Recent research at the Broom Lower Palaeolithic site

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The Lower Palaeolithic site at Broom, in the valley of the River Axe on the border between Devon and Dorset in southern England (NGR ST 328025 and NGR ST 326020; Figure 1) has been re-excavated over three seasons between 2000 and 2002. The site is of national significance as it represents the largest single assemblage of Palaeolithic artefacts in south-west Britain, with the stone tools (predominantly handaxes) primarily knapped from chert rather than flint. The fieldwork was undertaken by a team from the Department of Archaeology, University of Southampton. Further details of the excavation project are available at: http://www.soton.ac.uk/~rth1/broom/broom.html and http://www.arch.soton.ac.uk/Research/Aggregates/arch-intro.htm [URLs no longer available, checked 2018]

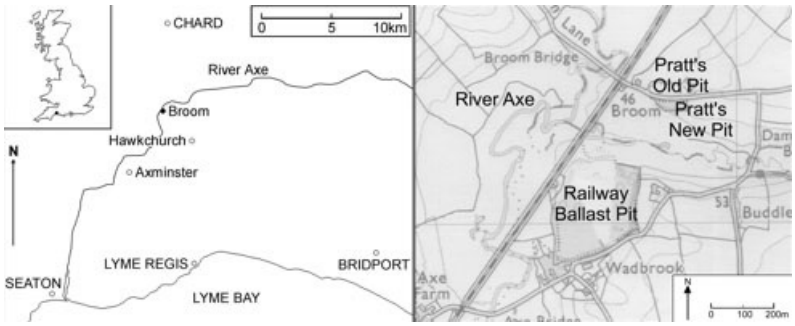


Figure 1. *Location of the Broom Palaeolithic site, Devon and Dorset, UK*
(partially reproduced from 1997 Ordnance Survey map (Explorer 116) with the permission of the Controller of Her Majesty's Stationery Office, Crown Copyright NC/03/18641).



Figure 2. *A chert handaxe from the Broom assemblage.*

15 small sections were dug to relocate a handaxe horizon suggested by Shakesby & Stephens (1984: Fig. 2), provide fine-grained sediments for optical dating techniques, and record horizontal and vertical micro-variations in the Middle Pleistocene fluvial sedimentary sequence at Broom (lower gravels > middle beds >

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upper gravels).

Initial results from four optical dating samples suggest that the site's fluvial sediments were deposited between 270,000 and 250,000 years BP, towards the end of marine isotope stage 8 (MIS-8) (Hosfield *et al.* in prep). These dates are of particular interest in light of the paucity of Levallois artefacts in the Broom assemblage, compared to the relative abundance of the technique in the MIS-8 assemblages of the River Thames valley (Bridgland 1996). The relative diversity of flakes and flake tools in the C.E. Bean collection and the detailed field notes and records compiled by Bean during the 1930s (Green 1988) suggests that the presence of only three Levallois artefacts is not due to selective collection. It may reflect limitations in the available raw materials (although finely made chert and flint handaxes are present in the assemblage - Figure 2), localised patterns in tool-making traditions and/or hominid activities, or the precise age of the deposits. Experimental tool replication will be employed to test the first of these possible interpretations.

The dates provide valuable insights into the morphological evolution and geo-chronological history of the Axe valley. The fluvial deposits at Broom have been exposed beneath the modern river level (to a minimum of c.-2m). This raises key questions regarding the depth and location of any younger terrace landforms and associated deposits, the nature of fluvial response in the River Axe valley during the late Middle and Late Pleistocene, and the possible impact of local and regional isostatic processes on the fluvial landscapes of south-western Britain.

The fieldwork failed to re-locate the handaxe horizon mapped at the top of the lower gravels by Shakesby & Stephens (1984: Fig. 2), suggesting that it may be an artefact of the unsystematic collection of handaxes from the site in the late 19th and mid 20th centuries, when the Broom gravel pits were commercially worked. It is emphasised that the presence of the artefact 'levels' in the middle beds, documented by C.E. Bean (Green 1988: Fig. 2), is not disputed. However, the current studies (http://www.arch.soton.ac.uk/Research/Aggregates/arch-intro.htm [URL no longer available, checked 2018]) of the extant assemblage have indicated that the artefacts show greater evidence of fluvial transport than has previously been claimed, and that at least some of the artefacts from the middle beds were not *in situ*. The results of extensive clast fabric analyses suggest that the main agent of transport was a north-south flowing ancestral River Axe, for both the lower and upper gravels.



Figure 3. *Fine-grained laminated sediments (the middle beds), section 14, Pratt's Old Pit, Broom.*

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Figure 4. *Fine and coarse-grained sediments (the upper gravels), section 9, Pratt's New Pit, Broom. Note the erosion surface between the coarse-grained gravels and fine-grained sands.*

The excavated sections exposed all three of the major sedimentary units previously documented for Broom by Shakesby & Stephens (1984) and Green (1988): the lower gravels, middle beds (Figure 3), and upper gravels. However, detailed lithostratigraphic logging in all of the sections also revealed high resolution changes in the fluvial regime and a series of erosion surfaces (indicative of depositional breaks), within each of the three main sedimentary units (Figures 3 & 4). In line with recent studies in fluvial geomorphology (e.g. Vandenberghe 1995, 2002), the sequence at Broom suggests a pattern of short phases of rapid fluvial erosion and sedimentation (linked with both major and minor phases of climatic transition and oscillation), interspersed with longer periods characterised by predominantly quiescent fluvial systems.

The fieldwork has dated a nationally significant Lower Palaeolithic site while also providing new insights and research angles to a series of other questions. The issues currently being addressed include the geomorphological evolution of the River Axe, the evidence for minor climatic transitions in terrestrial sedimentary sequences, and the geoarchaeological formation of the artefact assemblage at Broom.

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