

# 1. Introduction

This contribution endeavours to assess the representativeness of the evidence for settlement from the Late Glacial and Early Holocene of Scotland and assumes, as its point of departure, the study of landforms which afford propitious conditions for the *in situ* preservation of cultural material. It also considers those processes, both natural and anthropogenic, which have obscured or obliterated evidence for human occupation in these remote periods. The biases inherent in the research traditions of hunter-gatherer studies are then outlined; these have skewed the distribution of the evidence by according priority to the investigation of certain regions or types of settlement above others. A study of all these processes and traditions is beyond the purview of this paper, so only a summary of the principal factors affecting the preservation and visibility of sites from the Late Glacial and Early Holocene is presented here. The rôle of fortuitous discoveries made by amateur organisations, and those that have occurred during the course of excavations enjoined by planning authorities, cannot be judiciously treated in such a short contribution despite these having resulted in the most significant advancements in our knowledge of hunter-gatherer occupation in Scotland during the last twenty years. Only a cursory mention of the biases in distribution of archaeological investigations undertaken in response to planning conditions and those studies conducted by amateurs is therefore offered.

The landscapes and features discussed are those commonly encountered in Scotland: hills, river terraces, lakes, and coasts. Nonetheless, it must be recognised that by selecting such broad geographical categories there is a risk that significant differences within each class of feature are obscured for the sake of the analytical convenience. All statements proffered here should, therefore, be regarded as working hypotheses subject to verification or falsification based on detailed studies of erosional processes and land-use history prevailing in the region. Indeed, in any study that purports to assess the representativeness of the evidence the examination of erosional processes, alluviation or colluviation, and the impact of agriculture or industrial exploitation on the landscape must figure prominently. This contribution can only limn these as it is concerned with the nation as a whole; detailed examination of such processes can only be undertaken within narrowly circumscribed regions. Having thus divested the study of any grandiose ambitions, it remains to justify its limited objectives as worthwhile.

Few scholars have an explicit interest in the Late Glacial and Early Holocene human occupation of Scotland; the emergence of regional research biases was therefore inevitable as there are insufficient numbers or researchers to diffuse across the entirety of the nation. Most of this research, with notable exceptions, has been concerned with the Atlantic coast of Scotland. The North Sea coast and the interior have not been explored systematically and

thus their potential has often been unappreciated. If our understanding of human settlement in these periods is to advance, we have an especial need to excavate sites affording stratification and organic remains which permit a refinement of the typo-chronological sequence and also the reconstruction of the economic foundation of settlement (Saville 2004, 213). An opportunity to achieve this is afforded by the investigation of the interior of Scotland, principally sites adjacent to fossil lakes and on the river terraces. This paper attempts to explain why these locations may be more profitably investigated to realise these ambitions than sites elsewhere in Scotland and exhorts those with an interest in hunter-gatherer occupation to not focus entirely on the coasts, and to incorporate studies of the hinterland in their investigations.

## 2. The Late Glacial

The Late Glacial episode had a duration of roughly four millennia—it is as long as the Mesolithic, or both the Neolithic and the Bronze Age when combined. Recent chronometric date refinement and calibration has suggested that this period should be situated to between *ca.* 15,000 – 11,000 BP (Blockley *et al.* 2004, 159). An expansion of human settlement from the Rhineland and Parisian Basin into north-western Europe appears to have commenced at *ca.* 16,000 BP and reached northern Germany and the British Isles at *ca.* 14,000 BP (Barton *et al.* 2003, 640; Blackwell & Buck 2003, 236; Fort *et al.* 2004, 58 - 59).<sup>\*</sup> The occupation of the British Isles appears, on current evidence, to have been interrupted as there is no indication of settlement in the latter part of the Windermere Interstadial and the Loch Lomond Readvance (Barton 1991, 235; Jacobi 1981, 73). This interruption or curtailment of occupation has been attributed to a deterioration of climate and a withdrawal of settlement to less inclement regions.

A copious literature has emerged which pertains to the palaeoenvironmental conditions in Scotland during the Late Glacial. The vicissitudes in temperature, the lineaments of floral succession, patterns of mammalian colonisation, and trends in soil development have been the objects of intensive study and their relationship to changes occurring elsewhere in northern Europe and the North Atlantic well defined (the best and most accessible synoptic studies are those of: Ballantyne 2003; Edwards 2003; Kitchener 1998; Tipping 1991). A brief summary of the diachronic change is appropriate before proceeding to an assessment of settlement and preservation of archaeological sites from the Late Glacial because this period was, above all, one of climatic instability. The changing flora, fauna, and climatic conditions must have affected the location of settlements and their preservation. This section affords an overview of these conditions and also

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\* It is apposite to mention that these papers situate the colonisation at slightly different times and disagree regarding the statistical methods and interpretation of the results, but the date of *ca.* 14,000 cited here is recognised by all as clearly encompassing the early phase of colonisation. This, too, is in accord with the results of the statistical analysis by Housley *et al.* (1997, 48).

considers the most propitious locations for which to search for evidence of human occupation in the Late Glacial and the methods most appropriate for the recovery of this material.

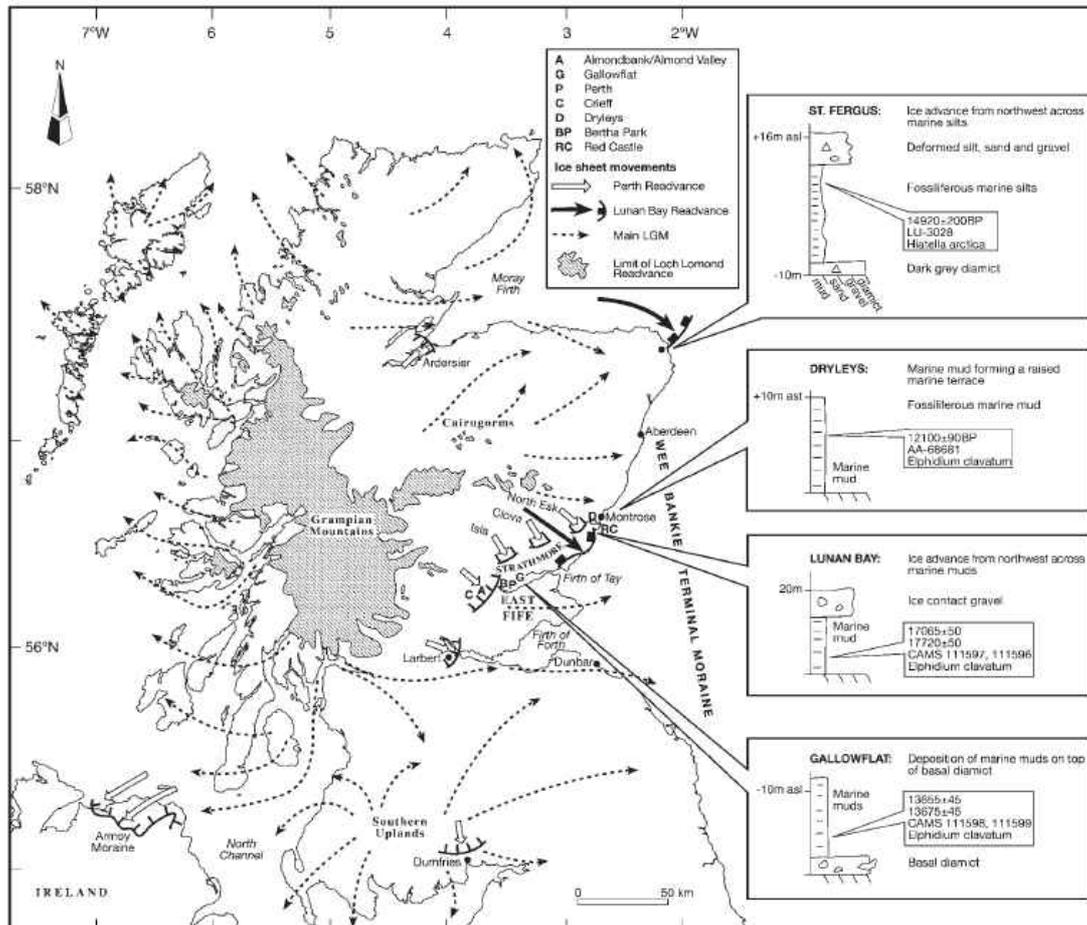


Illustration 1: The deglaciation of different regions in Scotland according to recent research (McCabe et al. 2007, 314)

The deglaciation of Scotland begins somewhat earlier than had formerly been supposed; basal deposits in lakes have provided dates for ca. 13,000 BP, but it is likely that the organic material in these sediments reflect an episode of increased ecological productivity and not the earliest evidence for the withdrawal of the ice-sheets (Tipping 1991, 9). This should be considered concurrently with the dates derived from  $^{10}\text{Be}$  analyses in the Cairngorms, which situate the deglaciation of this region between  $14,400 \pm 400$  BP and  $13,600 \pm 300$  BP (Everest & Kubick 2006, 100). The deglaciation of lands at lower altitude most probably occurred even earlier; studies from eastern Scotland have revealed that deglaciation occurred in this region at ca. 21,000 BP (McCabe et al. 2007, 315). Early dates for deglaciation have begun to emerge from peat-bogs in the coastal lowlands of North Northumberland (Ian Boomer, personal communication) and it is likely that this obtains also for the lowlands of the Scottish Borders and the Lothians.

The soil development and evolution of floral communities in those districts that experienced deglaciation early might be expected to have been well advanced of those that underwent the same process several millennia later. No evidence, however, exists in the pollen records to corroborate this inference. Instead, it seems that the main obstacle to soil development and the colonisation of Scotland by different floral species was temperature and the rate of migration of different plant and tree species northward from their Late Glacial refugia. The first significant warming episode in northern Europe began at roughly 13,000 BP and had a duration of three centuries. Until this point, extreme cold prevailed and there were probably also episodes of drought (Kolstrup 1982, 59); the cold and arid conditions resulted in aeolian activity and the creation of coversand formations in some locations and the deflation of others. Temperate conditions approximating those current in Scotland today were established between 13,000 BP – 12,7000 BP (Ballantyne 2004, 30). This process is reflected in the aforementioned evidence of increasing organic content in lakes. Once a floral was established, the landforms became more stable and less likely to experience deflation by aeolian activity and solifluction.

Nonetheless, the process of soil development and the establishment of floral communities differed according to aspect, moisture and the weathering of sediment. A more diverse and luxuriant vegetation cover could be sustained in places with sufficient moisture and shelter; this would undoubtedly have attracted more animals and represented something akin to an oasis in an environment of relatively low biotic productivity. It is noteworthy in this connexion that the most significant sites from the Late Glacial occur in such locations: the complex of sites in the Ahrensburg Tunnel Valley (Rust 1937, 1943), Jels (Holm & Rieck 1992), and Slotseng (Holm 1993). In such locations, it would be difficult to identify sites through the traditional methods of fieldwalking as the cultural deposits would be too deeply buried for the plough to disturb them. Moreover, the stripping of sediment layers by machine would also be unlikely to reveal such deposits if those undertaking this work were not sufficiently familiar with the complexities of wetland stratigraphic succession. All too often, excavation machines are used to remove topsoil and the first horizon of sterile minerogenic sediment is declared the natural substratum and further work is not carried out. The potential of looking beneath the horizons of minerogenic soil is well illustrated by the section cut through the coversands of western Jutland presented below (Illustration 2).

The likelihood of identifying sites in such environments through commercial excavations or through fieldwalking assays is therefore quite low and there would consequently be no entries in the *Historic Environment Register*. Again, many of the methods commonly employed to locate sites in commercial archaeological work would likely result in Late Glacial sites not being recognised. The thin soils on hills are likely to have been ploughed up; thus, stripping the sites with excavating devices would remove all evidence of Late

Glacial occupation. Analyses of Paleo-Indian sites in the Great Lakes littoral of North America have demonstrated that scatters of artefacts in the plough soils can still result in important insights concerning settlement size and even the location of hearths (Ellis & Deller 2000, 36; Shott 1993, 27; Storck & Eley 1997, 43). Similar studies in the Low Countries have also proved to be extraordinarily profitable (Caspar & De Bie 1996, 438; De Bie *et al.* 2002, 139 – 142; Rensinck 2002, 181 - 182). A recognition of the peculiar conditions that obtained in the Late Glacial should compel us to alter our methods of survey and espouse different excavation techniques. As we know so little about Late Glacial human occupation in Scotland, it is important at this stage of research to recover any evidence, so even material that has been re-deposited through colluvial and alluvial action is significant for us to appreciate the diversity in material culture.

The search for sites along the raised beaches must also be cognisant of similar processes, namely, the likelihood that the Late Glacial soils have been ploughed up. As other contributions examine the complexities of isostatic rebound and eustatic rise, there is no occasion here to discuss the obvious potential of these features for the provision of evidence for Late Glacial and Early Holocene human occupation. It only remains to emphasise the waxing body of evidence suggesting widespread maritime exploitation throughout the Late Glacial in northern Europe, most saliently demonstrated by the sites of the Hensbacka and Fosna Culture of Sweden and Norway (Schmitt *et al.* 2009; Fischer 1996).



*Illustration 2: An example of the complexities of Late Glacial stratigraphic succession in western Jutland. Stopping at the first horizon of minerogenic soil would miss potentially rich organic deposits (Kolstrup et al. 2007, 317)*

## References

- Barton, Nicholas & Alison J. Roberts & Derek A. Roe (editors). 1991. *The Late Glacial in North-West Europe: Human Adaptation and Environmental Change at the End of the Pleistocene*. (Council for British Archaeology Report No. 77). London: Council for British Archaeology.
- Barton, R.N.E., Roger M. Jacobi, Dick Stapert & Martin J. Street. 2003. The Late-Glacial Reoccupation of the British Isles and the Creswellian. *Journal of Quaternary Science* 18 (7): 631 – 643
- Bjarke Ballin, Torben & Alan Saville. 2003. An Ahrensburgian-Type Tanged Point from Shieldaig, Wester Ross, Scotland and Its Implications. *Oxford Journal of Archaeology* 22 (2): 115 – 131
- Blackwell, Paul G. & Caitlin E. Buck. 2003. The Late Glacial Human Reoccupation of North-western Europe: New Approaches to Space-Time Modelling. *Antiquity* 77 (296): 232 – 240
- Blockley, Simon P.E., John J. Lowe, Michael J. Walker, Alessiandro Asioli, Fabio Trincardi, Geoffrey R. Coope, Randolph E. Donahue & A. Mark Pollard. 2004. Bayesian Analysis of Radiocarbon Chronologies: Examples from the European Late Glacial. *Journal of Quaternary Science* 19 (2): 159 – 175
- Caspar, Jean-Paul & Marc De Bie. 1996. Preparing for the Hunt in the Late Paleolithic Camp at Rekem, Belgium. *Journal of Field Archaeology* 23 (4): 437 - 460
- Crombé, Philippe & Cyriel Verbruggen. 2002. The Lateglacial and Early Postglacial Occupation of Northern Belgium: The Evidence from Sandy Flanders. In (editors) Berit Valentin Eriksen & Bodil Bratlund. pp. 165 - 180
- De Bie, Marc, Utsav A. Shurmans & Jean-Paul Caspar. 2002. On Knapping and Living Areas: Intrasite Differentiation at Lake Palaeolithic Rekem. In (editors) Berit Valentin Eriksen & Bodil Bratlund. pp. 139 – 164
- Ellis, Christopher J. & D. Brian Deller. 2000. *An Early Paleo-Indian Site Near Parkhill, Ontario*. (Canadian Museum of Civilization, Archaeological Survey of Canada Mercury Series Paper No. 159). Ottawa: Canadian Museum of Civilization.
- Eriksen, Berit Valentin (editor). 2006. *Stenalderstudier. Tidligt mesolitiske jæger og samlere i Sydsandinavien*. (Jysk Arkæologisk Selskabs Skrifter 55). Århus: Jysk Arkæologisk Selskab.
- Eriksen, Berit Valentin & Bodil Bratlund (editors). 2002. *Recent Studies in the Final Palaeolithic of the European Plain: Proceedings of a UISSP Symposium, Stockholm, 14-17 October 1999*. (Jutland Archaeological Society Publications Volume 39). Århus: Jutland Archaeological Society.
- Everest, Jeremy & Peter Kubik. 2006 The Deglaciation of Eastern Scotland: Cosmogenic <sup>10</sup>Be Evidence for a Lateglacial Stillstand. *Journal of Quaternary Science*, 2 (1). 95-104
- Fischer, Anders. 1996. At the Border of Human Habitat: The Late Palaeolithic and Early Mesolithic in Scandinavia. In (editor) Lars Larsson. pp. 157 - 176
- Gooder, John. 2007. Excavation of a Mesolithic House at East Barns, East Lothian, Scotland: An Interim View. In (editors) Clive Waddington & Kristian Pedersen. pp. 49 – 59
- Holm, Jørgen. 1993. Settlements of the Hamburgian and Federmesser Cultures at

Slotseng, South Jutland. *Journal of Danish Archaeology* 10: 7 – 19

- Holm, Jørgen & Flemming Rieck. 1992. *Istidsjægere ved Jelssøerne. Hamburgkulturen i Danmark*. (Skrifter fra Museumsrådet for Sønderjyllands Amt, 5). Haderslev: Museumsrådet for Sønderjylland.
- Housley, Rupert A., Clive S. Gamble, Martin Street & Paul Pettitt. 1997. Radiocarbon Evidence for the Lateglacial Human Recolonisation of Northern Europe. *Proceedings of the Prehistoric Society* 63: 25–54
- Kitchener, Andrew C. 1998. Extinctions, Introductions and Colonisations of Scottish Mammals and Birds Since the Last Ice Age. In (editor) Robert A. Lambert. *Species History in Scotland: Introductions and Extinctions Since the Ice Age*. Edinburgh: Scottish Cultural Press. pp. 63-92.
- Kolstrup, Else. 1982. Late-Glacial Diagrams from Hjelm and Draved Mose (Denmark) With a Suggestion of the Possibility of Draught During the Earlier Dryas. *Review of Palaeobotany and Palynology* 36 (1): 35 – 63
- Kolstrup, Else. 1991. Palaeoenvironmental Developments During the Late Glacial of the Weichselian. In (editors) Nicholas Barton, Alison J. Roberts & Derek A. Roe. pp. 1 – 6
- Kolstrup, Else. 1992. Geologi og klima i sen-glacial tid—med særlig henblik på Hamburg-bopladserne ved Jels. In Jørgen Holm & Flemming Rieck. pp. 133 - 144
- Kolstrup, Else. 2002. Some Classical Methods Used for Reconstruction of Lateglacial Environments in the European Plain: Potentials and Limitations. In (editors) Berit Valentin Eriksen & Bodil Bratlund. pp. 11 – 23
- Kolstrup, Else, Andrew Murray & Göran Possnert. 2007. Luminescence and Radiocarbon Age from Laminated Lateglacial Aeolian Sediments in Western Jutland, Denmark. *Boreas* 36 (3): 314 - 325
- Larsson, Lars (editor). 1996. *The Earliest Settlement of Scandinavia and Its Relationship With Neighbouring Areas*. (Acta Archaeologica Lundensia Series in 8°, No. 24). Stockholm: Almqvist & Wiksell International.
- Mellars, Paul (editor). 1987. *Excavations on Oronsay: Prehistoric Human Ecology on a Small Island*. Edinburgh University Press.
- Møller Hansen, Keld & Kristoffer Buck Pedersen (editors). 2006. *Across the Western Baltic: Proceedings from an Archaeological Conference in Vordingborg*. Vordingborg: Sydsjællands Museum.
- Muholland, Helen. 1970. The Microlithic Industries of the Tweed Valley. *Transactions of the Dumfriesshire and Galloway Natural History and Antiquarian Society* (3<sup>rd</sup> Series) 47: 81 – 110
- Rensinck, Eelco. 2002. Late Palaeolithic Sites in the Maas Valley of the Southern Netherlands: Prospects, Surveys and Results. In (editors) Berit Valentin Eriksen & Bodil Bratlund. pp. 181 - 188
- Rust, Alfred. 1937. *Das altsteinzeitliche Rentierjägerlager Meiendorf*. Neumünster: Karl Wachholtz Verlag.
- Rust, Alfred. 1958. *Die jungpaläolithischen Zeltanlagen von Ahrensburg*. (Offa-Bücher, Band 15). Neumünster: Karl Wachholtz Verlag.
- Saville, Alan (editor). 2004. *Mesolithic Scotland and Its Neighbours: The Early Holocene Prehistory of Scotland, Its British and Irish Context, and Some Northern European Perspectives*. Edinburgh: Society of Antiquaries of Scotland.

- Saville, Alan, Torben Bjarke Ballin & Tam Ward. 2007. Howburn, Near Biggar, South Lanarkshire: Preliminary Notice of a Scottish Inland Early Holocene Lithic Assemblage. *Lithics* 28: 41 – 49
- Schmitt, Lou, Stephen Larsson, Jan Burdukiewicz, John Ziker, Krister Svedhage, Jeannette Zamon & Holger Steffan. 2009. Chronological Insights, Cultural Change, and Resource Exploitation on the West Coast of Sweden During the Late Palaeolithic/Early Mesolithic Transition. *Oxford Journal of Archaeology* 28 (1): 1 – 27
- Shott, Michael K. 1993. *The Leavitt Site: A Parkhill Phase Paleo-Indian Occupation in Central Michigan*. (Memoirs of the University of Michigan Museum of Anthropology, No. 25). Ann Arbor: University of Michigan Museum of Anthropology.
- Storck, Peter L. & Betty E. Eley. 1997. *The Fisher Site: Archaeological, Geological, and Paleobotanical Studies at an Early Paleo-Indian Site in Southern Ontario, Canada* (Memoirs of the Museum of Anthropology, University of Michigan, No. 32). Ann Arbor: University of Michigan Museum of Anthropology.
- Suddaby, Ian. 2007. Downsizing the Mesolithic ? The Discovery of Two Associated Post-Circles at Silvercrest, Lesmurdie Road, Elgin, Scotland. In (editors) Clive Waddington & Kristian Pedersen. pp. 60 – 68
- Tipping, Richard. 1991. Climatic Change in Scotland During the Devensian Late Glacial: The Palynological Record. In (editors) Nicholas Barton, Alison J. Roberts & Derek A. Roe. pp. 7 - 21
- Vang Petersen, Peter. 2006. White Flint and Hilltops—Late Palaeolithic Finds in Southern Denmark. In (editors) Keld Møller Hansen & Kristoffer Buck Pedersen. pp. 57 – 74
- Vang Petersen, Peter & Lykke Johansen. 1996. Tracking Late Glacial Reindeer Hunters in Eastern Denmark. In (editor) Lars Larsson. pp. 75 – 88
- Waddington, Clive & Kristian Pedersen (editors). 2007. *Mesolithic Studies in the North Sea Basin and Beyond: Proceedings of a Conference Held at Newcastle in 2003*. Oxford: Oxbow Books.
- Wickham-Jones, Caroline R. 1990. *Rhum: Mesolithic and Later Sites at Kinloch: Excavations 1984-86*. (Society of Antiquaries of Scotland Monograph Series, No. 7). Edinburgh: Society of Antiquaries of Scotland.
- Wickham-Jones, Caroline R. 1994. *Scotland's First Settlers*. London: Historic Scotland.