burials. Areas with burials of less than M/2 pr. 109 km² are not shown.*

and of excavated Bronze Age houses (fig. 2.2). Many settlements with houses are yet to be found, but it is evident that almost all excavated Bronze Age houses are located in areas with barrows, as predicted by Müller. However, as the barrows include monuments from the Neolithic, especially the Single Grave culture (Holst *et al.* 2013), we need also to look specifically at the distribution of Bronze Age houses compared to that of sites with finds from Bronze Age burials (almost 100% found in barrows).

The isometric maps published by E. Baudou in 1985 are still useful for demonstrating the areas with the largest number of known burial sites in Denmark (Baudou 1985, 76ff). For Jutland, the Early Bronze Age sites (fig. 2.3A) are concentrated within a broad band extending southeast from Thy and the Limfjord area to central Jutland, where it then follows the north-south watershed to the eastern part of southern Jutland and the area around the river Kongeå. In the Late Bronze Age (fig. 2.3B), the number of burial sites in Thy and Salling declines somewhat but, at the same time, a marked concentration is apparent to the southeast, in Himmerland and Fjends. However, in general the distribution remains the same as in the Early Bronze Age (Baudou 1985, 76).

Using the records from the Danish Agency for Culture's Sites and Monuments register, the distribution of settlement sites with houses from the Early and Late Bronze Age in Jutland (fig. 2.4A-B) can now be compared with the distribution of burial finds from the same periods (fig. 2.3A-B). Both sets of maps show the same major trends, and it is evident that the main distribution areas for house sites in the Early Bronze Age (fig. 2.4A), fall, to a very large extent, within the isometrically-marked areas for the main distribution of burial sites (fig. 2.3A). With minor variations, the same is also true for settlement sites from the Late Bronze Age (fig. 2.4B compared with fig. 2.3B), where especially the concentrations of house sites in western Himmerland and the area around Viborg match the many burial sites.

Apart from some minor variations, the main distribution of sites with Early Bronze Age houses (fig. 2.4A) is also very similar to that of sites with houses from the Late Bronze Age (fig. 2.4B). There are, however, differences in the relative density of sites in the



BACK TO CONTENT

*Figure 2.3B. Isometric map showing the relative number of Late Bronze Age burial sites in Denmark. After Baudou (1985).*

various regions over time. As mentioned above, the number of house sites in Himmerland and around Viborg is markedly greater in the Late Bronze Age than the Early Bronze Age (cf. Christiansen 2012). The opposite trend is seen in southern Jutland, where the number of sites with houses declines in the Late Bronze Age. This is explained by P. Ethelberg as being the result of a recession and a decrease in population density (Ethelberg 2000, 247; see also Holst *et al.* 2013).

In order to obtain better chronological resolution relative to some of these general variations, the focus will now be shifted to records of radiocarbon-dated Bronze Age houses, beginning with the evidence from Thy.

## Radiocarbon-dated Late Neolithic and Bronze Age houses

As a result of ongoing research in the years following the publication of *Bronzealderens bopladser i Midt- og Nordvestjylland* (Bronze Age settlements in central and northwest Jutland) (Bertelsen *et al.* 1996),[3] an extensive series of radiocarbon dates for prehistoric houses is now available from Thy. Consequently, it has been possible to make systematic comparisons with radiocarbon-dated house sites along other parts of the North Sea coast, from Rogaland in the north, through southern Jutland to the Netherlands in the southwest. As developments during the Early Bronze Age cannot be seen in isolation from events in preceding centuries, radiocarbon dates for Late Neolithic houses were also included in this analysis.

To date, about 200 houses in Thy have been dated to the Late Neolithic or Early Bronze Age by standard archaeological methods: artefact diagnostics and house typology.[4] More than a fifth of these have also been radiocarbon dated and will, as a starting point, be regarded as a representative sample of the house remains from the periods in question (fig. 2.5 and vol. I, appendix B).

As a hypothesis, the same is assumed to be true for the radiocarbon-dated houses in other areas included in the following comparisons. However, as already pointed out by Bourgeois and Arnoldussen (2006),



BACK TO CONTENT

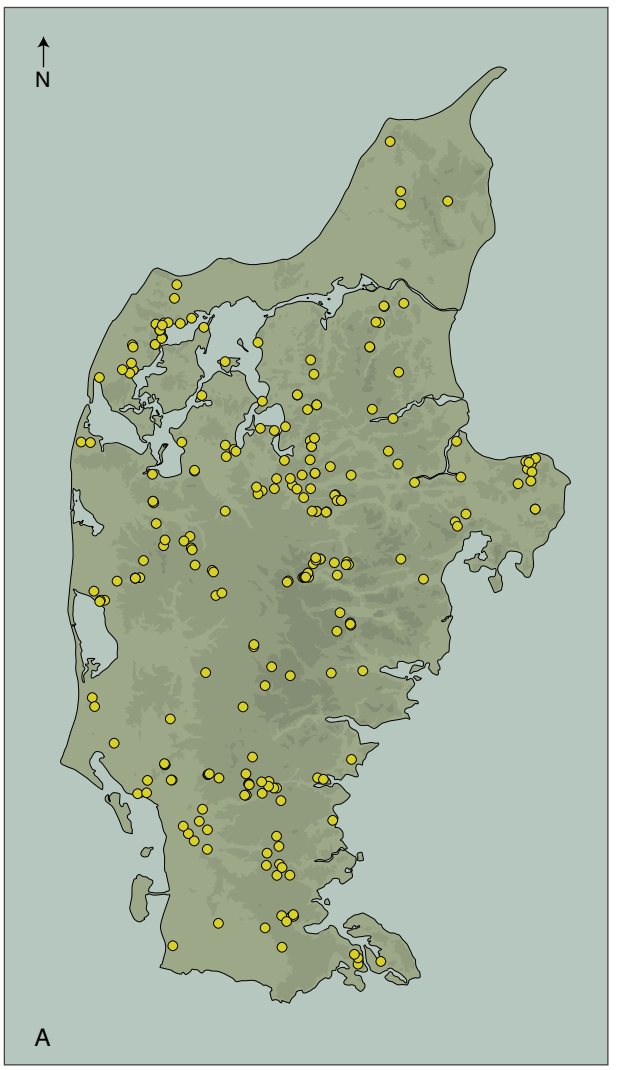



*Figure 2.4A. Sites with houses from the Early Bronze Age in Jutland (FF code BÆXX) according to data from the Danish Agency for Culture's Sites and Monuments register (February 2016). Unlike figure 2.2, which shows all sites with houses dated to the Bronze Age, figure 2.4A-B only deals with sites in the database that are specifically dated to the Early and/or Late Bronze Age, respectively.*

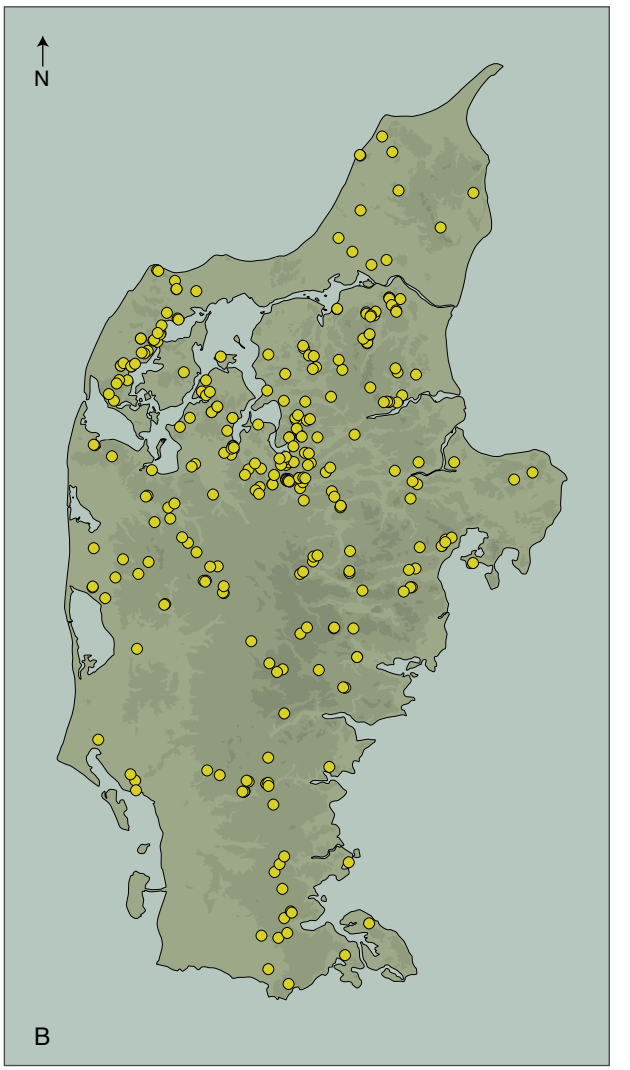



*Figure 2.4B. Sites with houses from the Late Bronze Age in Jutland (FF code BYXX) according to data from the Danish Agency for Culture's Sites and Monuments register (February 2016).*

before attempting to interpret variations in the radiocarbon dates from the different regions, it is important to bear in mind that the number of radiocarbon dates available is a result of the choices made by archaeologists with respect to which houses (and which material) should be dated. Less well-preserved houses, or houses that for some reason have a low archaeological visibility, are therefore likely to be underrepresented. Despite such relevant source-related considerations, we find it pertinent to examine these radiocarbon dates in order to investigate whether anything other than merely variation in archaeological visibility could be behind the observed regional differences.

For comparison with the situation in Thy, houses in southern Jutland with radiocarbon dates from the Late Neolithic and the Bronze Age were selected: a total of 72 (fig. 2.6 and vol. I, appendix C). These have primarily been published by P. Ethelberg (2000), but are augmented by recently investigated but unpublished sites mainly within the working area of the Museum of Southern Jutland and the Museum on Sønderskov. This dataset makes it possible to compare these two areas which, during the entire Early Bronze Age, belonged to two distinct cultural areas or regions. In the 16th century BC, northern Jutland and Thy were part of the Valsømagle region,



BACK TO CONTENT

| THY | LN-EBA I (2350-1500 BC) | BA II-VI (1500-500 BC) |
|---|---|---|
| Number of habitation areas with houses | 9 | 34 |
| Number of houses | At least 27 | At least 198 |
| Number of radiocarbon-dated houses | 5 (18.5%) | 47 (23.7%) |

*Figure 2.5. Late Neolithic and Bronze Age house sites and habitation areas in Thy with a minimum number of houses and radiocarbon dates.*

while southern Jutland belonged to the Sögel-Wohlde region; there were marked regional variations in material culture and burial rites between these two regions (Vandkilde 1996, 289ff; Bergerbrandt 2007, 38ff). This geographical distinction continued during Early Bronze Age periods II-III (Kersten 1935).

From a North Sea perspective, Rogaland, located to the north of Thy, across the Kattegat in southern Norway, is an obvious region to include in our comparisons. A large number of Late Neolithic and Bronze Age houses have been radiocarbon dated in the region (fig. 2.12 and vol. I, appendix D) and, furthermore, the existence of links between southwest Norway and northern Jutland has previously been proposed on the basis of similarities in the actual graves and grave furnishing (Lund 1938; Møllerop 1963; Marstrander 1977; Løken 1989; Myhre 1998; but see also Hornstrup 2011). Even Norwegian archaeologists admit that southwest Norway could actually be termed a Danish province in the Bronze Age (Magnus & Myhre 1976, 146).

Finally, in order to compare southern Scandinavia with the southernmost region along the North Sea coast possessing a shared house-building tradition, a number of dates from Bronze Age houses in the Netherlands augment the dataset. The resulting database includes a total of 453 radiocarbon dates from about 200 Late Neolithic and Bronze Age houses in Jutland and southwest Norway,[5] supplemented by 87 dates from Dutch Bronze Age houses (Arnoldussen & Fontijn 2006, appendix 1).

In order to obtain an initial overview, four cumulative probability density functions (cPDFs) for dates from 1) Rogaland, 2) Thy, 3) southern Jutland and 4) the Netherlands have been calculated (Olsen & Kanstrup this chap., fig. 2.C). Even taking into account the problems involved in using cPDFs (Olsen & Kanstrup this chap.), it is evident that the dates from these different regions display temporal differences that, at least with regard to Rogaland, are so marked that it can hardly be a coincidence. Southern Jutland and the Netherlands generally correspond fairly closely in their development, while the cPDF from Thy reveals a greater number of dates from around 1000 BC than in the two other areas. This difference will be discussed further below when comparing Thy with southern Jutland. In order to provide some cultural-historical background for these comparisons, we will now discuss the emergence of the three-aisled house at the transition between the Late Neolithic and the Bronze Age in the regions in question.

# The Bronze Age farmstead

## The introduction of the three-aisled house

The introduction of the three-aisled house to southern Scandinavia has been discussed by several scholars over the last 25 years (Becker 1968; Rasmussen & Adamsen 1993; Nielsen 1997; Ethelberg 1993, 2000; Artursson 2005). A new chronological element has been introduced into this discussion by the publication of a very early example of a three-aisled house at Kvåle in Jæren, Rogaland (Soltvedt *et al.* 2007).

Three almost identical radiocarbon dates from the three-aisled house 3 at Kvåle demonstrate, without any doubt, the introduction of this house type around 1700 BC (cf. vol. I, appendix D). This makes it the oldest house of its type in Norway and it may even be contemporaneous with the very early house II of the same type at Højgård in southern Jutland (fig. 2.7) (Soltvedt *et al.* 2007, 75; Ethelberg 2000, 174ff; Bech & Olsen 2013, 14ff). There was previously some doubt surrounding the early date of the Højgård house (Nielsen 1997, 9). However, in the light of the new data from Kvåle, there is probably now no reason to question this as it clearly demonstrates that southwest Norway was intimately connected with the development of house-building traditions in Jutland in the Early Bronze Age.

As indicated by the Norwegian and Danish dates for late two-aisled and early three-aisled houses, there appears to have been a transitional phase during which both house types – or hybrids between them – occurred at the same time (see also Artursson 2005, 53; Soltvedt *et al.* 2007, 93; Fokkens & Arnoldussen 2008, 12). This is illustrated by several Danish and Norwegian examples.[6]

Two rare examples of a hybrid between two- and three-aisled houses are the buildings at Ginnerup, Thy, and Fjordglimt, close to the Limfjord near Skive. They have both been radiocarbon dated to period



BACK TO CONTENT

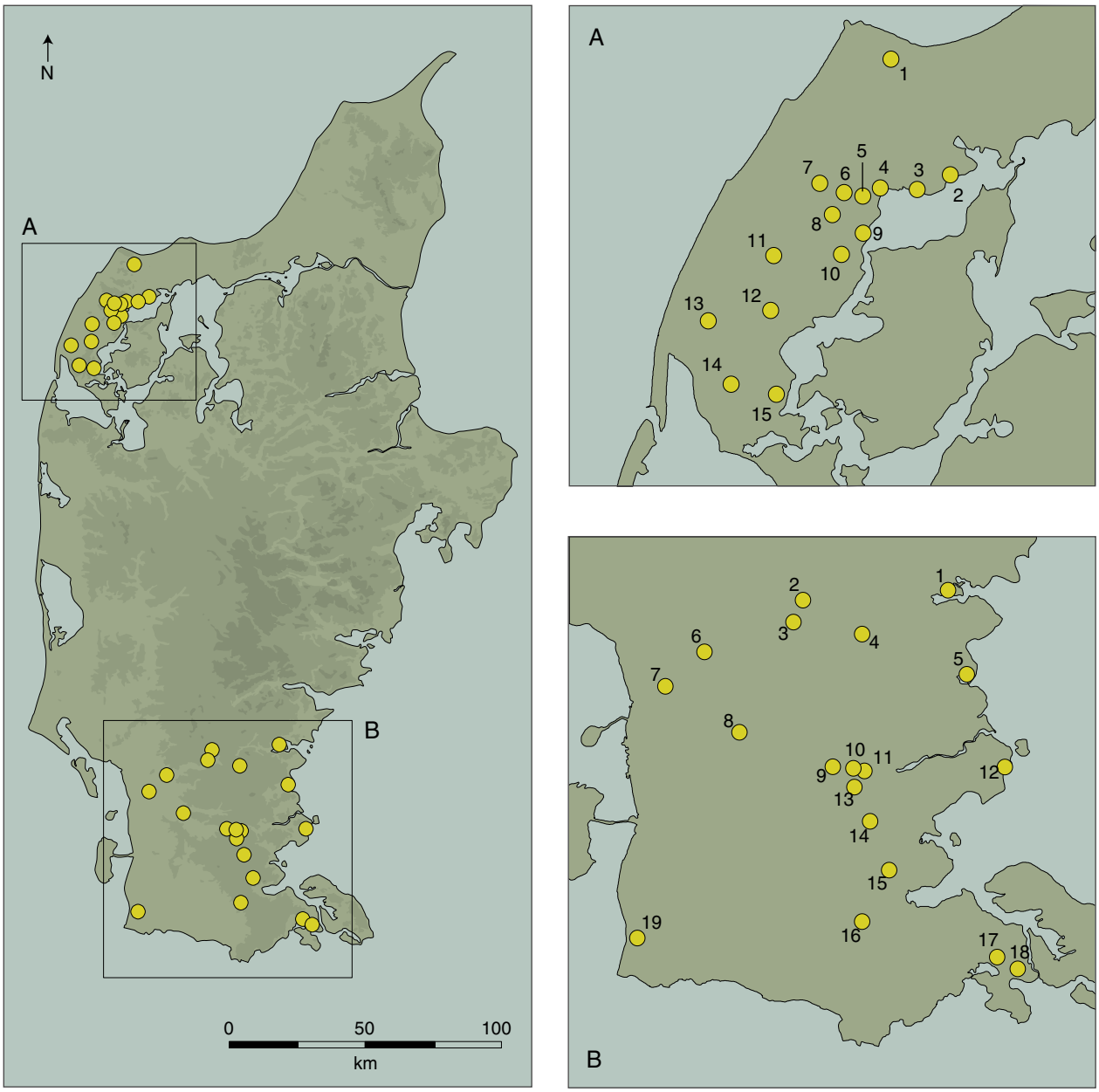



*Figure 2.6. Map of sites in Thy and southern Jutland with radiocarbon-dated Late Neolithic and Bronze Age houses.*

*A. Thy: 1) Bjerre (site no. 110211-32), 2) Sennels (site no. 110208-105), 3) Storodde (site no. 110308-16) + Fårtoft (site nos. 110309-71, -83, -84, -85), 4) Drengshøj (site no. 110309-82) + Landlyst (site no. 110309-80), 5) Vestermark (site no. 110310-74), 6) Tinggård (site no. 110305-264), 7) Klostergård (site no. 110313-125), 8) Kallerup (site no. 110303-99), 9) Vilhøj (site no. 110307-124), 10) Sundby (site no. 110111-117), 11) Legaard (site no. 110112-279) + Sønderhå 5 (site no. 110112-313), 12) Ingersminde (site no. 110104-98), 13) Ørum (site no. 110115-32), 14) Ulsted (site no. 110612-429), 15) Ginnerup (site no. 110605-128).*

*B. Southern Jutland: 1) Drejens Boligby (site no. 170206-81 + Drejens Boligby II (site no. 170206-72), 2) Vestervang V (site no. 190103-67), 3) Mannehøjgård I (site no. 190307-192) + Kongehøj II (site no. 190307-208), 4) Bønstrup Industripark (site no. 190109-79), 5) Trappendal (site no. 170702-27), 6) Skelhøj (site no. 190303-95), 7) Nygårdstoft (site no. 190401-45), 8) Højgård (site no. 200201-170), 9) Valsbækvej (site no. 200208-101), 10) Brødrene Gram (site no. 200208-18), 11) Over Jernhyt (site no. 200202-147), 12) Flovt Strand (site no. 200311-274), 13) Kesmajgård (site no. 200210-361), 14) Sortpot (site no. 220304-283), 15) Egelund I (site no. 220204-208) + Egelund 2 (site no. 220204-195) + Brunde (site no. 220204-161), 16) Bolderslevskovvej (site no. 220201-26), 17) Bøgegård Vest I (site no. 230304-205), 18) Dybbøl Vesten (site no. 230302-209), 19) Marskhallen (site no. 210204-3).*



BACK TO CONTENT

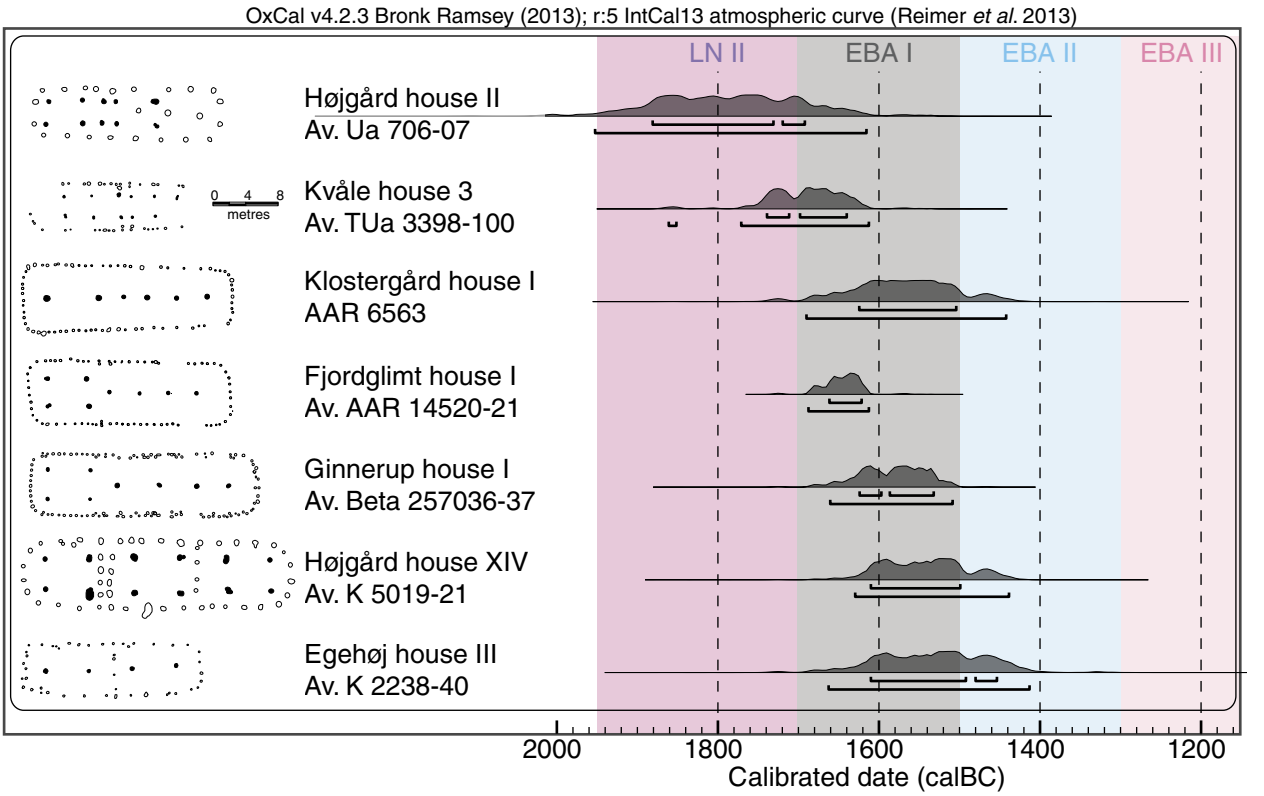



*Figure 2.7. Late two-aisled and early three-aisled Bronze Age houses in Rogaland, southwest Norway and in Jutland.*

I (figs. 2.7) (Bech & Olsen 2013, 15). A new hybrid between a two- and a three-aisled house has recently been found at Tjora, Rogaland, (house 10) and likewise dated to period I (Fyllingen & Armstrong 2012, 36ff, 75f). The two-aisled Klostergård house in Thy (fig. 2.7) belongs to the same period. The late dates for the two-aisled Egehøj houses on the Djursland peninsula have been discussed previously on several occasions (Ethelberg 1993, 154; Rasmussen 1993b) as these appear to post-date the first three-aisled houses (see also Boas 1983, 99ff). However, on present evidence, they fit well into the transitional phase that preceded the general introduction of a three-aisled construction (fig. 2.7).

As for the Dutch three-aisled houses, S. Arnoldussen argues that the rather early radiocarbon dates previously published are not to be trusted and that this house type most likely did not come into use until near the end of the 16th century BC (2008, 185ff). This conclusion is based upon direct dating of preserved construction timber from five houses. However, even though the early dates are indirect and may not match present standards, several of them are identical with the early dates from southern Scandinavia (Arnoldussen 2008, tab. 5.2; Fokkens 1999, 36) which means that a somewhat similar introduction in the Netherlands of this house type must be considered.

Based on the early dates for the Danish Højgård houses (illustrated in this chap., figs. 2.7, 2.9 and in Bech & Olsen 2013, fig. 3), P. Ethelberg proposes that the three-aisled house type was invented in southern Jutland and South Schleswig (south of the present Danish-German border) and from here spread to other areas of northwest Europe and southern Scandinavia (2000, 174). An argument in favour of Ethelberg's hypothesis is the significant house construction activity, as demonstrated by the cumulative probability distributions (above), that began before the end of Bronze Age period I in southern Jutland, i.e. earlier than in Thy. Innovations in house construction are perhaps more likely to take place in a phase of expansion like this, rather than in periods of regression. However, it is wise to exercise caution and to remember that, to date, Højgård house II is the only example from southern Jutland that possibly predates other early three-aisled Bronze Age houses found elsewhere. Ethelberg's case seems likely to be impossible to prove and other houses of a comparable early date (to that of Højgård house II) may turn up in the future anywhere within the traditional area for three-aisled houses in southern Scandinavia or, for that sake, down along the North Sea coast as far as the Low Countries.

But what was the reason for this change from two-aisled to three-aisled house construction? Over the years, many authors have cited indoor housing of



BACK TO CONTENT

cattle as being one explanation (e.g. Rasmussen & Adamsen 1993, 138; Ethelberg 2000, 203; Mikkelsen & Kristiansen vol. II, chap. 29). However, we will argue below that the change had nothing to do with the introduction of byres as these first appeared around 1500 BC and by this time three-aisled construction had already been in evidence for at least a hundred years or more (Fokkens 1999, 36).[7] There is perhaps no better explanation than that this construction principle made it easier to build houses that were both wider and higher, thereby enabling the construction of more impressive buildings such as the very large Early Bronze Age houses seen at for example Højgård and Brødrene Gram in southern Jutland that then constituted models for the appearance of more normal-sized houses (Nielsen 1997, 26). The reason for the long-term success of the new type of house construction that became the standard across large parts of the North European lowlands until the beginning of the Middle Ages was its great practicality: It made it easy to divide the house into sections for different functions and to construct a loft for the storage of supplies and provisions.

## Bronze Age three-aisled houses in southern Jutland and Thy

Through comparison of the three-aisled houses in southern Jutland with those in Thy, the advantages of a regional approach become evident. In addition to numerous common traits, several clear differences also emerge, not only in relation to house construction and the size of the buildings but, perhaps more unexpectedly, also in their chronological distribution.

Of the presently 46 radiocarbon-dated three-aisled houses in Thy, most lie within an area of about 30 km in diameter situated in the northern part of the region near the town of Thisted (fig. 2.6, vol. I, appendix A-B). The houses in southern Jutland employed in the comparison (presently 55 radiocarbon-dated three-aisled buildings) are located primarily between Ribe and Haderslev (in areas around the rivers Ribe Å and Kongeå) – maximum extent 50 km NW-SE (fig. 2.6, vol. I, appendix C).

Within both areas, the nature of the material used for the radiocarbon dates varies. Materials of limited biological age, such as cereal grains, are of course preferable. Among the least suitable is oak charcoal, where the considerable biological age of the sample may influence the precision of the date. Information about the nature of the dated materials, and their origin, should therefore ideally be cited in order to make it possible to evaluate the credibility of the dating results (cf. K.L. Rasmussen 1993). Regrettably, this is not the case for the dates from southern Jutland published in Ethelberg (2000). However, as in Thy, most of these are AMS (Accelerator Mass Spectrometry) dates, for which mainly material of limited biological age, such as grain, was used (Bech & Hornstrup 2013, fig. 5; see also appendices B-C).

Ideally, more than one radiocarbon date per house is required to provide a reasonable degree of certainty with respect to the accuracy of the overall dating. The average number for Thy and southern Jutland together is 2.11 dates per house, whereas 26% of the Thy houses have only one date, and the proportion with only one date in southern Jutland is somewhat greater (38%).

Comparing the summed probability functions from Thy and southern Jutland (Olsen & Kanstrup this chap., fig. 2.C:c-f), the main difference is the rather abrupt decline in the number of dates at the beginning of period III, c. 1300 BC, apparent at many sites in southern Jutland, while in Thy there are still numerous dates from period III and, for the site of Fårtoft/Storodde, even well into period IV, c. 1000 BC.

As changes in building construction took place during the Bronze Age, with wall posts becoming less deeply founded (Ethelberg 2000, 186; Guldager 2007, 45; Christiansen 2012, 75), a greater percentage of the later houses do not have remains of walls, but only traces of roof-bearing posts preserved. This clearly effects the representativity of the dated Late Bronze Age houses in Thy and very probably also in southern Jutland. It is therefore fair to ask whether this is the reason for the decrease in the number of dated houses from period III in southern Jutland. However, as many houses of the same date in Thy have preserved wall lines, it is worth considering whether the difference seen in the dates between the two areas may result from some kind of economic regression in southern Jutland during period III, i.e. at a time when activity in Thy was high and apparently even on the increase (Bech & Hornstrup 2013). Before looking at differences of this kind, we shall now probe more deeply into the regional variations in construction principles between Thy and southern Jutland.

## Construction principles in Thy and southern Jutland compared

With very few exceptions (Bjerre 3, house II (Bech vol. II, chap. 13) and perhaps Legaard house I (Mikkelsen & Kristiansen vol. II, chap. 29)), all Thy buildings included in this overview are interpreted as dwelling houses, normally with room for storage and perhaps also a byre. The same is also true of the houses in southern Jutland, with the exception of the smaller frame-built buildings from the Early Bronze Age (Ethelberg 2000, 209ff). The question of byres in Bronze Age houses in Jutland is discussed below.



BACK TO CONTENT

The date, size and construction of a selected number of radiocarbon-dated houses in Thy and southern Jutland are illustrated in figures 2.8-9. The chronology is according to H. Vandkilde *et al.* (1996). Although the length of the individual Bronze Age periods may require minor correction (Lanting & van der Plicht 2003; Olsen *et al.* 2011; Hornstrup *et al.* 2012), this is not crucial for the following interpretation.

First of all, despite obvious common traits, it is evident that there are also clear differences in size and outer wall construction between houses in Thy and those in southern Jutland. In the open Bronze Age landscape of Thy, timber resources for solid house construction were apparently already scarce during period II of the Early Bronze Age, and this is reflected in the widespread use of wattle-and-daub technique in wall constructions with closely-spaced postholes (fig. 2.8) (see also Bech & Olsen vol. I, chap. 4). This contrasts with the houses in southern Jutland (fig. 2.9), where another type of wall construction, with a greater distance between the postholes (1.5-2 m) was standard during the Early Bronze Age and is generally interpreted as being a consequence of the use of bole walls (Ethelberg 2000, 186ff).

The large bole-walled houses of southern Jutland, with floor areas of up to 500 m$^2$, are particularly worthy of note. Although large houses are known from the Late Neolithic in other parts of southern Scandinavia (Poulsen 2009), some even with bole walls (Boas 1991, 96), this type of house, with rounded gables and a three-aisled construction, was new. Buildings of this type were first recognised in western Jutland as one of the many results emerging from C.J. Becker's excavations. Due to their size, they were initially not even termed houses, but 'halls', and, according to Becker (1972, 14f), they were dated to the Late Bronze Age. Based on results from the first excavations at Højgård, southern Jutland, P. Ethelberg (1987, 1993) was later able to demonstrate that Becker was wrong on this point and that this type of house belonged to the Early Bronze Age and was typical of the period in the western and southern parts of Jutland. Since then, numerous radiocarbon dates from southern Jutland have repeatedly confirmed this conclusion. The very early Højgård house II was of this type (fig. 2.9), but with a floor area of only c. 130 m$^2$ it was still of modest size. Not until late period I or early period II do we see the really large, almost monumental, examples of this house type in southern Jutland, as for example Højgård house XXXI (fig. 2.9).

The number of occupants in Bronze Age houses no doubt varied from single-family households, with perhaps six to ten members, to an extended family of 10-15 individuals or perhaps even two families (Sørensen 2010; see also Bech & Olsen below chap. 4). However, house size reflected not only the number of occupants and the functions of the house (whether a byre or barn was included), but also status and economic power (P.O. Nielsen 1997, 26, 1999, 159; Earle 2002, 2004; Artursson 2005, 2007, 80ff; Holst *et al.* 2013). In other words, the very large bole houses doubtless became a model for the way in which power and influence should be demonstrated (Nielsen 1997, 26; Kristiansen 1998a, 287). Probably few would question the high, even chiefly, status of the households occupying these large buildings with a floor area of almost 500 m$^2$ as seen at Brødrene Gram and Højgård.

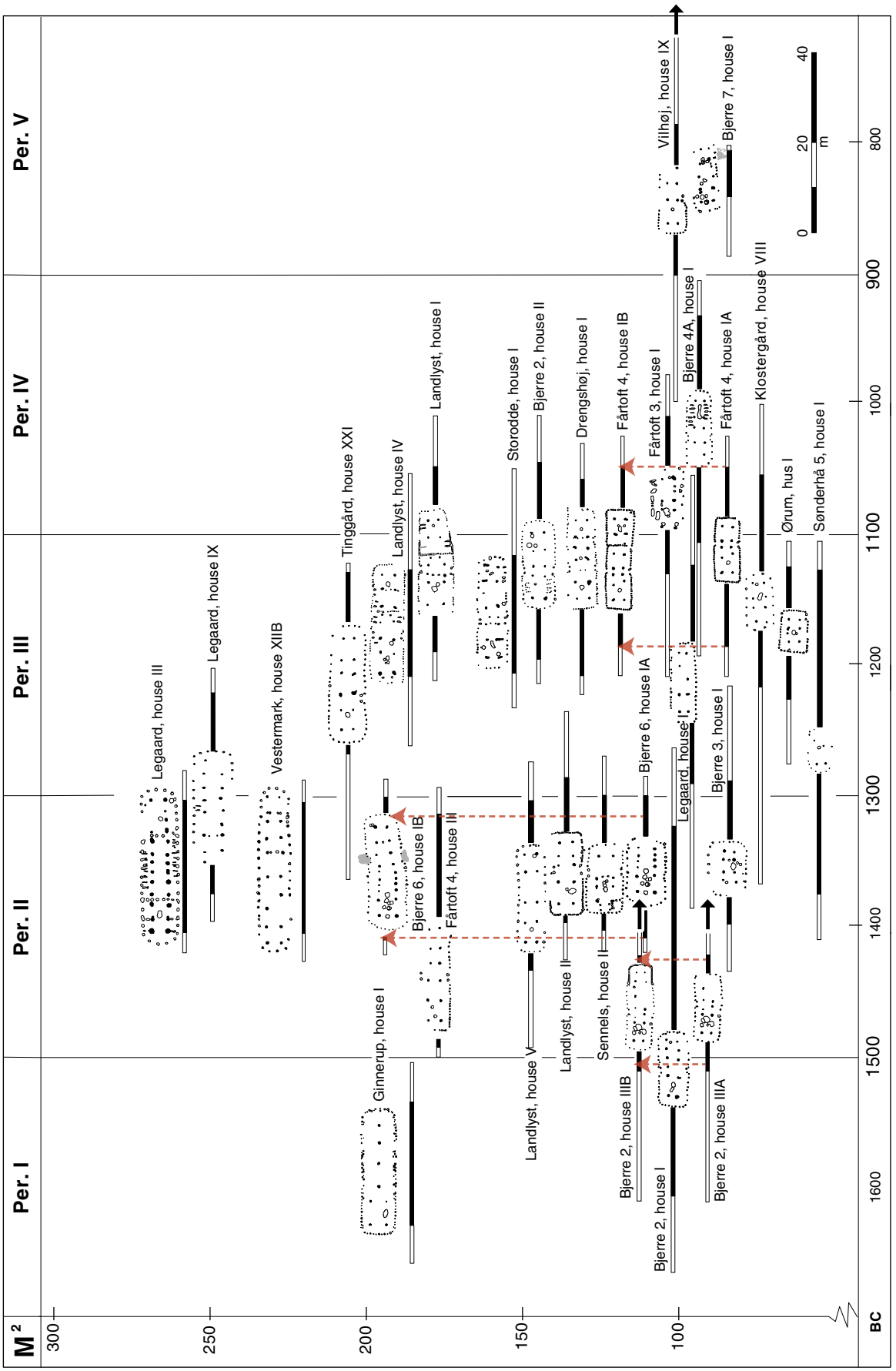
Comparing figures 2.8 and 2.9, it is evident, as P. Ethelberg (1993, 154) has also pointed out, that the larger houses in southern Jutland tend to be concentrated in the first half of the Early Bronze Age (periods I and II). These very large houses, with floor areas of between 400 and 500 m$^2$, also appear to be somewhat earlier than the largest houses of this type seen at Legaard and Vestermark in Thy (fig. 2.8). The latter are dated to the second half of period II and the transition to period III and have floor areas not exceeding c. 260 m$^2$. They can be compared with a number of similarly sized houses in southern Jutland, such as Højgård house I and Brødrene Gram houses I and III (fig. 2.9). They do not correspond to the highest social stratum here, but may represent a lower but still powerful and influential element in society. As already mentioned above, the small number of these very large, timber-consuming buildings in Thy no doubt reflects the open, almost treeless landscape of the region (Andersen 1995a-b; Søgaard *et al.* vol. I, chap. 8, Andersen vol. I, chap. 9). In our opinion, it is therefore fair to say that the large Legaard and Vestermark houses represent the highest level of Bronze Age society in Thy, not least due to their great consumption of solid timber (Bech & Olsen vol. I, chap. 4; but see also Mikkelsen & Kristiansen vol. II, chap. 29). A comparable elite level may be represented in the burial sites by the two rich male and female burials at Egshvile (Olsen 1992; Hornstrup 1998, 27ff).

During period III, houses were scaled down: In southern Jutland they quickly declined to a level where buildings with a floor area greater than 200 m$^2$ are rarely found. The only exception is a house at Sortpot, dated to periods IV/V, which does not fit the picture and most probably is incorrectly dated (based only on a single radiocarbon date; see below Bech & Olsen vol. I, chap. 4).[8]

In contrast to the rapidly declining house sizes seen in southern Jutland after period II, a group of period III and period III/IV houses in Thy stand out, with floor areas ranging from c. 125-200 m$^2$. New factors appear to be at work here, resulting in the continued construction of moderately large houses at a time when similar houses were rare in southern Jutland.



BACK TO CONTENT






BACK TO CONTENT

◀ *Figure 2.8. Selected radiocarbon-dated Bronze Age houses in Thy arranged according to size and calibrated radiocarbon dates. The dating of each house is shown as a horizontal bar (black: 1 σ, white: 2 σ). Where more than one radiocarbon date is available, an average of the dates is given (see list of dates in vol. I, appendix B). Calibration of dates is according to oxCal ver. 4.2. Red arrows: Enlargements of houses (cf. Bech & Olsen vol. I, chap. 4).*

This may be due to a greater frequency of houses with two habitation units in Thy than in southern Jutland (see Bech & Olsen below, chap. 4).

There are evidently also more houses in Thy dated to period III and periods III/IV than is the case further south in Jutland where, judging from the radiocarbon dates, houses from this time appear to be rare. It is always problematic to argue on the basis of absence. Nevertheless, it is tempting to see this phenomenon as being related to the observed decrease in the number of houses and settlement sites between the Early and Late Bronze Age in southern Jutland (Ethelberg 2000, 247). However, some questions still remain to be answered as the regional pollen diagram from Abkær Mose in southern Jutland shows no decline in activity from the Early to the Late Bronze Age – quite the opposite (Aaby 1986).

## Large houses and large barrows: A link

As pointed out by several authors, the dating of the large bole-walled houses coincides precisely with the very widespread construction of barrows within the realm of the Nordic Bronze Age. By virtue of their sturdiness and size, these large houses are often seen as a direct parallel to the monumentality of the barrows (Björhem & Säfvestad 1993, 356; Nielsen 1997, 26; Earle 2004, 120). In this respect, it is thought-provoking that the construction in Jutland of large bole-walled houses with a floor area exceeding 200 $m^2$ – apart from possible exceptions like the above-mentioned house at Sortpot – appears to have stopped at almost the same time as the upper stratum of Bronze Age society, especially in southern and western Jutland, stopped building large barrows containing oak coffins around 1300 BC (Christensen 1998; Bech & Olsen 2013). Hypothetically, this development can be seen in relation to the same series of events that seemingly led to a decrease in settlement and house construction in southern Jutland.

Employing a long-term model, the *Rise and Decline of the Bronze Age Farm* by K. Kristiansen (2006) illustrates the reduction in size of southern Scandinavian farms through the Bronze Age, following a gradually decreasing curve from a maximum between 1900 and 1400 BC (fig. 2.10). From 1400-1300 BC in particular, Kristiansen's diagram shows a steep decline in building size. Seen against the background of the regional evidence, the same fall is clearly visible in southern Jutland. Here, the decline is even steeper than that proposed by Kristiansen and takes place slightly later, between 1300 and 1200 BC. A similar development also took place in Thy, but over a longer period of time, from c. 1300-1000 BC, i.e. during periods III and IV (Bech & Olsen vol. I, chap. 4, fig. 4.3).

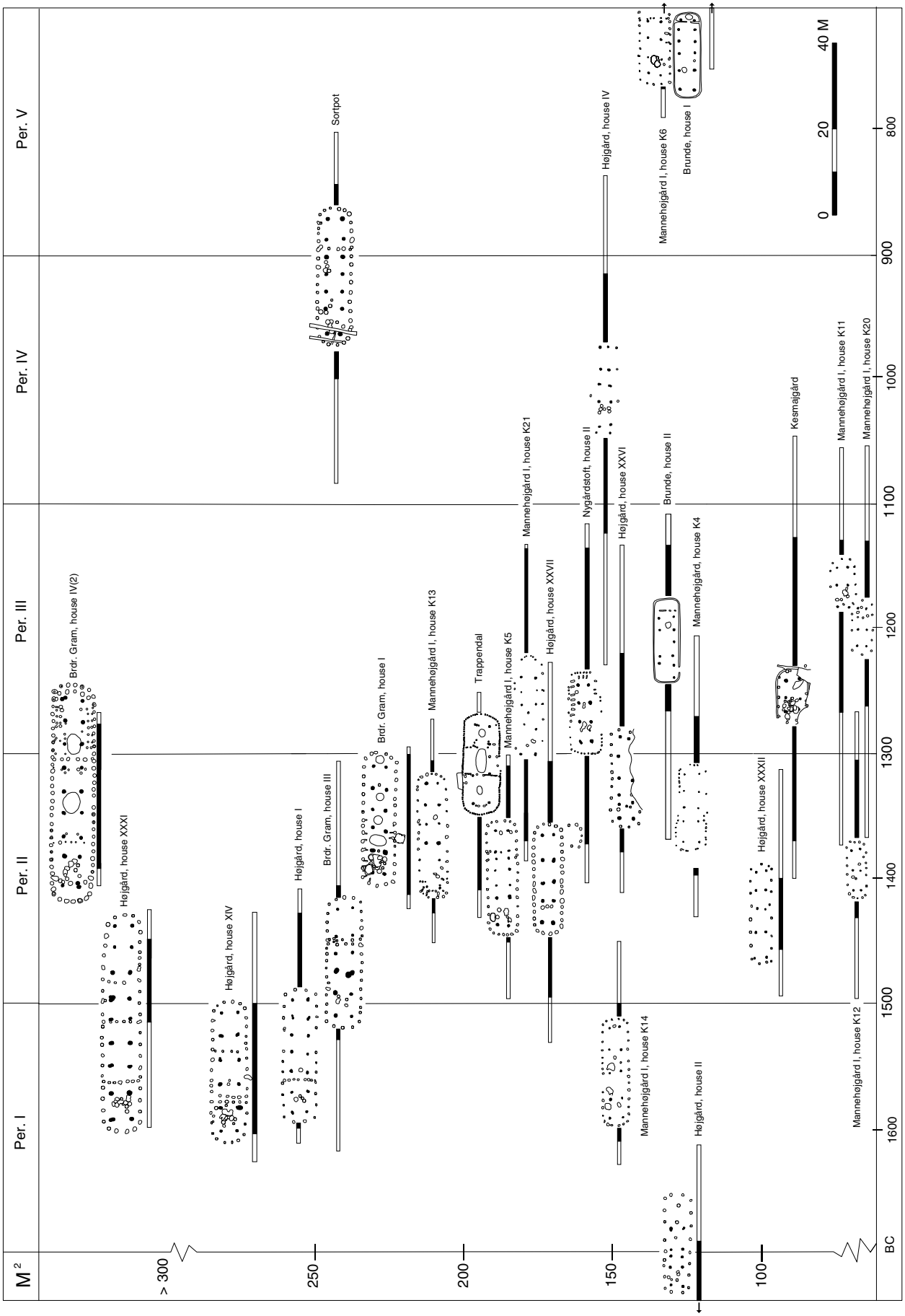
For a long time, period III in Thy, with its many burial finds – especially male graves containing swords, has attracted attention as being something special relative to other regions and periods (Randsborg 1975; Kristiansen 1978; Bech & Hornstrup 2013). The great wealth of metal evident during period III signals a boom in the economy, apparently also reflected in the both numerous and moderately large houses, radiocarbon dated to the period 1350-1100 BC. Recent findings from Thy, with a majority of newly discovered houses being dated to periods III and IV, bring the settlement evidence even more closely into line with the burials than was the case previously (Bech & Hornstrup 2013).

According to Kristiansen (1978, 1981, vol. I, chap. 3), settlement in Thy during period III led to a regional ecological crisis due to overexploitation of the landscape. Now, more than 35 years after Kristiansen first presented his crisis theory, the dense settlement of Thy at the end of the Early Bronze Age and the beginning of the Late Bronze Age is a documented fact and is also clearly reflected in the pollen data (Andersen 1995a-b, Bech & Hornstrup 2013, fig. 7). The reason why we are convinced that the many radiocarbon-dated Bronze Age houses from Thy reflect a prehistoric reality is the perfect fit between open-land/grassland indicators and the radiocarbon dates (fig. 2.11) as evidence of dense habitation and massive human impact on the environment, especially during Early Bronze Age period III and part of period IV.

However, the question of whether this habitation was of such a character that it exceeded the carrying capacity of the area and created a crisis remains open. The apparently scant settlement during periods V and VI could perhaps be an indication of problems of this kind. Answering this question is though beyond the scope of this chapter, but it is thought-provoking that similar 'boom-like' developments, followed by apparent reduced activity, can be observed during the Bronze Age not only in Thy, southern Jutland and the Netherlands, but also in Rogaland, as we will see below. The timing of these developments varies somewhat from region to region, but the mechanisms behind them were perhaps the same, including demographic oscillations as also demonstrated by recent use of cPDF-data from the British Isles (Stevens & Fuller 2012).



BACK TO CONTENT






BACK TO CONTENT

◀ *Figure 2.9. Selected radiocarbon-dated Bronze Age houses in southern Jutland arranged according to size and calibrated dates. The dating of each house is shown as a horizontal bar (black: 1 σ, white: 2 σ). Where more than one radiocarbon date is available, an average of the dates is given (see list of dates in vol. I, appendix C). Calibration of dates is according to oxCal ver. 4.2. House plans after Ethelberg (2000) and Laursen (2005).*

## Two-aisled houses in Rogaland

As mentioned above, a very high percentage of the radiocarbon dates from Rogaland in our database relate to two-aisled houses, whereas the opposite is true of the three other regions, where dates from three-aisled buildings dominate. The difference is clearly indicated by the cPDF for Rogaland, with a marked peak prior to 1500 BC – very different from the cPDFs from Thy, southern Jutland and the Netherlands (Olsen & Kanstrup this chap., fig. 2.C).

According to H. Vandkilde (2005), the beginning of the Late Neolithic in southern Scandinavia can firmly be dated to c. 2350 BC, with LN I ending about 1950 BC. This means that the majority of the dates from two-aisled houses in Rogaland fall within LN II and Early Bronze Age period I, with a clear peak around 1700 BC (Olsen & Kanstrup this chap., fig. 2.C:g-h).

In the Norwegian evidence, it is clear that the extensive use of radiocarbon dating, initiated with the excavations at Forsandmoen through the 1980s, has led to a broad range of houses, including minor structures, being radiocarbon dated in a much more comprehensive way than was generally the case in Danish research until recently. It is therefore pertinent to ask whether the many radiocarbon dates from Rogaland alone can be the reason for the difference in the number of dated two-aisled houses? The fact that this is not the case is demonstrated by the large number of radiocarbon-dated three-aisled houses in Jutland after 1500 BC (from Early Bronze Age periods II and III), which far exceeds the number of houses from the same period of time in southwest Norway. If there simply were a difference in the number of radiocarbon dates, this distribution would be difficult to explain. Neither is it likely that differences in excavation practices and techniques lie behind the observed differences, as excavation methods employed in southwest Norway were, to a great extent, inspired by Danish archaeology (Løken *et al.* 1996). In other words, everything suggests that the differences in the dating of the houses has a basis in actual archaeological conditions.

At present (February 2013), there are records of 26 two-aisled radiocarbon-dated houses at 13 different sites in Rogaland (fig. 2.12), e.g. Talgje,

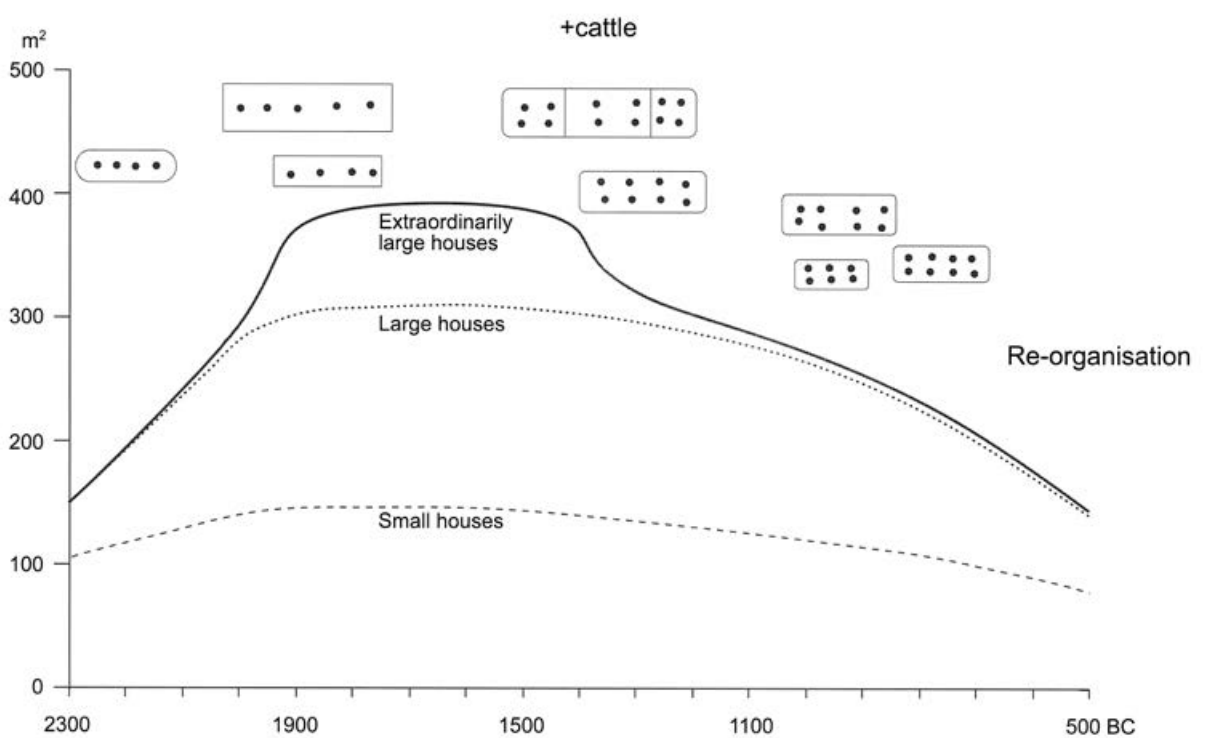



*Figure 2.10. Long-term model of the rise and decline of the Bronze Age farm. After Kristiansen (2006).*



BACK TO CONTENT

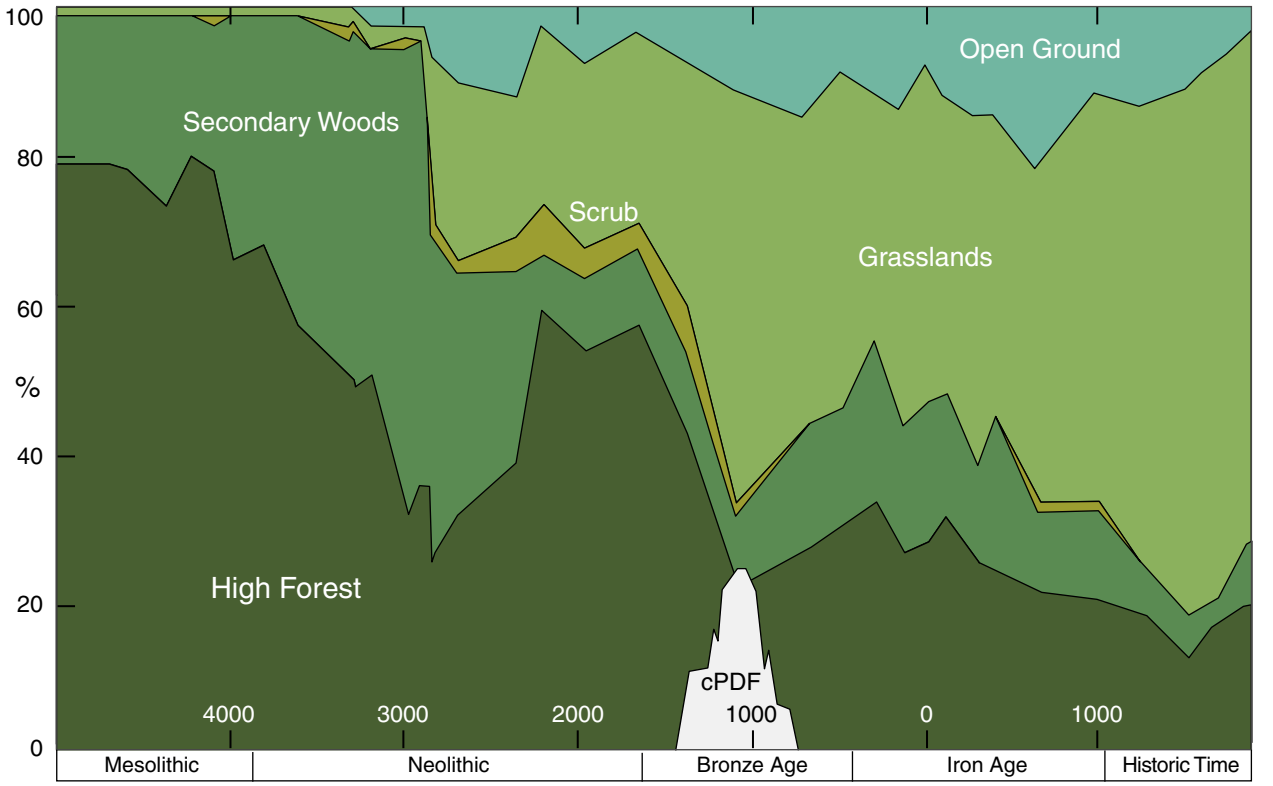



*Figure 2.11. Combination of cumulative probability density function (cPDF) of radiocarbon dates for Late Neolithic and Bronze Age houses from Thy (Olsen & Kanstrup this chap., fig. 2.C:f) with the regional pollen diagram from Hassing Huse Mose in central Thy (after Steinberg 1997). The peak in the cPDF curve precisely matches the peak in grassland pollen during the Bronze Age.*

Finnøy (fig. 2.12:3) (Hemdorff 1993), Frøyland, Time (fig. 2.12:13) (Bjørdal 2009), Kvåle, Time (fig. 2.12:14) (Soltvedt *et al.* 2007), Jåsund, Sola (fig. 2.12:6) (Fyllingen 2012) and Tjora, Sola (fig. 2.12:7) (Fyllingen & Armstrong 2012) (for an overview of two-aisled houses in Rogaland, see also Børsheim (2005) and Soltvedt *et al.* (2007)). Most of these houses are located in Jæren's central agricultural areas that, as the numerous burial sites from Early Bronze Age periods II and III clearly show, continued to be a core area for Bronze Age habitation in southwest Norway after period I (Møllerop 1963; Solberg 1994). However, as will be demonstrated below, the beginnings of a decline relative to former times are already apparent in the Early Bronze Age.

## The introduction of agriculture to Rogaland

There is now general agreement that an arable-pastoral economy was introduced in earnest to southwest Norway at the beginning of the Late Neolithic. This was associated with a marked southern Scandinavian (northern Jutish) Bell Beaker influence, probably carried to some degree by regular immigration (Solberg 1994; Prescott 1996, 2012). According to B. Solberg, bifacially flaked daggers of types I and II comprise 44% of the 755 flint daggers found to date in Rogaland (Solberg 1994, 114), showing that Late Neolithic I is well-represented in the area. This period coincides with a significant phase of woodland clearance that is apparent in the pollen data from Rogaland for the period 2500-2200 BC (Prøsch-Danielsen & Simonsen 2000; Høgestøl & Prøsch-Danielsen 2006). However, most of the many radiocarbon dates for the earliest houses in Rogaland (calibrated at 2 σ) fall later than 2200 BC and cannot therefore be linked to the above-mentioned woodland clearance phase at the beginning of the Late Neolithic.

This situation begs the question of whether it actually was a *combined* arable-pastoral package that was introduced at the beginning of the Late Neolithic and which, as proposed by C. Prescott (1996, 2005, 2012), swiftly led to major changes in society within the course of a single generation. There is much evidence to suggest a more gradual transition (cf. also Anfinset 2012, 235) and this is consistent with the woodland clearances at the beginning of the Late Neolithic being primarily seen as prompted by a desire to create more grazing land, combined with small-scale cereal cultivation (Prøsch-Danielsen &



BACK TO CONTENT

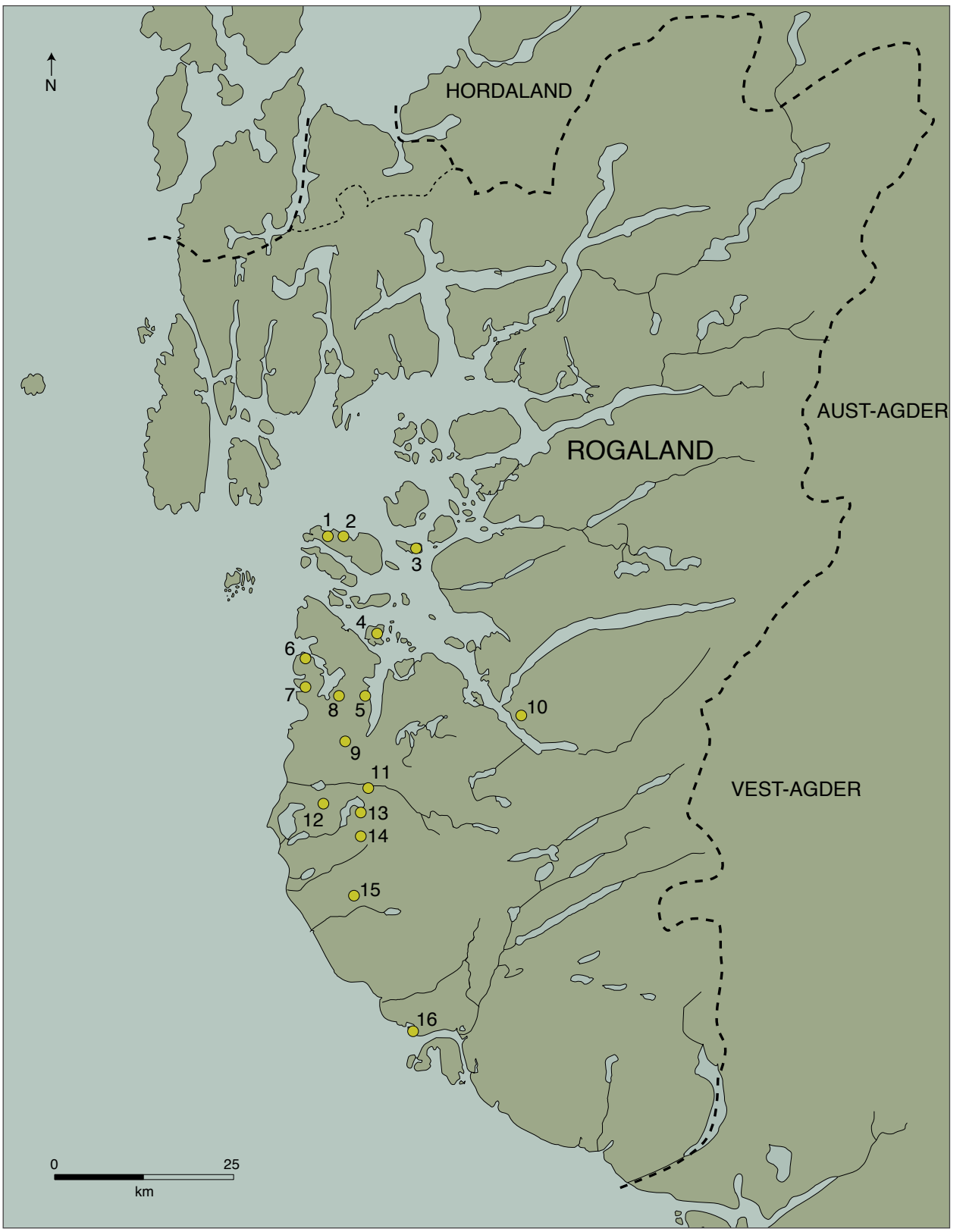
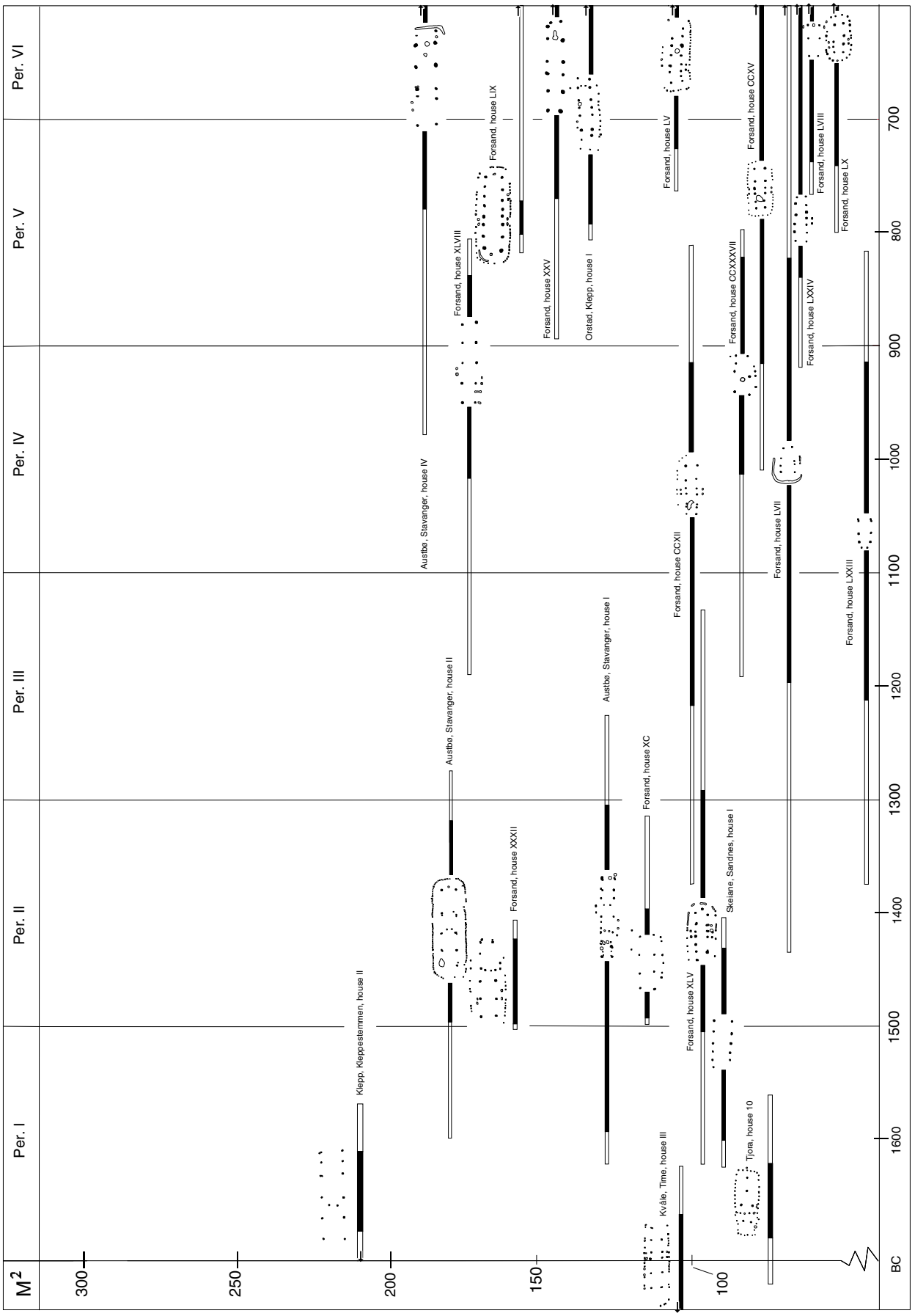



*Figure 2.12. Map of sites with radiocarbon-dated Late Neolithic and Bronze Age houses in Rogaland. 1) Voll, Rennesøy m., 2) Sørby, Rennesøy m., 3) Talgje, Finnøy m., 4) Skeie + Austbø, Stavanger m., 5) Gausel, Stavanger m., 6) Jåsund, Sola m., 7) Tjora, Sola m., 8) Røyneberg + Jåttå, Stavanger m., 9) Skeiane, Sandnes m., 10) Forsand, Forsand m., 11) Orstad, Klepp m., 12) Klepp, Klepp m., 13) Frøyland, Time m., 14) Kvåle, Time m., 15) Kvia, Hå m., 16) Hellvik, Eigersund m.*



BACK TO CONTENT






BACK TO CONTENT