cut outward, thus the more resistant is the material to flexing the more difficult it is to cut. The extensive wear presented in the photomicrographs is likely the result of the sides of the edge rubbing against the sides of the cut and not wear on the cutting edge itself. The burin solves this problem by ensuring that the cut or groove is wider than the penetrating portion of the tool.

The author also makes the same fallacy that so many others have made. Projectile points may show wear traces that indicate impact against an object. It is a major logical step to infer that a tool with impact damage is the result of a tool used as a projectile point for hunting. For example, wedges also show impact damage. While I am not suggesting that a tool that conforms morphologically to an arrow or spear head and has impact damage should be interpreted as a wedge, I do suggest that the inference on how the impact damage was produced must be supported by other evidence.

The monograph provides the reader with about 80 pages describing the wear and its interpretation at the three sites at the heart of this study. Confronted with poor preservation at one of the sites (Bois Laiterie Cave), the author creatively uses both low and high magnification approaches at all sites so that comparisons can be made. Of course, if there is poor preservation of surface wear features, should one still assume that the fracture damage is unaffected at the site?

The author provides a comparative assessment and his conclusions of the three sites in four pages. Given that this is what archaeologists really want to know, have we been cheated or mislead into thinking that we would know much more about the functional variability in the Late Upper Palaeolithic rather than be given such a detailed presentation of the author's ability to do traceology? A monograph should be more than a published dissertation. The author should think carefully of his audience and ensure that contents are appropriately presented to ensure confidence in the method, but also that there is adequate interpretation of the archaeology.

This is an extremely high quality production of a dissertation. The layout, the paper, and the printing indicate the quality of the production—only the card cover somewhat undersells the contents of the volume. I was most impressed with the photomicrographs, although a lack of a scale within the figure may leave readers wondering if the publisher avoided resizing figures making the caption scales useless. I was particularly frustrated by the lack of an index, and for that matter, lack of a glossary. The author uses a few terms in ways that are not consistent with other researchers. Of note is "edge angle", which the author is probably referring to "edge spine angle", but this can only be confirmed with a definition. There are a few minor spelling errors, but these do not detract from the overall quality of the writing.

## Lateglacial and Postglacial Pioneers in Northern Europe

**Felix Riede and Miikka Tallaavaara (eds.), BAR S2599, Oxford, Archaeopress, 2014, 206 pages, paperback, £ 35.00,**
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Exploration of unknown areas and an attempt to settle these hardly known patches, i.e. pioneering, is a driving force in the expansion of modern humans. Besides our own planet, this pioneer spirit brought humans to the moon and already motivated thousands to apply for a mission to colonise our neighbouring planet, Mars. Thus, this driver is a fascinating and still important subject to study. Many questions are related to this research such as: How did this driving force develop? What created this pioneer spirit initially? Who is a pioneer? What characteristics are necessary in order to be a pioneer? What triggers pioneering movements? How do these movements develop? What stops pioneers? In particular, this latter question can be studied by past human attempts to colonise inhospitable environments. As in Sergio Leone's 1968 classic western film (Once upon a time in the west), various obstinate human characters were presumably required for the settlement of desolate landscapes such as those present in Northern Europe after the retreat of the massive Weichselian ice sheets. In fact, an analysis concerning the human expansion into post-glacier environments in Northern Europe appears as a perfect archaeological case study to gain insights in this possibly adventure-seeking part of human nature that drives our species to repeatedly enter into the great unknown.

In a recently published B.A.R. volume, 14 contributions about these *Lateglacial and Postglacial Pioneers in Northern Europe* try to shed light on these characters, their origins, their motivations, and their tracks to the far north of Europe. 13 of these papers were originally presented in a session devoted to the same topic held at the EAA meeting 2011 in Oslo (Norway). They are supplemented by an introductory chapter written by the session organisers.

As with most proceedings, these contributions can usually represent only a foretaste of more in-depth research publications due to the limited space. However, the various authors made a good job presenting single stories of pioneers or more often early settlers who arranged themselves within their social and natural environments. The focus on Northern Europe has a slight imbalance towards eastern Fennoscandia but articles about western,

northern, and southern parts of this region as well as a few contributions from areas south of Fennoscandia make this volume a good overview of the human expansion into this north-eastern part of Europe. Unfortunately, there are no contributions from the Baltic States and northern Germany to complete the geographic extension around the modern Baltic Sea and to connect different tracks and possible origins of the various northward movements. Moreover, DNA analyses which have delivered interesting results about population histories in the last years (cf. Der Sarkissian et al. 2013; Skoglund et al. 2014) were also not acquired. Despite the scarce human record from Fennoscanida, DNA studies certainly would have formed an interesting supplement to a debate about the early human colonisation of this region.

Focused on the (archaeologically visible) pioneer settlement of Northern Europe, all articles considered chronological aspects more or less prominently. The chronological considerations were mainly based on calibrated radiocarbon dates. In three cases, these radiometric results formed a fundamental basis of the analysis (Mortensen et al., Riede, Tallavaara et al.), although another contribution (Pedersen) rightfully advised a more critical use of radiometric results as sole instrument of following the expansion process. Nevertheless, in this volume, the radiometric measurements were regularly contextualised in local environmental developments such as vegetation and sea level changes making evaluations of their reliability in general plausible. Another point in Pedersen's article is the differing results of calibration curves. In this regard, a positive observation reading these proceedings is that most contributors reported, besides the laboratory and calibrated dates, also the calibration program, the calibration curve, and the precision with which their calibrated dates are given. This information enables the readers to evaluate the argumentation and replicate the results. However, a typical problem in this context reveals a lack of previous agreement of the contributors on how the calibrated dates should be reported. Although the laboratory dates were usually given in $^{14}$C-BP, the calibrated ages varied between cal. BP, cal. BC, b2k, and forgotten precisions making a quick comparison difficult (in addition to the use of different calibration curves and programmes, of course). Occasionally, the comparison becomes even more confusing when the same dates for the same sites were mentioned in different articles and in different calibrated forms. In this respect, a stricter guideline of reporting calibrated results within the entire volume would have been desirable for the readers. Formal weaknesses in proofreading and editing are unfortunately numerous in this volume. Usually, misspelled words, mistaken translations of non-native speakers, divergent nominations, forgotten or additional spaces, and forgotten citations should be eliminated by a last revision performed by editors and / or publishers who should also ensure a uniform quality of illustrations and photos. An obvious proof that this revision failed for the present volume is the misspelled name of one of the editors on the front cover; a fact that certainly is not only annoying for the attentive reader.

Nonetheless, the content of this volume delivers a wide collection of archaeological analyses which due to preservation conditions were mainly based on lithic remains. These lithic studies already display a range of approaches from experimental flintknapping and micro-wear analysis (Pyżewicz et al.) over typo-technological traditions (Kleppe, Kankaanpää & Rankama) to raw material procurement and mobility strategies (Gustafsson) giving diverse insights in human colonisation processes.

In addition, these archaeological traditions found across Northern Europe indicate transmission chains and suggest movements of different human groups into this area. In particular, western and eastern routes can be distinguished. A map in one of the last contributions (Pesonen et al.) which locates some of the frequently used cultural terms at least geographically in Northern Europe is very helpful for those readers who are not yet familiar with this region and / or this time period, but clearly this type of map would have been even more appreciable at an earlier place in the volume.

The general incompleteness of the archaeological record in Northern Europe due to the lack or organic preservation is contrasted by the exceptional preservation at the early settlement site at Motala in Sweden (Molin et al.). The large variety, in particular of organic materials, gives an impression of information that was lost at and around most sites. However, Sobkowiak-Tabaka shows how large-scale investigations can fill blank spots and can also contribute to a more complete picture of past landscape use with almost exclusive lithic preservation. That these large projects are only possible within well-financed (road construction) projects is an often lamented fact but the contribution of Takala shows that systematic surveys even with less financial means are a productive and important enterprise.

Despite the general scarcity of organic preservation in Northern Europe, the exceptions are regularly used in these proceedings to contextualise the pioneer movements and early settlements with their environment. For example, when the search for organic material led to the identification of blubber concrete which develops from firing animal blubber oil and that was probably used as a substitute for wood (Pettersson & Wikell), this results delivers in a bare archipelago context much more information than a simple radiometric measurement. This purpose to localise past hunter-gatherers in their environment explains the array of scientific analyses used not only in these proceedings, but more generally in archaeology. By these scientific efforts, the different routes into northern Fennoscandia were shown to be

generally related to different environments (marine in the west and terrestrial in the east). These relations were probably based on the previous adaptations of the subsistence economies and, consequently, the northward moving was mainly along landscapes which seemed familiar to the hunter-gatherers. Nevertheless, "While the logic of the landscapes, and resources encountered seemed familiar, their topology and exact nature had to be discovered or rediscovered." (Kleppe, p. 122). Several contributions display how the latter remained a continuous effort in some parts of the studied region during the Lateglacial and early Postglacial because of the on-going retreat of the large inland ice-sheet causing glacial meltwaters and land uplift which also resulted in changes of the extent, sea-levels, and salinity of the Baltic Sea and its predecessors. A specific problem of pioneers and early settlers in this continuous landscape learning process is the lack of additional social information (see Rockman in Rockman & Steele 2003). Thus, the gathering of information and the risk of this gathering remained with the pioneer group. Consequently, the pioneers had to make a decision as to which degree of detail in the knowledge of the landscape was necessary for their survival. Kankaanpää and Rankama show impressively how this decision in combination with patchy distributions of resources can lead to fast and slow colonisation processes depending on the degree of adaptation to the local resources. Consequently, fast processes introduced behavioural standards developed elsewhere with only minor alterations into previously uninhabited areas with similar economic conditions as the areas of origin. In contrast, profound changes in economical behaviour appeared as a necessary adaptation to important resources during slow colonisation processes.

If this model is used on the example from the article of Mortensen et al. in which the authors nicely show that the organic material resulted from a very brief period of human presence, an episode in a fast colonisation process can be suggested. Since important economic resources (reindeer and flint) seemed present at this site, established behavioural standards were maintained. However, according to this model, the triggers leading to the appearance of these behavioural standards must in this case be sought elsewhere.

Thus, a lot can be learned about pioneer movements into inhospitable landscapes by a synopsis of this volume. Although the editors (Riede & Tallavaara) hope to succeed in the emergence of new data and flourishing of a new debate about colonisation issues, they do not make a good start for the latter by neglecting to supplement a concluding chapter. The regular contributions presented new data but, with very few exceptions, discussions of colonisation issues remain on the level of well-trodden local to regional concepts. Also the concept-based article of one of the editors (Riede) cannot revise this impression because the presented theoretical concepts were only insufficiently tested against the mentioned archaeology. In contrast, Gustafsson demonstrates how an evaluation of our concepts could be made on a small scale. Furthermore, the editors' outline of a general geographical (and temporal) order in the volume does not counteract the occasional impression that the contributions appear unconnected and, therefore, seem like a conglomerate which could have needed more than the introduced umbrella of early human settlements to connect them. Perhaps, Kleppe's contribution about the Finnmark where the two main routes into northern Europe met comes closest to a connection of the various lines of evidence. Hence, a concluding chapter synthesising or at least summarising the various answers given to the initially introduced questions of the session and the adjustments that have to be made to the possible colonisation scenarios formulated in the introduction would have made this volume the anticipated flourishing of a new debate about colonisation processes and the study of pioneer movements. Without this conclusion, the focus remains on the archaeological case studies rather than on the major subject of the pioneering spirit. The essence of this drive gets lost in the very different reasons, processes, and occasional failures during the northward expansion presented in this volume. Perhaps, this impression of an rather loosely connected conglomerate of research very appropriately reflects the diversity of pioneer and early settler dynamics during the Lateglacial and early Postglacial in Northern Europe.

In summary, only a few papers in this volume are recommendable (e.g. Gustafsson, Kankaanpää & Rankama) for anyone interested in good, archaeological examples of human pioneering and a debate about colonisation processes. In general, other books could be of much greater interest for those readers (e.g. Rockman and Steele 2003). Nevertheless, the editors' belief that this volume is useful can be agreed upon by all those who want to be introduced to the earliest human settlement of Fennoscandia. In other words, who wants to know how Europe's far north was won should certainly begin with reading this volume that offers a geographically wide-ranged potpourri of views on this topic.

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## Tybrind Vig. Submerged Mesolithic settlements in Denmark.

**Søren H. Andersen with contributions by Bodil Bratlund, Kjeld Christensen, Hans Dal, Kasper Johansen, Lise Bender Jørgensen, Claus Malmros, Ole Nielsen, Kaj Strand Petersen, Kirsten Prangsgaard, Kaare Lund Rasmussen and Tine Trolle, Jutland Archaeological Society Publications Vol. 77, Jysk Arkæologisk Selskabs Skrifter, 2013, Aarhus, 527 pages, Hardback, 68.00 Euro, ISBN 978 87 88415 78 0**

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Tybrind Vig, off the island of Fyn, is the largest Danish underwater excavation of a Mesolithic settlement site carried out to date with regard to the extent of the excavated area, the exclusiveness of archaeological artefacts and the diversity of preserved materials. Therefore the site, and not least the author, have fundamentally contributed to our knowledge about environmental circumstances and economic conditions during the Ertebølle period and have provided unique insight into cultural and social life of a coastal hunter-fisher-gatherer community.

The Ertebølle Culture is concentrated in the south-western Baltic region and is spread over Southern Sweden, Denmark, Northern Germany and Northwest Poland. This cultural manifestation is absolutely dated between 5400 and 4000 calBC. Actually, the Ertebølle Culture is the transitional period between Mesolithic and Neolithic lifestyles in Northern Central Europe, where hunter-fisher-gatherer societies lasted longer than in more central regions. Therefore, the investigations in this field were received with great interest and discussed intensively by different scholars following different research trends. Due to this wide reception, Tybrind Vig is justifiably one of the most famous archaeological sites in Europe. Consequently, the publication of Tybrind Vig as a monograph in English is a great chapter of research history.

The completion of this publication is due to Søren H. Andersen, who had the patience and elaborateness to present this comprehensive compilation, although the evocative highlights about the site were already well known. In the course of almost his entire scientific career, Søren H. Andersen spent time investigating Mesolithic Stone Age cultures, such as Maglemose, Kongemose and the Ertebølle Culture at Moesgård Museum and Aarhus University. Among other things, he has already even published numerous articles in Danish and international journals about the results and findings of the site Tybrind Vig (e.g. Andersen 1985; 1987). But now, at the culmination point of his scientific life, it is his great achievement to summarize with other specialists all information available about Tybrind Vig from published and unpublished reports. Together with his previous book about Ronæs Skov, another underwater site in the Little Belt (Andersen 2009), Andersen provides all his knowledge for following generations of researchers.

The book is divided into two broad parts. In part 1, Andersen primarily presents facts about the site, results about the main find categories and a discussion about social and economic questions. This discussion is completed by information about other Ertebølle settlements in the region and by comparisons with neighboring regions. Part 1 ends with a conclusion and an outlook concerning further investigations in the future (pp. 317–324). In part 2, various reports are included, mainly by natural scientists about special investigations. Some of these manuscripts were originally submitted up to 15 years ago. But this does not diminish the value of the scientific work. Most important is that all information is now collected in one book. In the following, I will lead through the chapters of part 1 and will refer to the reports in part 2 as I proceed.

Chapter 1 is the most important chapter in this book and nearly every question one could have about the site is discussed in separate sections. At the beginning of the chapter, the particular story on the discovery of the site is told from the personnel point of view of the author so that the reader can really dive into the research history (pp. 11–14). Then details about geology, ancient coastlines, sea level changes, natural conditions revealed by faunal and pollen remains as well as local topography and deposition of artefacts at the site are explained (pp. 15–29). Further detailed information about geological conditions, as revealed by the marine molluscan fauna, is described by Kaj Strand Petersen in part 2 of the book (355–361). The excavation methods, environmental investigations, stratigraphy and absolute chronology are also discussed in chapter 1 (pp. 33–53). Additionally, particulars of radiocarbon dating and dendrochronological analysis are presented in part 2 of the book by Kaare Lund Rasmussen (pp. 363–364) and Kjeld Christensen (pp. 365–376).

Throughout the long duration of investigations in Tybrind Vig, remains of different settlement areas were excavated, denoted as settlements A-D (pp. 29–33), but settlement B provides the principal and most important portion of the available information. Here, different layers could be identified which demonstrate that a population group either lived there all year round or within a series of separated