Channel Tunnel Rail Link

London and Continental Railways

Oxford Wessex Archaeology Joint Venture

Geoarchaeological recording at Cuxton, Kent

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1 INTRODUCTION

Quaternary deposits infilling a dry valley tributary of the Medway Valley and thought to cross the site from west to east, were examined in two monolith samples (forming one sequence) taken from Trench 1071TT. Assessment of the monoliths provided an indication of the landscape processes through which the valley fills (contexts [10], [45] and [32]) had accumulated. The monoliths were described and illustrated according to the geoarchaeological methodology designed for the route-wide scheme. Although no further palaeoecological or sedimentological analysis has been undertaken, a summary of the assessment results is given here.

2 RESULTS

The monolith sequence was taken from the eastern end of the south-east facing section of Trench 1071TT, where the natural stratigraphy dipped down into the dry valley. The profile examined was about 2m deep, with a surface (modern ground level) at *c* 15.5m OD.

The surface of the deposits sampled formed horizontal interfaces, except for the weathered chalk at the base of the sequence, which dipped below the base of the section about one metre east of the sampling location. The weathered chalk ([10]) was sampled at the base of the monolith sequence as *c* 0.10m of white/greyish brown (10YR4/6) chalky rubble in a matrix of chalky mud.

A distinct interface separated [10] from the overlying context ([45]). The basal 0.30m of this context was a compact, brown (10YR5/3), slightly sandy clay-silt with a fine angular blocky ped structure and the ped surfaces coated by carbonate precipitations. It contained frequent pea-grit-like, pellety chalk granules (<5mm diameter), very occasional flint pebbles (<30mm diameter) and frequent snail shells, mostly fragmented, but with occasional whole *Pomatias elegans*. A diffuse interface over *c* 0.10m and marked by an increasingly pale colour upwards, existed between the lower and upper parts of [45]. The upper part of the context was a compact, yellowish brown (10YR5/6) slightly sandy clay-silt about 0.50m thick, with a holey, porous structure. Frequent thread-like carbonate precipitations followed root voids in haphazard orientation, especially in the upper 0.20m of the context, but they became fainter and less frequent downwards. The upper part of context [45] also contained more flint and less chalk than its lower part.

A distinct interface, occurred between [45] and the overlying context ([32]), which was about 0.10m thick and of a similar colour and texture to [45] but distinguished by its much looser structure. No monoliths were taken through the metre of sediment that overly [32] because of its loose and flinty nature. However, field descriptions describe these sediments as comprising a flinty lens at the base of about 0.50m of bedded silt and chalky mud with a further 0.30m of flint-rich silt ([7]) underlying recent topsoil, which was also about 0.30m thick.

3 DISCUSSION

The chalky deposit ([10]) at the base of the sequence probably accumulated as a result of the weathering of the chalk bedrock and its movement downslope by solifluction processes during the periglacial environment of the last cold stage. Similar fine pellety chalk rubble and chalky mud have been recorded elsewhere towards the base of dry valley fills in the Kent area and have been attributed to meltwater deposition during the Younger and Older Dryas Stadials (Kerney 1963; 1965).

The overlying snail-rich layer (the base of context [45]) is likely to represent soil material. The comminuted nature of the shells indicates that this soil may have been transported downslope, probably as a result of soil creep processes, which are likely to have taken place in the Holocene. The darker colour at the base of the context is probably a result of the leaching out of carbonates from the upper horizons of the upslope soil. The soil material was buried by chalkier, coarser and more poorly sorted sediment (the upper part of [45]), which suggests that erosion upslope was progressively cutting deeper into the chalky subsoil.

The carbonate precipitation along root channels in the upper part of context [45] and on ped faces in its lower part suggests that although the context was derived from soil and subsoil material eroded from upslope and redeposited as colluvium, it may subsequently have formed the carbonate enriched 'C_{ca}' horizon of a buried soil that developed at the sampling location. It is likely that the upper horizons of this soil were eroded by the hillwash events that deposited contexts [32] and [7], leaving the carbonate enriched subsoil horizon of the soil *in situ*. This is also implied by shells of *Pomatias elegans* found in context [45], which may be derived from burrowing (as is characteristic of this species: see Kerney & Cameron 1979, 53). The bands of flint that occur higher in the profile would have prevented it burrowing from the present day landsurface, suggesting that the landsurface it was associated with had probably been eroded prior to the accumulation of context [32].

Thus it is likely that an erosional surface (and consequently a hiatus) exists between contexts (45) and (32). Although most of context [32] and context [7] were not sampled, owing to the rubbly nature of the sediment, field observations suggest that these coarse sediments may represent debris fans accumulated during relatively high magnitude hillwash events when rills and gulleys developed on the valley sides and fans of coarse material accumulated at the valley edge. Such processes and deposits are characteristic of arable chalkland slopes of the North Downs today, following winter storms, which erode soil material from sparsely vegetated fields. The silty bands, with occasional flints, which form the upper part of (32) are also likely to represent sediment transported downslope as hillwash.

Human activity (deforestation, cultivation, intensification of farming practices and so on) and especially the coincidence of human activity and severe weather conditions may have been responsible for the erosion and accumulation of colluvium within the dry valley (Bell 1983; Bell & Boardman 1992; Bell & Walker 1992). Recent work (Wilkinson 2003) suggests that the activity that triggered the erosion event represented by colluvium is likely to be of very local origin, with a timing and magnitude that varies between dry valleys, according to the distribution of human activity through space and time.

Thus the record of fluctuating landscape stability recorded in the colluvial sediments sampled, probably provides an indication of the impact and intensity of past human activity on the site itself and immediately upslope. However, no dating evidence was found in the deposits sampled to suggest when the period of (a) moderate landscape instability ([45]); (b) relative stability (the evidence from carbonate precipitations for the subsequent development of a soil in context [45]); and (c) the relatively high magnitude erosion events ([32] and [7]) took place. But recent work on the floodplain of the Medway immediately below the site, as part of the A2/M2 road widening scheme, has suggested that comparatively high impact human activity took place on the valley side (that is, in the vicinity of ARCCXT97) from the early Neolithic period, when thick colluvium containing evidence for cultivation and crop processing was deposited at the margins of the Medway Valley.

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