

Placing the archaeology of the Sarah Beck Valley within its palaeoenvironment: an ongoing study into the environmental archaeology of the Furness peninsula- Southern Cumbria.

Over the last year I have been able to carry out a research project to expand the environmental record of an area of the Furness peninsula of Cumbria. This project was intended to form my undergraduate dissertation; but it was also intended as the preliminary work to a larger-scale exploration of the environmental and landscape archaeology of the region.

The aim of the project was to extract environmental data from the area surrounding Page Bank Farm, in the Sarah Beck Valley which runs between Roose and Roosebeck on the southern corner of the Furness peninsula. This shallow valley, created by fluvial activity at the end of the last ice age, has steadily been filled with wetland sediments over the last ten thousand years. These sediments have been relatively untouched by major agricultural activity or post-medieval construction, and are therefore ideal for the provision of detailed and varied environmental data from the Mesolithic period to the present.

With this in mind I set out to begin an environmental characterisation of the valley's environs, and assess the potential types of human activity and interaction with the changing palaeoenvironment over time. To achieve the former a core sample was retrieved and a minor excavation carried out in a field close to Page Bank Farm (NGR SD 24530 68112). Samples were analysed in order to retrieve both sedimentological and palynological (pollen) data from the various layers of sediment.

Sedimentological samples were extracted from the core and analysed to determine differences in particle size, magnetic susceptibility and organic matter at different depths, and thus establish a depositional history of the valley bottom. Eight palynological samples were extracted from the lower 75% of the core and processed. All identifiable species of pollen were recorded and pollen diagrams were constructed. The patterns of vegetation colonisation and the presence of two possible clearance episodes allowed me to provide a rough dating sequence for the sedimentological data, as well as a local vegetation history.

Findings

Using the retrieved data, a hypothesis as to the changing environmental conditions of the Sarah Beck Valley was formulated. The environmental changes in the valley can be characterised in terms of seven distinct phases. Some of these were represented by the sediments in the core sample (phases 4 thru 7), and some were based on wider environmental evidence from the surrounding area (phases 1 thru 3). The dates of these phases are hypothetical. They are based partially on comparison between the palynological data taken from the core sample and information taken from other studies in the region, and partially on correlation between the palaeoenvironments represented by the core's sediments and the known environmental conditions elsewhere in the area over time. The dates are given in terms of broad archaeological periods. The author hopes to obtain radiocarbon dates from various layers of the valley stratigraphy in order to confirm this sequence sometime in the near future.

The numerals represent stratigraphic layers visible within the core sample (*see Table 1*).

Phase 1:

At the end of the last ice age, as the ice sheets retreated southwards towards the sea, a fluvio-glacial river incised the Sarah Beck Valley out of glacial sands and boulder clays. The resulting ridges on either side of the valley may well have been utilised by Mesolithic peoples. The glacial river eventually drained into the sea close to Roose, forming a sand ridge between this new outflow and the head of the Sarah Beck Valley (*see Map 5*). Between this event and the inundation occurring in Phase 2, it is possible that vegetation could have colonised the valley bottom to form peat deposits or woodlands during the Mesolithic period (Tooley, 1974:20-25). Only more substantial coring will clarify this.

Phase 2:

During the Late Mesolithic and Neolithic sea-levels rose, inundating large areas of land which are now represented by Morecambe Bay (Tooley, 1974). The valley bottom was filled with sand eroded from the valley sides, and silts carried by the sea in suspension, and a storm beach was formed on either side (now visible as a raised beach) (Clare, 2000; Evans, 2005:57-58). Wind-blown and marine transported sand accentuated the existing glacial landforms, and buried areas of existing woodland and peat all around the southern peninsula. At this time, arboreal woodland dominated by oak had colonised the Furness peninsula (Oldfield *et al.*, 1963; Hodgkinson *et al.*, 2000:35-39), however any woodlands around the Sarah Beck Valley could have been inundated, and recolonisation hampered by fluvial and marine deposition.

Phase 3:

Further marine incursions during the Neolithic (Tooley, 1974) and erosion of sands from the ridges led to sediments in the valley bottom accumulating to an altitude at which the sea could no longer fully inundate the valley (Clare, 2000; Evans, 2005:57-58). The southern peninsula, by this point, would have become a coastal region; shellfish may have been abundant, and large game animals and water birds would doubtless have grazed the area. Oak-dominated woodland had begun to colonise parts of the valley sides, although occasionally disrupted by marine and wind erosion until later periods. Open-ground indicators such as ferns and flowering plants are abundant in the pollen assemblage. Woodland seems to be sparse, and dominated by hazel and alder.

Phase 4:

For a short period from the late Neolithic to the Early Bronze Age, the valley bottom could have formed a supra-tidal region, which the sea would only occasionally inundate during storms or particularly heavy spring tides during marine transgressions. Silts were deposited during this period. A brackish reedswamp could have formed in this environment, represented by a slight increase of

organic material between **VIII** and **VII**. Oak-dominated woodland continues to establish itself on the valley sides, and open-ground indicators decrease.

Phase 5:

Further rising of the land due to sedimentation gradually led to the presence of less flowing saline water in the valley bottom. The land possibly transformed into a terrestrial mire, rich in organic material (which has since decomposed, although a very slight increase in organic material was detected between **VII** and **VI**). This situation was demonstrated by a steady increase of sand within the silty deposits represented by **VI**, **V** and **IV**, which suggests slightly less deposition of silt from suspension in moving water and more deposition of sand which probably washed down from the valley sides during periods of rainfall. The presence of the organic material within **III**, along with the known increase in rainfall during the Bronze Age (Bell and Walker, 1992:67-72) could suggest that a freshwater reedswamp or similar formed, crossed by a multi-channelled, braided system of streams, the palaeochannels of which can be seen in the fields around Page Bank Farm. Various wild mammals and birds would have occupied such an environment, and potentially domesticated pigs, which can thrive in such conditions. This stagnant wetland could have been present throughout most of the Bronze Age. Oak-dominated woodland would have covered the valley sides across the same period, with other species such as pine, elm, birch, alder and hazel present in smaller numbers; this situation was evident in the pollen diagram and is similar to sequences identified elsewhere (Oldfield *et al.* 1963; Hodgkinson *et al.* 2000:41-43; Wimble *et al.* 2000). At the end of this phase there was a short-lived clearance episode which affected all species of tree. This could correspond to the widespread clearance which has been detected elsewhere in southern Cumbria during the mid-Bronze Age (Hodgkinson *et al.* 2000:46; Wimble *et al.* 2000).

Phase 6:

European climate becomes much cooler and wetter between the Late Bronze Age and Early Iron Age (Bell and Walker, 1992:71-72). Increased precipitation leads to rising water tables in the valley catchment area, and a more pronounced inundation of the valley bottom. This was represented in the core by an increase in percentage silt across **III**, caused by increasing amounts of slow-moving water depositing silt from suspension. The existing reedswamp conditions would have become inundated in places, forming shallow ponds and channels. This situation continues throughout the Iron Age. Fish could have been present in the standing pools during this period, though probably not on a scale large enough to warrant exploitation, especially with the sea nearby. The effects of the mid-Bronze Age clearance were short-lived, and the oak-dominated woodland recovered on the valley sides. Alder thrived shortly after this clearance episode, possibly due to the moister conditions in the area. An alder-carr woodland could have occupied the areas directly adjacent to the wetland valley floor. The local woodland was affected once again in the early Iron Age, when another clearance episode took place affecting all species including the newly established alder. Palynological samples were not taken from the upper 50cm of the core because of the possibility of more recent contamination, and therefore a floral history beyond this point could not be established.

Phase 7:

A combination of various factors led to environmental changes during the medieval period. During the early medieval period, there is a period of warmer, drier conditions in Britain, leading to a slight decrease in water tables (Bell and Walker, 1992:72-73). This possibly led to a 'drying out' of the valley bottom, and thus a drop in the amount of silt deposited by slow-moving water. By around 1200AD, the foundation of Furness Abbey would have led to widespread and intensive forest clearance. This led to an increase in surface run-off and subsequently an increase in the amount of sand washing down from the valley sides (Hodgkinson *et al.* 2000:49). This situation is represented by **III**, where the organic content increases as areas of the valley floor which were previously inundated year-round are colonised by terrestrial and wetland plants on a seasonal basis when water tables dropped. The excavation of drainage works during the medieval and post-medieval periods compounded this situation, leading to the semi-wetland environment which is visible in parts of the valley today. **II** and **I** represent the current soil which is relatively dry during the summer and very wet in the winter months. This soil has probably built up between the late-medieval period and the present. These conditions provide ideal wet-meadows which may be used to feed domesticated animals during the summer months, as well as a variety of water-birds.

Recent work by local archaeologists, along with numerous 'chance finds' from the last century has presented us with a broad cultural assemblage from the valley and its surroundings. I compared this information with the results of my initial environmental characterisation and produced a narrative of potential human activity and interaction with the landscape in the area from the Neolithic to the medieval period.

Table 1: Summary of identified stratigraphic layers within the core sample

Layer	Average depth from surface	Colour (Munsell system)	Texture (as per particle size analysis)
I	0 – 10.5 cm	7.5 YR: 4/3 (Brown)	Sandy Loam
II	10.5 – 20.75 cm	GLE Y 1: 3/N (very dark grey)	Sandy Loam
III	20.75 – 95 cm	GLE Y 1: 4/10 (dark greenish grey)	Silt – Sandy Loam (changes across layer)
IV	90 – 116.25 cm	GLE Y 1: 4/10Y (dark greenish grey)	Silt Loam
V	116.25 – 123 cm	GLE Y 1: 4/10GY (dark greenish grey)	Not measured
VI	123 – 140 cm	GLE Y 2: 4/5BG (dark greenish grey)	Silt Loam
VII	140 – 153 cm	10YR: 4/2 (dark greyish brown)	Silt
VIII	153 – 159 cm	5YR: 4/3 (reddish brown)	Silt Loam

Future Work

The initial report, which formed my undergraduate dissertation, forms the basis for an ongoing research project on the Sarah Beck Valley. My research aims to further characterise human interaction with the valley's changing palaeoenvironment by using multiple analytical techniques, and through a detailed survey and archaeological exploration of the landscape. This summer I have already discovered a Bronze Age burnt mound on the valley floor. Over the next year I intend to extract the maximum amount of environmental data possible from this site, while simultaneously carrying out a transect coring survey of the valley. I also intend to obtain carbon dates from various layers of the valley stratigraphy in order to adequately date the sequence.

I am very grateful for the support of the Clare Fell Bursary Fund, it aided my research greatly (namely in the form of transportation costs for a large quantity of mud!) which ultimately resulted in my achievement of a first class honours degree in archaeological science, and the award of the Robert Kiln Prize for Landscape and Aerial Archaeology. I hope that thanks to this initial help my research will continue and enlighten us further as to the environmental archaeology of the Furness peninsula. My sincerest thanks.

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