

Contents

II Preface

13 The Pitted Ware Phenomenon on Djursland and Maritime Relations across the Kattegat in the Middle Neolithic

An introduction

Lutz Klassen, Rune Iversen & Lisbeth Wincentz

- 13 1 Introduction
- 14 2 The Pitted Ware tradition in Denmark: status of research, research questions and hypotheses
- 23 3 The Djursland peninsula
- 26 4 The CONTACT project
- 29 5 References

35 Kainsbakke and Kirial Bro

The two main sites of the Pitted Ware culture on Djursland

Lisbeth Wincentz

- 35 1 Introduction
- 35 2 Kainsbakke
 - 35 2.1 Landscape and topography
 - 37 2.2 Investigation history and settlement size
 - 38 2.3 Archaeological investigations
 - 58 2.4 The finds
 - 110 2.5 Absolute dating
 - 112 2.6 Subsistence economy
 - 113 2.7 Kainsbakke: Concluding remarks
- 114 3 Kirial Bro
 - 114 3.1 Investigation history
 - 116 3.2 Topography

116	3.3 Archaeological investigation in 1988
119	3.4 Finds
136	3.5 Absolute dating
136	3.6 Subsistence economy
137	3.7 Kirial Bro: Concluding remarks
137	4 References

141 Four minor Pitted Ware culture sites on Djursland

Their individual character and function

Uffe Rasmussen

141	1 Introduction
141	2 Hunting, fishing and flint exploitation in Gjerrild Bay – Musefælden and Neden Skiden Enge
142	2.1 The landscape at Gjerrild Bay
143	2.2 Musefælden
173	2.3 Neden Skiden Enge A1
191	2.4 Flint resources in northeastern Djursland
194	3 Elevated sites with ritual pits – Ginnerup and Skærvad
194	3.1 The landscape of Kolindsund
195	3.2 Ginnerup
227	3.3 Skærvad
238	4 References

243 Pitted Ware culture settlement on Djursland

Overview and interpretation

Uffe Rasmussen, Lisbeth Wincentz, Lutz Klassen & Ole B. Poulsen

243	1 Introduction
243	2 Source-critical considerations
246	3 The two main clusters of PWC sites on Djursland
251	4 Areas of temporary or seasonal PWC activity
253	5 PWC inland activity
253	6 Northwestern Djursland
253	7 Pitted Ware culture grave finds?
255	8 Conclusion
255	9 References

257 The Pitted Ware culture chronology on Djursland

New evidence from Kainsbakke and other sites

Bente Philippsen, Rune Iversen & Lutz Klassen

257	1 Introduction
257	2 ¹⁴ C-dated sites and their contexts
258	2.1 Ginnerup
263	2.2 Kirial Bro
263	2.3 Kainsbakke
271	2.4 Ajstrup Krat
273	2.5 Selbjerg
275	3 Conclusion
276	4 References

279 Herder-hunter-fishers and agricultural contacts

Zooarchaeological perspectives on Pitted Ware animal exploitation strategies from Djursland

Cheryl A. Makarewicz & Sarah Pleuger

279	1 Introduction
279	1.2 The PWC site of Kainsbakke
281	2 Zooarchaeological methods
282	2.1 Survivorship
283	2.2 Biometrics
283	2.3 Skeletal element/part representation
284	2.4 Taphonomy
285	3 Kainsbakke results
285	3.1 Taxonomic and skeletal element breakdown by pit feature
285	3.2 <i>Bos</i> spp.
292	3.3 <i>Sus scrofa</i>
295	3.4 <i>Ovis aries</i> and <i>Capra hircus</i>
298	3.5 <i>Cervus elaphus</i>
299	3.6 <i>Alces alces</i>
300	3.7 Pinnipeds
303	3.8 <i>Ursus arctos</i>
305	3.9 <i>Capreolus capreolus</i>
305	3.10 <i>Equus ferus</i>
306	3.11 Other taxa
306	3.12 Fish
306	3.13 Invertebrate remains
307	3.14 Birds
308	4 Taphonomic analyses of the Kainsbakke faunal assemblage
308	4.1 Bone marrow extraction and trampling

312	4.2 Weathering data
314	4.3 Skeletal element distribution
317	5 Kirial Bro: Zooarchaeological analyses
319	6 Ginnerup: Zooarchaeological analyses
321	7 Conclusions
322	8 References
329	Appendices

341 Exploitation of marine fish by Pitted Ware groups at Kainsbakke and Kirial Bro

Sarah Pleuger & Cheryl A. Makarewicz

341	1 Introduction
342	2 Marine environments in the Kattegat
343	3 Methods: Material recovery and faunal analysis
345	4 Results
348	5 Distribution of skeletal elements
351	6 Carbon and nitrogen isotope analyses of the fish remains from Kainsbakke
352	6.1 Carbon isotopes in marine environments
353	6.2 Nitrogen isotopes in marine environments
353	6.3 Methods
355	6.4 Stable isotope analysis: Results
360	7 Discussion
362	7.2 Fishing activities at Kainsbakke and Kirial Bro – location and technology
364	7.3 The significance of fishing for the subsistence of PWC people on Djursland
365	References

371 Agriculture during the Pitted Ware culture in the Kattegat region?

Marianne H. Andreasen

371	1 Introduction
371	2 Previous evidence of PWC agriculture
371	2.1 Indirect evidence
372	2.2 Direct evidence
373	3 Carbonised cereal grains from PWC contexts
374	3.1 Western Sweden
375	3.2 Kainsbakke (DJM 1900)
380	3.3 Kirial Bro (DJM 1930)
382	4 Discussion
383	5 Conclusion
383	6 References

385 Provenancing Neolithic pottery

An investigation of the elemental composition of Pitted Ware and Funnel Beaker pottery from Djursland and adjacent regions

Malou Blank, Torbjörn Brorsson & Imelda Bakunic Fridén

385	1 Introduction
385	2 Pottery and sites
387	3 Pottery analysis and statistics
389	4 Results and discussion: The elemental composition of pottery from Djursland and adjacent regions
389	4.1 The elemental composition of TRB and PWC pottery
392	4.2 Inter-regional variations in the elemental composition of Neolithic pottery
394	4.3 Elemental composition of pottery compared between sites
397	4.4 Techniques, recipes and materials employed in pottery production in eastern Jutland
398	5 Conclusions
399	Abbreviations
399	6 References
401	Appendix

407 Strontium and lead isotope studies of faunal and human remains from Kainsbakke and Kirial Bro

Lutz Klassen, T. Douglas Price, Karl-Göran Sjögren, Lisbeth Wincentz & Bente Philippsen

407	1 Introduction
408	2 Sr isotope provenancing
408	2.1 Principles of Sr isotope analysis
409	2.2 Sr isotope baselines
429	3 Bears, Eurasian elk/elks and a human
429	3.1 The human from Kainsbakke
429	3.2 Eurasian elks from Kainsbakke
430	3.3 Brown bears from Kainsbakke
432	4 The origin of non-local animals
432	4.1 Brown bear and Eurasian elk
436	4.2 Red deer and cattle
437	5 Pb (lead) isotope analysis
441	6. Summary and conclusion
442	7. References

447 Genetic sex and haplogroup identification of the Pitted Ware culture human upper jaw from Kainsbakke, Denmark

Morten E. Allentoft

- 447 1 Introduction
- 448 2 DNA extraction, library preparation and sequencing
- 448 3 Bioinformatics
- 448 4 Molecular authenticity
- 449 5 Mitochondrial haplogroup and sex determination
- 449 6. Conclusion
- 450 Acknowledgements
- 450 7. References

451 The Pitted Ware culture on Djursland in the Neolithic world

Lutz Klassen, Rune Iversen, Niels Nørkjær Johannsen, Uffe Rasmussen & Ole B. Poulsen

- 451 1. The identity of the Pitted Ware culture on Djursland
- 452 1.1 Material culture
- 452 1.2 Economy
- 452 1.3 Settlement and land-use
- 453 1.4 Ritual activities and graves
- 465 1.5 Genetic information
- 465 1.6 Appearances and reality: The nature of the PWC group on Djursland
- 466 2. Why Kainsbakke? The site and its surroundings in the late Early and early Middle Neolithic
- 466 2.1 The landscape setting of the Kainsbakke site
- 468 2.2 A TRB ritual superstructure
- 471 2.3 A TRB depositional landscape
- 472 2.4 Parallels to the ritual structures and sites around Kainsbakke
- 473 2.5 The flint resources of northeastern Djursland and their importance for the Kainsbakke site
- 476 3. Kainsbakke and the Pitted Ware culture on Djursland in a wider geographical context
- 477 3.1 The emergence of the Pitted Ware culture on Djursland
- 480 3.2 The major deposition in pit A47 and the end of the Pitted Ware culture on Djursland
- 483 4 References