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Expanding Horizons

Settlement Patterns and Outfield Land Use in the
Norse North Atlantic

Dawn Elise Mooney, Lísabet Guðmundsdóttir, Barbro Dahl,
Howell Roberts and Morten Ramstad (eds.)



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Editors of the series UBAS

Nils Anfinset

Randi Barndon

Knut Andreas Bergsvik

Søren Diinhoff

Lars L. Forsberg

Proofreading

Gwendolyne Knight Keimpema

Layout

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The wood artefacts on the left side are from Borgund, Norway while the artefacts on the right side are from Norse Greenlandic sites.

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List of authors

Irene Baug

Department of Archaeology, History, Cultural Studies and Religion,
University of Bergen (UiB),
P.O. Box 7805,
5020 Bergen, Norway
irene.baug@uib.no

Douglas J. Bolender

Fiske Center for Archaeological Research,
University of Massachusetts Boston,
100 Morrissey Blvd,
Boston, MA 02125, USA
douglas.bolender@umb.edu

Susanne Busengdal

Møre and Romsdal County Council,
Julsundvegen 9,
6412 Molde, Norway
susanne.iren.busengdal@mrfylke.nov

Kathryn A. Catlin

Department of Chemistry and Geosciences,
Jacksonville State University,
Martin Hall, 700 Pelham Road North,
Jacksonville, AL 36265, USA
kcatlin@jsu.edu

Writing of this article was carried out while the author was employed by the Institute at Brown for Environment and Society, Brown University, 85 Waterman St, Providence, RI 02912, USA

Barbro Dahl

Museum of Archaeology,
University of Stavanger (UiS),
4036 Stavanger, Norway
barbro.dabl@uis.no

Solveig Roti Dahl

Rogaland County Council,
Arkitekt Eckhoffsgate 1,
4010 Stavanger, Norway
solveig.roti.dahl@rogfk.no

Kristoffer Dahle

Møre and Romsdal County Council,
Julsundvegen 9,
6412 Molde, Norway
kristoffer.dable@mrfylke.no

Lísabet Guðmundsdóttir

Department of Archaeology,
University of Iceland,
Sæmundargata 2,
102 Reykjavík, Iceland
lisabetgud@gmail.com

Ramona Harrison

Department of Archaeology, History, Cultural Studies and Religion,
University of Bergen (UiB),
Postboks 7805,
5020 Bergen, Norway
ramona.harrison@uib.no

Kari Loe Hjelle

University Museum of Bergen,
University of Bergen (UiB),
Postboks 7800,
5020 Bergen, Norway
kari.hjelle@uib.no

Dawn Elise Mooney

Museum of Archaeology,
University of Stavanger (UiS),
4036 Stavanger, Norway
dawn.e.mooney@uis.no

Therese Nettet

University Museum of Bergen,
University of Bergen (UiB),
Postboks 7800,
5020 Bergen, Norway
therese.nettet@uib.no

Élie Pinta

Institut d'Art et d'Archéologie,
Université Paris 1 Panthéon-Sorbonne,
3 rue Michelet,
75006 Paris, France
elie.pinta@gmail.com

Lisbeth Prøsch-Danielsen

Museum of Archaeology,
University of Stavanger (UiS),
4036 Stavanger, Norway
lisbeth.prosch-danielsen@uis.no

Morten Ramstad

University Museum of Bergen,
University of Bergen (UiB),
Postboks 7800,
5020 Bergen, Norway
morten.ramstad@uib.no

Jennica Einebrant Svensson

Rogaland County Council,
Arkitekt Eckhoffsgate 1,
4010 Stavanger, Norway
jennica.einebrant.svensson@rogfk.no

Preface

This volume stems from the Expanding Horizons project, which began in 2018. The project was funded by a Workshop Grant from the Joint Committee for Nordic Research Councils in the Humanities and Social Sciences (NOS-HS), held by Orri Vésteinsson, Ramona Harrison, and Christian Koch Madsen. Funding was awarded for two workshops, as well as a subsequent publication of the material presented. Workshop organisation and grant administration were carried out by Morten Ramstad, Lísabet Guðmundsdóttir, Howell Roberts, Barbro Dahl, Birna Lárusdóttir, and Dawn Elise Mooney. The workshops gave researchers and practitioners from across the North Atlantic region an opportunity to forge new connections with each other, not only through academic presentations but also through shared experiences of archaeological sites, standing Medieval structures and their surrounding landscapes.

The first Expanding Horizons meeting took place in Norway, on June 1st–4th 2018. The program began in Bergen with a tour of the city's Medieval sites, led by Prof. Gitte Hansen, before travelling to Mo in Modalen for two days of presentations and discussions. The workshop was attended by 36 participants, 27 of whom gave presentations on topics including archaeological survey in mountain regions, driftwood, seaweed, stone, birds and feathers, and fishing and marine mammals. The two-day seminar was followed by an excursion visiting sites including the stave churches at Borgund, Hopperstad and Kaupanger, the Viking trading sites at Kaupanger and Lærdal, and Norway's oldest secular wooden building, Finnesloftet in Voss, built around AD 1300. In between archaeological sites, the excursion also took in the dramatic fjord landscape of western Norway. Here and in Iceland, both the upstanding structures and their surrounding landscape should be seen as key actors in the development of the settlement and subsistence practices discussed in this volume.

Just under a year later, on April 25th–28th 2019, the Expanding Horizons group met again in Iceland. Forty-one participants gathered in Brjónsstaðir for two more days of talks and discussions. While the first workshop had a main focus on remote wild resources, the second focused on settlement and land-use patterns, agricultural practices, and trade and exchange. Again, the workshop concluded with an excursion to local archaeological sites. Attendees visited the episcopal manor farm and church at Skálholt, the reconstructed Viking Age house at Stöng in Þjórsárdalur, the caves at Ægissíðuhellir, the archaeological site at the manor farm Oddi and the preserved medieval turf-built farm and museum at Keldur. Photographs of the participants of both workshops are presented on the following pages.

Partly due to the ongoing coronavirus pandemic, more time than anticipated has passed between these meetings and the publication of this volume. We thank the authors for their patience, and for their outstanding contributions to the archaeology of western Norway and the Norse North Atlantic diaspora. We are also very grateful to our colleagues who assisted the editors in the peer review of this volume. Lastly, we thank you, the reader, and we hope that you find inspiration in the papers presented here.

Stavanger/Reykjavík/Bergen, Spring 2022

Dawn Elise Mooney, Lísabet Guðmundsdóttir, Barbro Dahl, Howell Roberts and Morten Ramstad



Attendees of the first Expanding Horizons workshop at Mo in Modalen, June 2018.

Back row, left to right: Jennica Einebrant Svensson, Garðar Guðmundsson, Even Bjørdal, Orri Vésteinsson, Morten Ramstad, Jørgen Rosvold, James Barrett, Gísli Pálsson, Michael Nielsen, Christian Koch Madsen, Konrad Smiarowski, Howell Magnus Roberts, Ragnar Orten Lie; Middle row, left to right: Solveig Roti Dahl, Brita Hope, Ragnheiður Gló Gylfadóttir, Kristoffer Dahle, Douglas Bolender, Hákan Petersson; Front row, left to right: Mjöll Snæsadóttir, Birna Lárusdóttir, Lilja Laufey Davíðsdóttir, Irene Baug, Kristin Ilves, Jørn Henriksen, Kathryn Catlin, Lilja Björk Pálsdóttir, Gitte Hansen, Kristborg Þórsdóttir, Élie Pinta, Dawn Elise Mooney, Lisabet Guðmundsdóttir, Sólveig Guðmundsdóttir Beck, Ramona Harrison. *Photo: Kathryn Catlin.*



Attendees of the second Expanding Horizons workshop at Brjánsstaðir, April 2019.

Back row, left to right: Howell Magnus Roberts, Morten Ramstad, Kjetil Loftsgarden, Kristoffer Dahle, Douglas Bolender, Ragnheiður Gló Gylfadóttir, Hildur Gestsdóttir, Michael Nielsen, Orri Vésteinsson, Jennica Einebrant Svensson, Trond Meling, Knut Paasche, Anja Roth Niemi, Knut Andreas Bergsvik, Simun Arge; Middle row, left to right: Guðrún Alda Gísladóttir, Brita Hope, Hákan Petersson, Kathryn Catlin, Even Bjørdal, Ragnheiður Traustadóttir, Élie Pinta, Solveig Roti Dahl, Per Christian Underhaug; Front row, left to right: Kristborg Þórsdóttir, Sólveig Guðmundsdóttir Beck, Guðmundur Ólafsson, Gitte Hansen, Mjöll Snæsadóttir, Lisbeth Prösch-Danielsen, Kari Loe Hjelle, Irene Baug, Christian Koch Madsen, Ramona Harrison, Barbro Dahl, Dawn Elise Mooney, Thomas Birch, Lisabet Guðmundsdóttir, Jørn Henriksen. *Photo: Lisabet Guðmundsdóttir.*



Therese Nasset and Kari Loe Hjelle

Settlement and subsistence strategies in western Norway: examples from two deserted medieval farms

Two deserted medieval farms are investigated: the coastal Høyboen farm, located on an island on the western coast of Norway, and the inland Hellaug farm located in an upland but low-lying mountain valley. Both farms were settled during the Viking Age and abandoned during the Late Middle Ages. Abandoned Medieval farms have traditionally been perceived as less well-off than central contemporary farms. They have often been characterized as marginal, especially with regard to agrarian conditions. However, little is known about their subsistence strategies and whether they were sustainably farmed for several hundred years before they were abandoned. This paper discusses social aspects of farm establishment, the settlement basis, and land-use practices at the Høyboen and Hellaug farms by using archaeological and botanical sources. Both farms were settled during a time when the areas became more intensively used by neighboring farms. The farms were likely subordinated to a main farm and the people working the newly established farms were tenants. The subsistence strategies were based on the infield-outfield system, but the economic basis of both farms mainly came from outland resources where available pastures were especially important. The combined source material shows that the farms participated in different cultural and economic networks.

Introduction

During the Viking Age and early Middle Ages (for dates, see Table 1) the character of Norse rural settlement developed and expanded both domestically and abroad. In addition to the *landnám* to the west, it was a period with different types of farm formation, organization, and reorganization of resource areas, farms, and estates in Norway (Øye 2009a). Often, new farms were cleared in land that was available, but less suitable, for agrarian purposes. During the late Middle Ages, many farms became abandoned (Sandnes and Salvesen 1978, Lunden 2004) and some were never settled again. Deserted medieval farms located on the periphery of the more established rural community have been characterized as dispersed single farm units with poor conditions for sustainable land use (Zehetner 2007, Øye 2009a). During the 20th century such areas also lost their economic and social importance with the introduction of modern and industrialized agriculture. This has enhanced the modern perception of outland areas (the term outfield is also used - Norwegian *utmark*) as marginal and peripheral, potentially biasing research into earlier rural settlements, as has been highlighted by different studies (e.g. Kaland 1979, Svensson 2007, 2015). Further, it has been pointed out that the general idea of isolated settlements in the north is problematic, and often serves as an obstacle to understanding local and regional variations in settlement patterns (see Vésteinsson 2006).

Archaeological research on deserted Medieval farms has stressed the importance of considering the settlement conditions and the cultural and socioeconomic context they were part of (e.g. Martens 1988, Svensson 2007, Stene and Wangen 2017). For instance, many Medieval farms in upland and forested areas of Scandinavia had an economy connected to surplus production of resources such as hunting and iron production. These activities had high economic importance, decisive for the farms' abilities to take part in cultural and social trends (Martens 1988, 1998, Svensson 2007, Stene and Wangen 2017). However, hunting and iron production were not activities resulting in the mass production of highly demanded goods in the western part of Norway. Little is known about the basis for life at the peripheral and relatively short-lived farms in this region. The natural topographical conditions here are different from the inland and eastern part of Norway, probably resulting in a different settlement basis and social conditions during the Viking Age and Early Middle Ages.

Table 1. Time periods mentioned in the paper.

Period	Abbreviation	Year AD
Late Iron Age:	LIA	570-1030
Merovingian Period	MP	570-800
Viking Age	VA	800-1030
Middle Ages:	MA	1030-1537
Early Middle Ages	EMA	1030-1150
High Middle Ages	HMA	1150-1350
Late Middle Age	LMA	1350-1537

Here, we present two deserted Medieval farms from western Norway, and the social and economic aspects of their settlement and subsistence strategies are discussed from a long-term perspective. The farms were settled during the late Iron Age and abandoned during the late Middle Ages. The site of the Høybøen farm is located by the outer coast while the Hellaug farm is in a small mountain valley. After abandonment, the sites have been used as outland areas by nearby farms for grazing and haymaking. Because of this, archaeological and botanical remains from the two farms have been well preserved compared to farms that have been in use until present. The Høybøen and Hellaug farms therefore represent highly important sites to investigate settlement basis and farming practices in two different geographical settings.

The primary sources in this paper are archaeological and botanical data from the Høybøen and Hellaug sites, from contexts dated to the beginning of the late Iron Age until the late Middle Ages. In addition, archaeological data in - and from - the farms' surrounding outland areas are studied and compared to earlier palynological studies. The following research questions are addressed:

- What kind of resource exploitation and land-use practices can be recognized before the establishment of the Medieval farms?
- What was the social and cultural position of the Høybøen and Hellaug farms?
- What were the farming strategies and how were they related to natural resources?

The sites

The sites represent different geographical and topographical settings with different climate and vegetation, and therefore have strongly different potential for agrarian output. This is essential when considering both land-use practices from a long-term perspective and subsistence strategies at the Medieval farms.

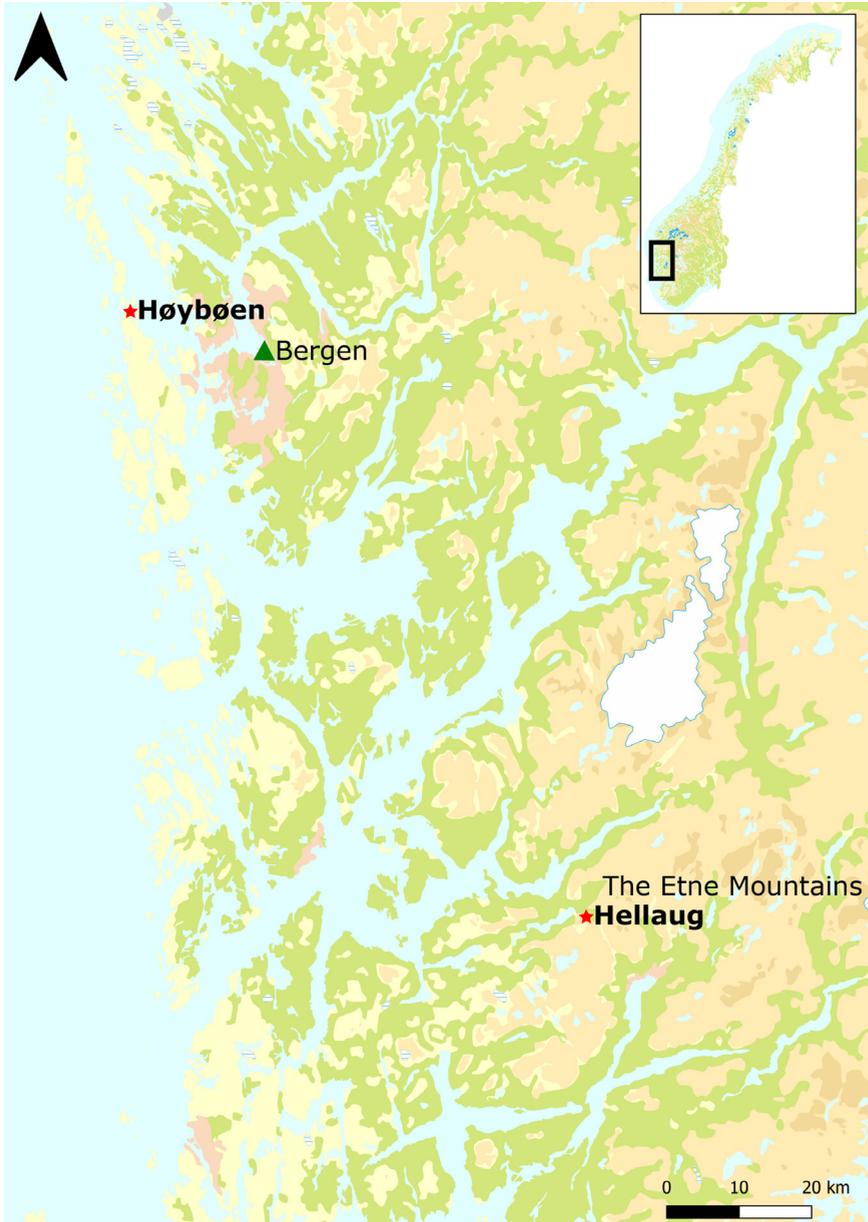


Figure 1. The location of Høybøen and Hellaug in Western Norway.

Høybøen

Høybøen is located by the outer coast on the Vindenes Peninsula. The Medieval farm was connected to the sailing route to Bergen (Figure 1), Norway's largest city and trade port in the Middle Ages. The landscape at Høybøen is characterized by bedrock, heathlands, scattered forested areas, and mires. The climate is oceanic with strong winds, cool summers, and mild winters. The mild climate makes it possible for year-round grazing for suitable breeds of sheep and cattle because of the winter-green *Calluna vulgaris* (heather).



Figure 2. The ruins from the coastal Medieval Høybøen farm lie close to a small bay that connected the farm to the sea. Photo: Therese Nesset.

Høybøen (Figure 2) is today part of the outland area of the farm Vindenes. The infield area consists of two terraces of south-facing slopes with old, cultivated fields. The resource area outside of the infields stretches north from a small mountain between Høybøen and Vindenes and includes the northern part of the peninsula (Randers 1981a). The distance between Vindenes and Høybøen is c. 2.3 km.

Hellaug

Hellaug (Figure 3) is located in a small low-lying mountain valley (275 m above sea level) in the Etne mountains, in the southernmost part of Vestland County, 90 km from Høybøen. Here, the landscape is typical of the inner fjords, with warmer summers and cooler winters than at Høybøen. The climatic conditions at Hellaug are almost the same as at lower elevations but with longer and colder winters. Today, the vegetation at Hellaug and the nearby areas consists of partly open grasslands and mixed forests. The surrounding mountain areas have been used for grazing and summer farming until the present.



Figure 3. The open area by the lake is the Medieval infield area of Hellaug. Photo: Therese Nesset.

In recent times, Hellaug has been a shieling site and is part of the Vinja farm's outland area. The remains of the medieval farmyard and infield at Hellaug are located on a west-facing, partly rolling slope towards the lake. The distance between Vinja and Hellaug is c. 2.6 km. The outland resource area of the medieval Hellaug farm is considered to have been the mountain areas east of Hellaug connected to the watercourse Hellaugvassdraget which contains lake Hellaug.

Materials and methods

Excavations and sampling

The primary archaeological and botanical source material from Høybøen and the surrounding areas stems from archaeological excavations on the Vindenes Peninsula during 1977 and 1978 (Berge 1978a, 1978b, Ågotnes 1978, Randers 1981a, 1981b). Figure 4 is based on the results of the excavation (Randers 1981a), and shows the visible structures and trenches where samples were taken for pollen analysis and radiocarbon dating. The two main buildings and a boat house were excavated, and the infield area was investigated by surveys, documentation of visible structures, and digging of trenches in old fields. Also, three grave mounds from an Early Iron Age farm at Høybøen, abandoned c. AD 400, were excavated. The buildings were excavated using mechanical layers and levelling of artefact contexts (Randers 1981a). Sediment and peat cores were taken from lake Herøyvatn and a bog west of Herøyvatn (Figure 4) for palynological studies (Berge 1978a, 1978b, Mehl *et al.* 2015).

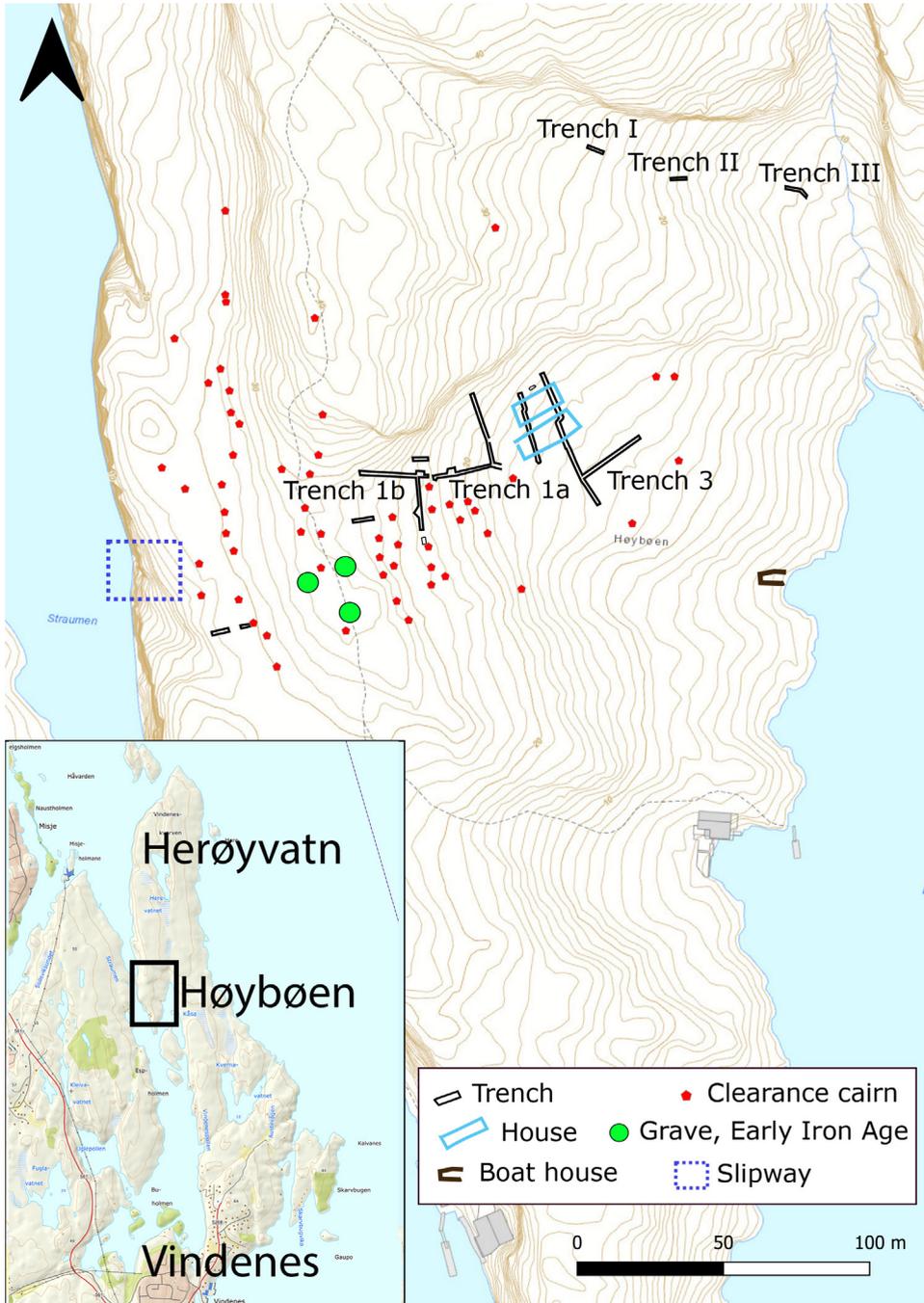


Figure 4. The infield of Høybøen with visible structures and trenches where pollen samples were taken, including a map of the outfield area with sites mentioned in the paper.

The primary source material from Hellaug and the surrounding areas stems from several investigations. One of the two house-remains (house 1, Figure 5) at the medieval farmyard was excavated as early as in 1929 and 1932 (Lindøe 1932), using mechanical layers in a grid system of 1 x 1 m. In 2012 field structures surrounding the farmyard at Hellaug were documented (Nesset 2013). Figure 5 is based on an archaeological investigation in 2012 and shows the visible structures as well as trenches where samples were taken from soil profiles for pollen analysis and radiocarbon dating. Together, the farmyard and infield consist of two buildings, two cattle lanes, several clearance cairns, and a stone fence surrounding the infield. Trenches and test-excavations were dug in the infield to document cultivation layers.

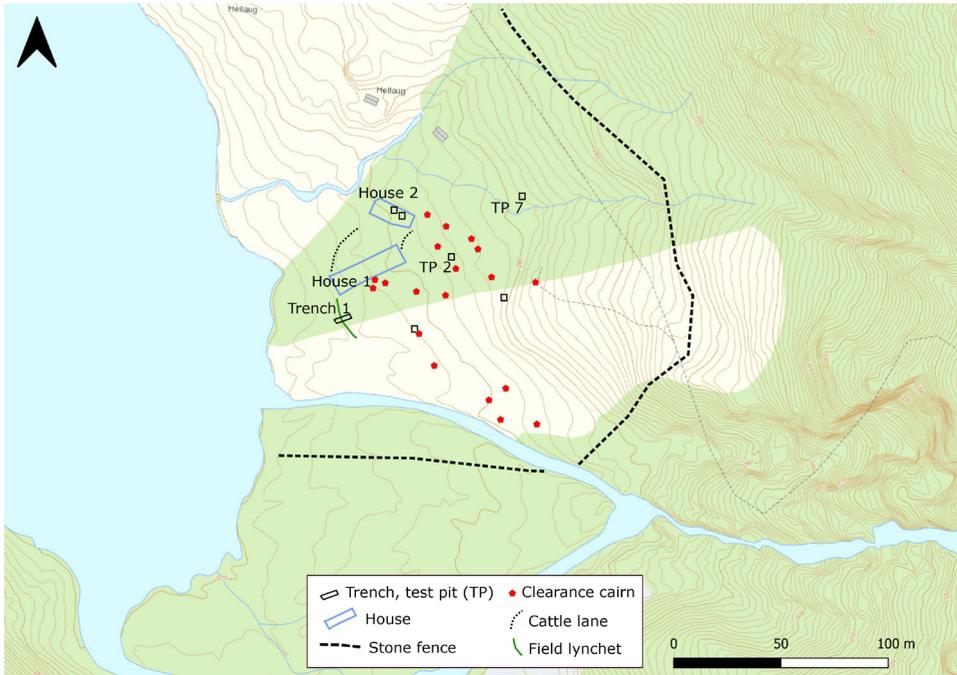


Figure 5. The infield of Hellaug with documented cultural heritage monuments, visible structures, and trenches from which pollen samples were taken.

In the 1980s, archaeological surveys and palynological investigations were conducted in the mountain area surrounding Hellaug, including areas connected to Hellaugvassdraget (Martinussen and Myhre 1985, Kvamme 1985, 1988). As part of a PhD-project, cultural heritage monuments connected to Hellaugvassdraget were re-documented, mapped, and several rock shelters, stone fences, charcoal pits, a reindeer pit, and hunting posts (Figure 6) were examined with archaeological test-excavations (Nesset 2015).

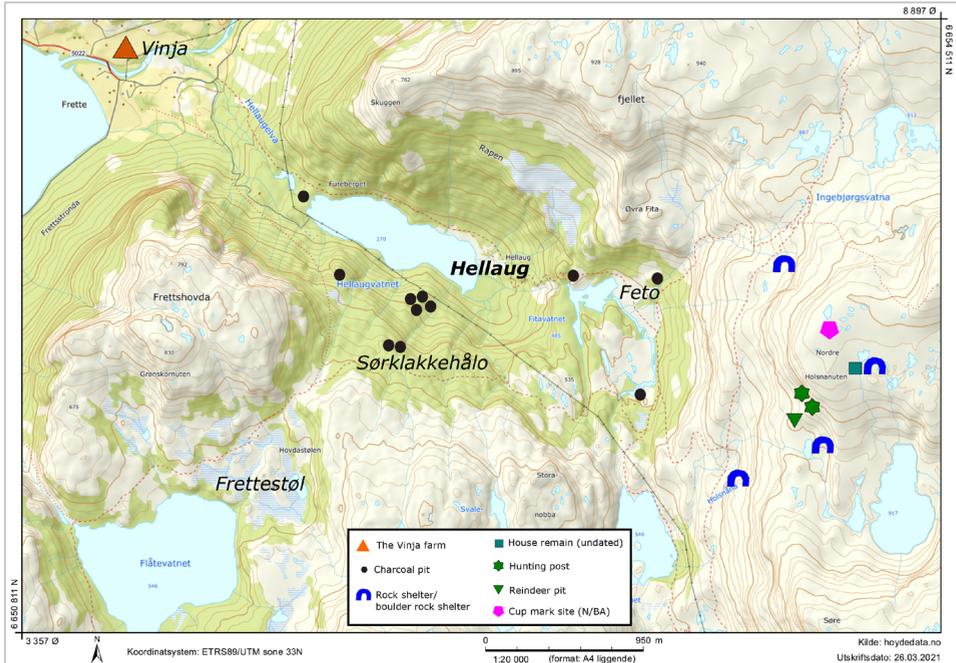


Figure 6. The sites and cultural heritage monuments in Hellaugvassdraget mentioned in the paper.

Archaeology

Here, the criterion for permanent settlement at the farms is the presence of physical structures of graves or buildings from the first settlement phase in the farmyard, and/or thicker cultivation layers indicating intensified farming and evidence of a complex farming system (crop cultivation, grazing, haymaking) in the pollen diagrams.

Because of the different methods applied at the two sites, it has been important to re-document and re-analyze the archaeological material to make the sites comparable. The structural remains have been identified and mapped and show the farms' physical organization, which in turn indicates farming strategies. All ^{14}C dates presented in the paper have been re-calibrated using OxCal v4.3.2 software (Bronk Ramsey 2017), and are presented in table 1 for Høybøen and table 2 for Hellaug.

Artefacts have been studied using the same typological references. Basic identification of object type, the raw material, and, when possible, the objects' provenance have been studied to consider the farms' social and cultural positions. Here, all finds from the farmhouses, farmyards, and infield areas broadly dated to when the medieval farms were settled have been included. The identified objects are presented in table 4 for Høybøen and table 5 for Hellaug. The function of the objects has been interpreted based on methods applied on artefact assemblages from urban Norwegian contexts (Nordeide 1989, Ulriksen 1996, Hansen 2005) but modified to better suit rural contexts.

Pollen analysis

At Hellaug, pollen samples from one soil profile (Figure 7) have been analysed. In the laboratory, 1 cm³ samples were taken from the original samples and processed following the methods described in Fægri *et al.* (1989) with KOH, acetolysis, and HF treatment. Fuchsin was added and the samples mounted in glycerol. Analysis was done using a Zeiss Imager. M2 microscope with phase contrast and 63x magnification. Identification is based on keys in Fægri *et al.* (1989) and Beug (2004), as well as the modern reference collection at the University of Bergen. The nomenclature follows Lid and Lid (2005), and identification of non-pollen palynomorphs (NPPs) follows van Geel *et al.* (2003). The results are shown as percentages of the sum of total terrestrial pollen. Percentages of spores, NPPs, and charcoal are calculated based on the pollen sum + the sum of the microfossil group in question.

Pollen data from Høybøen were extracted from the investigation carried out by Jan Berge in 1977 and 1978 (data in the palaeobotanical collections, University Museum, University of Bergen, Berge 1978a, 1978b). For comparison, open-land taxa in samples from layers dated to the Middle Ages in the infield of Hellaug and Høybøen are shown. The pollen taxa are grouped into pastures and meadows, cultivated fields, heathlands, other open-land taxa, and unidentified.

Results

Structural remains

The ¹⁴C dates (Table 2) aligned to the late Iron Age/early Middle Ages are from physical structures that represent an older settlement phase at Høybøen, providing a *terminus ante quem* for the establishment of the farm (Randers 1981a).

At Hellaug, there is no archaeological evidence from the farmyard older than the High Middle Ages: the ¹⁴C date from the bottom floor layer in house 2 (Table 3). The earliest traces of agrarian activity in the infield are clearance layers (layers 4 and 6; Figure 7) ¹⁴C-dated to the Merovingian Period/Viking Age. A thicker cultivated soil layer in the trench (layer 2; Figure 7) dated to the Viking Age/early Middle Ages indicates intensively worked fields. This suggests a permanent farming settlement at the site.

Table 2. Radiocarbon dates from Høybøen and Herøyvatn, including context interpretation. Dating is carried out by NTNU Trondheim, Norway and Beta Analytic Inc., USA.

Lab. No.	Context	Material dated	Conventional Radiocarbon Age	Calibrated date, 2 sigma (95,4 %)	Period	Context interpretation
Høybøen (farmyard, infield):						
T-3263	House 2b, layer 4	Charcoal	1070 ± 70	773-1156 calAD	MP, VP, EMA	Charcoal layer, possible part of burnt-down wall (Randers 1981a)
T-3262	House 2a, layer 5	Charcoal	1070 ± 60	774-1151 calAD	MP, VP, EMA	Charcoal layer under southern wall (Randers 1981a)
T-3683	Between room 2a and 2b, house 2, layer 3	Peat	1050 ± 70	775-1161 calAD	MP, VP, EMA	Phase of abandonment with re-forestation (Berge 1978)

T-2762	Trench 6, 'upper charcoal layer'	Charcoal	1000 ± 70	893-1211 calAD	VP, EMA, HMA	Field. Clearance layer (Randers 1981a; Berge 1978)
T-3264	House 2b, corner fireplace	Charcoal	880 ± 60	1037-1263 calAD	EMA, HMA	Charcoal found in fireplace (burnt firewood) (Randers 1981a)
T-3063	House 1c, under floor pavement	Charcoal	810 ± 70	1041-1299 calAD	EMA, HMA	Possible fill (waste) under floor pavement (Randers 1981a)
T-3061	Boat house, layer 4	Bark/ Birch bark (Betula)	770 ± 60	1054-1388 calAD	EMA, HMA	Floor layer (Randers 1981a)
T-3684 B	Storåkeren, Trench III, lower part of layer 1b	Peat	610 ± 80	1270-1442 calAD	HMA, LMA	Layer from abandonment. Re-growth and water logging (Berge 1978)
T-3682 B	Trench 3, lower part of layer 2	Peat	600 ± 60	1285-1425 calAD	HMA, LMA	Layer from abandonment. Re-growth and water logging (Berge 1978)
Herøyvatn (close outland):						
Beta-346689	Core sample, from lake, 642-643 cm depth	Plant remains	1410 ± 30	597-664 calAD	MP	(Mehl et al. 2015)

Table 3. Radiocarbon dates from Hellaug, Sørklakkehålo, Feto and Frettestøl, including context interpretation. Dating is carried out by Beta Analytic Inc., USA and NTNU Trondheim, Norway.

Lab. No	Context	Material dated	Conventional Radiocarbon Age	Calibrated date, 2 sigma (95,4 %)	Period	Context interpretation
Hellaug (farmyard, infield):						
Beta-332448	Trench 1, layer 4	Charcoal (Betula)	1220 ± 30	687-888 calAD	MP, VA	Field lynchet. Clearance layer (Nasset 2013)
Beta-332447	Trench 1, layer 6	Charcoal (Betula)	1200 ± 30	706-945 calAD	MP, VA	Field lynchet. Clearance layer (Nasset 2013)
Beta-332446	Trench 1, layer 3	Charcoal (Betula)	1190 ± 30	709-952 calAD	MP, VA	Field lynchet. Cultivation layer, grazing (Nasset 2013)
Beta-331297	TP 7, layer 2	Charcoal (Betula)	1180 ± 30	771-973 calAD	MP, VA	Field/meadow. Cultivation layer (Nasset 2013)
Beta-332443	TP 2, layer 4 (bottom)	Charcoal (Betula)	1140 ± 30	774-992 calAD	MP, VA	Field. Cultivation layer (Nasset 2013)
Beta-331298	TP 7, layer 3	Charcoal (Betula)	1110 ± 30	882-1015 calAD	VA	Field/meadow. Cultivation layer (Nasset 2013)

Beta-332445	Trench 1, layer 2 (bottom)	Charcoal (Betula)	1040 ± 30	896-1114 calAD	VA, EMA	Field lynchet. Cultivation layer, crop cultivation (Nesset 2013)
Beta-331294	TP 2, layer 3	Charcoal (Betula)	970 ± 30	1022-1159 calAD	EMA	Field. Cultivation layer (Nesset 2013)
Beta-331293	TP 2, layer 2	Charcoal (Betula)	810 ± 30	1178-1276 calAD	HMA	Field. Cultivation layer (Nesset 2013)
Beta-331296	House 2, layer 3	Charcoal (Betula)	730 ± 30	1229-1378 calAD	HMA, LMA	Floor layer, farmhouse (Nesset 2013)
Beta-332444	Trench 1, layer 2 (top)	Charcoal (Betula)	680 ± 30	1276-1390 calAD	HMA, LMA	Field lynchet. Cultivation layer, crop cultivation (Nesset 2013)
Beta-331295	House 2, layer 2	Charcoal (Betula)	480 ± 30	1407-1456 calAD	LMA	Floor layer, farmhouse (Nesset 2013)
Sørklakkehålo (close outland):						
Beta-401655	S5, TP3, layer 4	Charcoal (Betula)	970 ± 30 BP	1022-1159 calAD	EMA	Charcoal pit. Charcoal layer (Nesset 2015)
Beta-401656	S2, TP 2, layer 2	Charcoal (Betula)	900 ± 30 BP	1042-1219 calAD	EMA, HMA	Charcoal pit. Charcoal layer (Nesset 2015)
Feto (shieling site):						
Beta-401652	S10, TP 5, layer 2	Charcoal (Betula)	1000 ± 30 BP	992-1154 calAD	VA, EMA	Charcoal pit. Charcoal layer (Nesset 2015)
Beta-401651	S8, TP 4, layer 5	Charcoal (Betula)	880 ± 30 BP	1045-1228 calAD	EMA, HMA	Charcoal pit. Charcoal layer (Nesset 2015)
Frettestøl (shieling site):						
T-5560	Core sample from bog, layer 2	Peat	930 ± 80	989-1269 calAD	VA, EMA, HMA	Introduction of intensive shieling activities (Kvamme 1985, 1988)

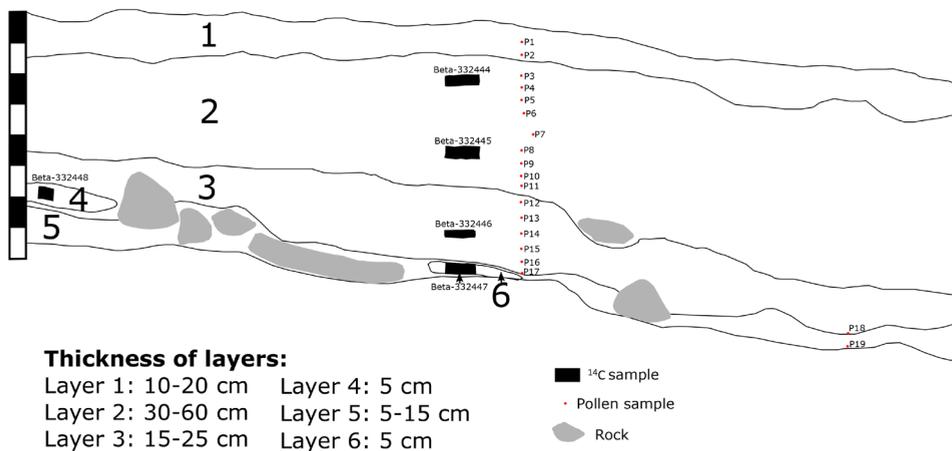


Figure 7. Profile from a field lynchet (trench 1, Figure 5) showing the thickness of agricultural layers and position of the radiocarbon-dated samples and pollen samples.

The structural remains documented and mapped in Figures 4 and 5 at Høybøen and Hellaug represent the last settlement phases at the sites. Based on pottery dated typologically and on ¹⁴C dates, the *terminus post quem* of abandonment at Høybøen is c. AD 1350-1400 (Randers 1981a). The *terminus post quem* of abandonment at Hellaug is c. 1450, based on the ¹⁴C date of the top floor layer in house 2. The estimated size of the area of cultivated fields at Høybøen at this time was between 3 and 7 decares with at least 3 decares intensively farmed (Randers 1981a). At Hellaug, the total area of intensively cultivated fields has been estimated to be at least 2.5 decares, based on documentation of cultural layers in the infield (Nesset 2013) and the distribution of clearance cairns.

Figure 6 shows the distribution of documented cultural heritage monuments in the outland area of the Hellaug farm. In the close outland south of lake Hellaug and at the shieling site Feto, several charcoal pits have been dated to the Early and High Middle Ages (Table 3). The physical connection and chronological similarity between these sites and Hellaug suggest that the activity was connected to the farm.

Further east at higher elevations there are rock shelters with traces of human activity from prehistoric and early historic times (Nesset 2015). A cup-mark site also shows that these mountain areas were in use in prehistory. As seen in Figure 6 the rock shelters and cup-mark site are located close to pastures on mountain plateaus in addition to hunting posts and a reindeer pit.

Artefact assemblage

Tables 4 and 5 show the results of the analysis of the artefacts from the farms. The interpreted objects are listed in the table according to their function. The find frequency differs between the farms: Høybøen has a higher number of total finds, but the objects from both farms represent a range of consumables for different tasks of everyday life in Medieval rural households in western Norway. In addition, several fishing tools were found at Høybøen.

Table 4. *Artifact assemblage from Høybøen.*

Artifact assemblage from the Høybøen farm (from house 1, 2 and stray finds from farmyard)	
Tools: agriculture and domestic animals	3 scythes (iron), 3 nails from horseshoes (iron)
Tools: fishing	9 fishhooks (iron), 1 trident (iron) 15 line sinkers (soapstone), 7 net sinkers (soapstone), 1 anchor stone for net (soapstone)
Tools: crafting	3 knives (iron), 3 scissors (iron), 5 pumice stones, 1 rotating whetstone (red sandstone), 39 hones (most light grey schist, dark fine-grained schist, and some of sandstone), 25 spindle whorls (most soapstone, lead), 68 loom weights (soapstone)
Waste: crafting	Ca. 10 kg. soapstone waste and blanks, ca. 8 kg. of iron slag
Food preparation, storing and serving	59 soapstone vessels and 2 iron handles from soapstone vessels, 36 cooking pots (pottery), 30 tableware (pottery), 20 kg of bakestone fragments (most schist, some soapstone), 1 quernstone (schist), 273 pieces of flint
Personal equipment	2 combs (antler, bronze), 1 belt-buckle (bronze), 2 lead weights, 2 small salve pots (pottery)
Micellaneous: various equipment, part of buildings, moveables	3 lamps (soapstone), 2 locks (iron), 3 keys (iron), 1 handle (iron), 6 fittings (iron), 3 fittings (bronze), 1 chain (iron), 1 hinge (iron), 5 plugs (wood), ca. 170 pieces of rivets and nails (iron), 20 unidentified fragments (iron)

Table 5. Artifact assemblage from Hellaug.

Artifact assemblage from the Hellaug farm (from house 1, stray finds from farmyard)	
Tools: agriculture and domestic animals	1 scythe (iron), 1 horseshoe (iron)
Tools: crafting	11 hones (light grey schist), 1 spindle whorl (soapstone), 5 loom weights (soapstone)
Waste: crafting	Ca. 100 g. of iron slag, ca. 20 g. bloomery slag
Food preparation, storing and serving	5 soapstone vessels, 3 kg of bakestone fragments (schist), 1 quernstone (schist), 13 pieces of flint
Personal equipment	1 amulet with runes (lead)
Micellaneous: various equipment, part of buildings, moveables	Rivets and nails (iron), 1 ring (iron), 1 fitting (iron)

Pollen data

The pollen diagram from the infield at Hellaug reflects the field lynchet and the different agricultural layers exposed in Trench 1 (Figures 5 and 7). All samples are characterized by high values of open-land taxa (Figure 8). The diagram is divided into four local pollen zones.

Pollen zone 1 (layer 6 and the lower part of layer 3; Merovingian Period/Viking Age) has the highest percentages of tree pollen in the diagram (12–18% of the pollen sum), dominated by *Alnus* (alder). Poaceae (grasses, up to 60%), *Rumex acetosa* (sorrel), *Ranunculus acris* (buttercup), and *Silene dioica* (red campion) have high values, and *Plantago lanceolata* (ribwort plantain) is continuously present, reflecting an open herb-rich and grass-dominated vegetation at the site. Polypodiaceae (fern spores) and charcoal have high values. This shows presence of people and grazing in the area, but also the existence of fern dominated vegetation without trampling from grazing animals.

Pollen zone 2 (upper part of layer 3; Merovingian Period/Viking Age) still has relatively high values of *Alnus*, Poaceae contributes around 60%, and the same herbs are present as in zone 1. This indicates the continuous dominance of grass-dominated vegetation, while the presence of *Salix* (willow), Cyperaceae (sedges), and *Filipendula* (meadowsweet) may indicate humid conditions in the vicinity. Some arable weeds, such as *Spergula arvensis* (corn spurrey) and *Persicaria maculosa* (lady's thumb) are sporadically present and may indicate that cereal cultivation also took place in the area. Both fern spores and charcoal values are high.

Pollen zone 3 (layer 2; late Viking Age/early Middle Ages) is characterized by less than 10% tree pollen, a decrease in fern spores, and high values of grassland taxa. Also, cereals (*Hordeum* (barley)) and arable weeds such as *Galeopsis* (hemp-nettle) and *Spergula arvensis* obtain high values. Cereal cultivation most probably took place locally. The presence of coprophilous fungal spores with high values of *Sordaria* HdV55 and sporadic occurrences of *Podospora* HdV368 (van Geel *et al.* 2003), indicates grazing or manuring of the fields. A high diversity of grassland species, including *Achillea*-type (yarrows), *Campanula* (harebell), *Trifolium pratense* (red clover), and *Plantago lanceolata*, indicates mowing in addition to grazing (cf. Hjelle 1999). The field was probably surrounded by hay meadows or an oscillation between cultivation and hay production took place, in which the area could have been grazed seasonally.

Pollen zone 4 (layer 1; recent time) has high values of grasses and meadow species, whereas cereals and arable weeds are nearly absent. The zone reflects grazing at Hellaug after abandonment of the farm.

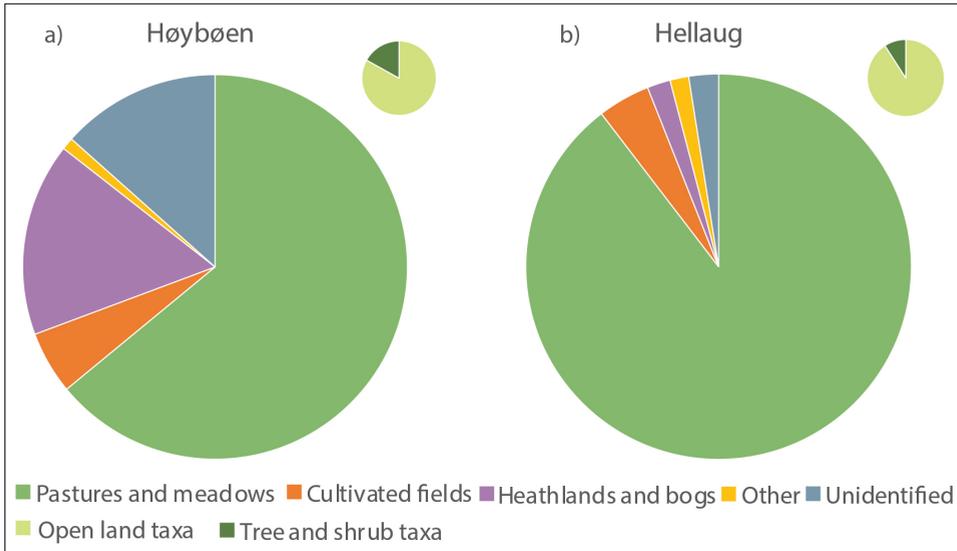


Figure 9. Pollen samples representing agricultural layers from the period of farm settlement in the Early Middle Ages at Hellaug and Høybøen.

Discussion

Social aspects of farm establishment

Prior to the Late Iron Age, human activity in the surrounding areas of Høybøen and Hellaug was mainly based on use of the natural resources available in the respective areas: hunting and fishing, which gradually became supplemented with extensive grazing, first along the coast and later in the mountain areas (Berge 1978a, 1978b, Randers 1981a, Ågotnes 1981, Kvamme 1985, Martinussen and Myhre 1985, Mehl *et al.* 2015, Nettet 2015). Apart from a period during the Early Iron Age when there was permanent agrarian settlement at Høybøen (Randers 1981a), the human settlement in both areas was seasonal.

There is no archaeological nor botanical evidence of permanent settlement at Høybøen or Hellaug from the earliest part of the Late Iron Age. The botanical sources reflect, however, a development in the agrarian economy, where nearby farms probably started to use the outlying areas of their local territory more intensively. This suggests an increased agrarian economic importance of the areas and thus an increased presence of both humans and grazing animals, reflecting a general trend in the agrarian development at the time. In this period, the farming economy, focusing on animal husbandry, was intensified in most areas of western Norway, thus changing the economic - and consequently the social - importance of outland areas (Kvamme 1988, Bjørge *et al.* 1992, Overland and Hjelle 2009, Hjelle *et al.* 2012, 2018, Hope 2015).

The farms seem to have been permanently settled after a period of intensification of grazing activities in the areas from the Merovingian Period at the latest. Similar tendencies have also been observed in pollen diagrams from several sites in southern Sweden, where farms were settled during the late Iron Age after an initial period of increased seasonal land use (Lagerås

2007). The increased human activity prior to permanent settlement at both Høybøen and Hellaug clearly indicates a continuation of use, probably connected to an increased economic importance in this period. Who, then, would settle here?

Individual colonists were rewarded with tax relief and partial ownership of, and reduced farm rent from, farms cleared in the commons (Norwegian *allmenninger*) (Øye 2009b). According to the early provincial medieval law for western Norway, *Gulatingslova*, when a farm was cleared within this area, what is considered the core area of the newly established farm was legally the king's farm (G 145 in Robberstad 1981), and thus the colonists were the king's tenants. This would also lead to the loss of usage rights for the people that had used these areas prior to the permanent settlements, resulting in a great economic disadvantage for them.

However, *Gulatingslova* (G 86 in Robberstad 1981) and the National Code, *Landslova* of 1274 (L 61 in Taranger 1970), also state that an area considered to be the commons could legally be part of a farm's resource area if they had a right to its use: if the land had been used by a farm for a given period (the *Gulatingslova* states more than 20 winters and *Landslova* states more than 60 winters), the area would become the property of the user. For instance, an area used for shieling, or plots used for grazing or hay-making (Norwegian *markateig* or *teig*) could be claimed as legally part of a farm. This could mean that farms established in such areas were considered the property of the main farm that had the rights to use. Based on the pollen data and ¹⁴C dates from the infield at Hellaug, and the lake Herøyvatn close to Høybøen (Mehl *et al.* 2015), it is likely that the two areas had been used for seasonal agrarian activities, and at the coast also whole-year grazing, for more than 60 years prior to the establishment of the farms.

The property rights of the Høybøen and Hellaug farms are thus important to consider, especially in relation to the marked grave mounds. Several studies in Scandinavia have shown a clear relationship between visible grave mounds from the Viking Age and property rights (Zachrisson 1994, Skre 1998, Iversen 1999, 2008, Ødegaard 2007). There are no known or visible grave mounds from the Viking Age at Høybøen or Hellaug, thus indicating the lack of property rights (see also Zehetner 2007). In the cases of Høybøen and Hellaug, they could have been subordinated to the nearby farms that had increasingly used the areas prior to the permanent settlement.

In Greenland, several subsidiary farms have been documented at varying distances from the main farm, itself often a large farm or a manor (Madsen 2014). At each of these farms there was only one associated shieling, which suggests a setup with a large farmstead or manor, a subsidiary farmstead, and a shieling that together constitute one farm unit (Madsen 2014). Hellaug at least shared the shieling site at Feto and the outland areas further east with Vinja. A shared use of the Vindenes peninsula could also be the case for Høybøen and Vindenes, although the use of outland at the coastal farms was quite different from Hellaug (see below). Also, the relatively long distance from the main farms suggests that Høybøen and Hellaug were not typical holdings. Although there is nothing to imply that Vindenes or Vinja were above-average sized farms in their local community, it is possible that Høybøen and Hellaug represent subsidiary farms, perhaps initially settled by tenants (see Øye 2009b) connected to the main farms. Were these farms independent economic sub-units, or were they specialized but less self-sufficient sub-units; what was the basis for life at these farms?

The infield's cultural importance

The establishment of the farms led to extensive clearing on both sites, as seen in the large number of clearance cairns in the infield areas of both farms. The results from the pollen analysis from Hellaug indicate that both cereal cultivation (barley) and hay production took place in the infield. The physical structure of the infield and the pollen diagram thus suggest that the infield consisted of small plots of fields surrounded by large open areas of meadows, and pastures at some distance from the infield. At Høybøen the physical organization of the infield suggests a similar layout of the infield, with the fields demarcated by terrain and clearance cairns.

It is generally assumed that clearance cairns reflect the presence of cultivated fields, but it may also be that some of the cairns at Hellaug reflect clearance for hay production (cf. Overland and Hjelle 2013). Also, at Høybøen, high percentages of grassland taxa are recorded, indicating that part of the infield could have been used for hay production although the need for winter fodder probably was less in the coastal heathland region than in the mountain valleys. Regardless, scythes and hones were found at both farms, and are important tools for gathering hay and heather.

Although the fields used for crop cultivation at both farms were small, large amounts of energy must have been put into clearing and working the fields, thus indicating their importance. The quern stones and bakestones found at both farms further suggest that cereal was part of the daily diet. Soapstone vessels are also associated with production of porridge (Baug 2015). Bakestones were mainly used for baking bread (Tengesdal 2010), and their presence shows that this was a common daily practice in Medieval households. The North Atlantic islands of Iceland, Shetland, and the Faroes are the only areas where bakestones have been found in large quantities outside Norway (Baug 2015). The bakestones represent the cultural importance of a specific food tradition - a way of baking bread - across the North Atlantic.

If an adult person doing physical work needs c. 3000 calories per day, and one gets c. 3550 calories from 1 kg of barley (see Kaland 1987 for similar calculations) then, based on estimates of output from the fields at Høybøen (Randers 1981a), the farm was not self-sufficient with grain for daily consumption for a household during a year. At Hellaug, the fields were smaller than at Høybøen, suggesting a similar situation. Farms such as Høybøen and Hellaug may, then, have been partly dependent on obtaining grain from outside (see also Kaland 1979). The presence of the arable weed *Centaurea cyanus* (cornflower) at Høybøen (Berge 1978b), is also an indicator that grain was obtained from Bergen. *Centaurea cyanus* is commonly found in medieval layers in the town, in contrast to its absence in the countryside, and is therefore an indicator of foreign trade and cereal import when found in Bergen (Hjelle 1986, 2007). Its presence close to a house at Høybøen probably reflects pollen dispersal through human activity. However, based on the work effort put into the fields, domestic production of grain must have been important. This indicates that grain cultivation was an expression of social and cultural identity (see Svensson 2007), and was rooted in the infield-outfield system (e.g. Øye 2004, Arge 2005, Øye 2009a, Kaland 2014, Prösch-Danielsen *et al.* 2020).

The outfields (*utmark*) as settlement basis

The material culture from the farms, the compressed farmyards with multi-functional houses (see Randers 1981a, Nesset 2013), and the physical organization of the infield show similarities in farming strategies and living conditions at Høybøen and Hellaug. The results also show the importance of outland resources with, however, significant differences in the natural conditions. How did this affect the adaptation to the infield-outfield system?

The changes in the pollen diagrams from Frettestøl broadly dated to the late Viking Age-High Middle Ages are interpreted as indicators that humans and animals stayed in the mountain area for longer periods, thus suggest that a shieling system similar to that of the Early Modern period was established in the area (Kvamme 1985). The development at Frettestøl corresponds with the time when Hellaug was permanently settled. The increased human activity during the transition between the late Iron Age and early Middle Ages is also documented by archaeological and botanical sources from other sites in the Etne mountains (Kvamme 1985, Martinussen and Myhre 1985). The permanent settlement at Hellaug, located at a higher elevation and at some distance from the main farm, corresponds with the increased agrarian importance of the mountain area the farm was a part of. The find of a piece of bloomery slag at Hellaug, as well as the charcoal pits, indicate possible small-scale iron production in addition to hunting activities in the mountain area. However, the scale indicates that these activities were aimed at household consumption. The settlement basis at Hellaug seems to have been related mainly to agriculture, with a focus on pastoralism: an agrarian economy based on vertical transhumance and shieling. This system is characterized by the annual movement of livestock and parts of the household to higher elevations during the summer months (Solheim 1952, Reinton 1955). The natural topographical conditions east of Hellaug with the mountain terraces at different elevations and the location of the Medieval farm facilitated this farming system.

From the pollen diagrams from Herøyvatn and the bog west of Herøyvatn, north of Høybøen, it appears that heather dominated the landscape far back into prehistoric times, but with a marked expansion in the early Iron Age, continuing into the late Iron Age and Middle Ages (Berge 1978b, Mehl *et al.* 2015, Hjelle *et al.* 2018). The intensification of grazing and heathland expansion around Høybøen fits into the general development along the western Norwegian coast (Kaland 1986, Prøsch-Danielsen and Simonsen 2000, Hjelle *et al.* 2010, 2018). The land use at Høybøen accordingly corresponded with the local and regional development on the outer coast during this period.

In the houses at the coastal Høybøen farm, there were several different tools for fishing: a net, a line for fishing at different depths, trolling, and a trident for fishing in shallow waters. A few analysed fishbones of cod, haddock, and common ling from Høybøen (cf. Hufthammer in Randers 1981b) indicate seasonal winter fishing. Historically, farmers along the coast of western Norway and northwards are characterized as fisher-farmers (e.g. Nielssen 2014): the traditional economic organization of the coastal community was a combination of agriculture with some cereal cultivation but with a focus on pastoralism and seasonal fishing. The traditional fisher-farmer economy is associated with an extroverted economy, where fishing was largely aimed at sales and exports from the 11th century onward (Nedkvitne 1988, Nielssen 2014). Stockfish could be imported via long-distance trade, but fresh fish had to be

obtained locally. Thus, the demand for fresh fish stimulated local fisheries, especially around Bergen (Myking 1986). The contact between Høybøen and Bergen can be seen in the material culture at Høybøen, especially the noticeably high prevalence of imported pottery. In the Middle Ages, there was no domestic production of pottery in Norway, thus the commodity clearly indicates trading activities. The provenance of the pottery found at Høybøen is mostly from the eastern part of England, in addition to wares from Germany, Belgium, and southern Scandinavia (Randers 1981a). Although imported pottery is one of the most frequent artefact types found in excavations in the medieval town of Bergen (Demuth 2015), little imported pottery has been found outside the larger medieval towns' immediate surroundings (Demuth 2019). Therefore, the pottery found at Høybøen suggests trade between the Høybøen farm and Bergen. The complete source material from Høybøen thus implies that the fisher-farmer economy was established at Høybøen in the High Middle Ages. This economy was based on the infield-outfield system where the outland resources - including seasonal fishing - made it possible for surplus production.

Concluding remarks

The establishment of the Høybøen and Hellaug farms happened during a time when different types of outland areas became increasingly important to the farming economy in western Norway. The palynological data show an increase in pastoral activities at both sites before the farms were permanently settled. The increased pressure on the outlands during the late Iron Age and early Middle Ages could have been a driving factor to establish farms by tenants in these areas to secure property rights of important resources. This could be the initial settlement basis of the farms. The study further shows how farms in two different types of landscapes adapted the traditional infield-outfield system to their local resource basis, as well as taking part in the development of the local farming economy: the fisher-farmer economy and the establishment of a more organized shieling system with a focus on vertical transhumance. It is likely that the Høybøen and Hellaug areas were not perceived as marginal or peripheral in this period, but an integral part of the agrarian society. Although they were subordinated farms, they were also independent household units, taking part in cultural trends connected to household consumption and land-use practices.

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Full list of participants at the workshops (alphabetical by first name)

Anja Roth Niemi *The Arctic University Museum of Norway*
Barbro Dahl *Museum of Archaeology, University of Stavanger*
Birna Lárusdóttir *Institute of Archaeology, Iceland*
Brita Hope *Department of Cultural History, University Museum of Bergen*
Christian Koch Madsen *Greenland National Museum and Archives*
Dawn Elise Mooney *Museum of Archaeology, University of Stavanger*
Élie Pinta *University of Paris 1 Panthéon-Sorbonne / UMR 8096*
Even Bjørdal *Museum of Archaeology, University of Stavanger*
Douglas Bolender *Fiske Center for Archaeological Research, University of Massachusetts Boston*
Garðar Guðmundsson *Institute of Archaeology, Iceland*
Gísli Pálsson *Department of Archaeology, History, Cultural Studies and Religion, University of Bergen*
Gitte Hansen *Department of Cultural History, University Museum of Bergen*
Guðmundur Ólafsson *National Museum of Iceland*
Guðrún Alda Gísladóttir *Institute of Archaeology, Iceland*
Hildur Gestsdóttir *Institute of Archaeology, Iceland*
Howell Roberts *Institute of Archaeology, Iceland*
Håkan Petersson *Museum of Archaeology, University of Stavanger*
Irene Baug *Department of Archaeology, History, Cultural Studies and Religion, University of Bergen*
James Barrett *McDonald Institute for Archaeological Research, University of Cambridge*
Jennica Einebrant Svensson *Section for Cultural Heritage, Rogaland Fylkeskommune*
Jørgen Rosvold *Norwegian Institute for Nature Research*
Jørn Erik Henriksen *The Arctic University Museum of Norway*
Kari Loe Hjelle *Department of Natural History, University Museum of Bergen*
Kathryn Catlin *Department of Chemistry and Geosciences, Jacksonville State University*
Kathrine Stene *Department of Archaeology, Museum of Cultural History, Oslo*
Kjetil Loftsgarden *Department of Archaeology, Museum of Cultural History, Oslo*
Knut Andreas Bergsvik *Department of Cultural History, University Museum of Bergen*
Knut Paasche *Norwegian Institute for Cultural Heritage Research (NIKU)*
Konrad Smiarowski *Department of Archaeology, History, Cultural Studies and Religion, University of Bergen*
Kristborg Þórsdóttir *Institute of Archaeology, Iceland*
Kristin Ilves *Department of Cultures, University of Helsinki*
Kristoffer Dahle *Section for Cultural Heritage, Møre og Romsdal Fylkeskommune*
Lilja Björk Pálsdóttir *Institute of Archaeology, Iceland*
Lilja Laufey Davíðsdóttir *Institute of Archaeology, Iceland*
Lísabet Guðmundsdóttir *Department of Archaeology, University of Iceland*
Lisbeth Prösch-Danielsen *Museum of Archaeology, University of Stavanger*
Michael Nielsen *Greenland National Museum and Archives*
Mjöll Snæsdóttir *Institute of Archaeology, Iceland*
Morten Ramstad *Department of Cultural History, University Museum of Bergen*
Orri Vésteinsson *Department of Archaeology, University of Iceland*
Per Christian Underhaug *Norwegian Institute for Cultural Heritage Research (NIKU)*

Full list of participants at the workshops

Ragnar Orten Lie *Section for Cultural Heritage, Vestfold og Telemark Fylkeskommune*

Ragnheiður Gló Gylfadóttir *Institute of Archaeology, Iceland*

Ragnheiður Traustadóttir *Antikva ehf., Iceland*

Ramona Harrison *Department of Archaeology, History, Cultural Studies and Religion, University of Bergen*

Símun V. Arge *Department of Archaeology, Faroe Islands National Museum*

Sólveig Guðmundsdóttir Beck *Department of Archaeology, University of Iceland*

Solveig Roti Dahl *Section for Cultural Heritage, Rogaland Fylkeskommune*

Susanne Iren Busengdal *Section for Cultural Heritage, Møre og Romsdal Fylkeskommune*

Therese Nasset *University Museum of Bergen*

Thomas Birch *Department of Conservation and Natural Science, Moesgaard Museum*

Trond Meling *Museum of Archaeology, University of Stavanger*

From the 9th century AD onwards, Norse migration resulted in the spread across the North Atlantic of cultural traits originating in Norway. The challenging landscapes of this region rewarded resilience and adaptability, evidenced by complex subsistence strategies incorporating the exploitation of a variety of outfield resources. However, differing methodologies and approaches across the region have limited the extent to which the connections between western Norway and the North Atlantic have been explored in archaeological research. The Expanding Horizons project brought together junior and senior practitioners in archaeology and related fields, from both within and outside of academia, to address this. The papers in this volume present case studies of outfield resource use and its impact on settlement patterns, placed in the wider context of Norse settlement and subsistence across the North Atlantic.

