Chapter 14

Conclusions

The results of the investigation of the archaeology of the HS1 route corridor through the Thames alluvium are significant, not only because of the direct results of the field and laboratory investigations, but also in terms of the success of the project in predicting and identifying the location of areas of human activity within the route corridor. The corollary, the identification of those areas in which human activity did not occur, was also, to an extent, a success within the project context. In general the most detailed investigations were undertaken where the direct impact from construction was greatest, in zones where archaeological potential was considered high and confirmed through preliminary field investigations (eg, Tank Hill Road, Thames Crossing and Ebbsfleet). However, field evaluations (eg, Goresbrook, Rainham and Wennington Marshes) and watching briefs were also carried out in lower priority zones and the results proved either negative or the archaeology recorded was relatively insubstantial. Success within the project was also based and assessed through minimising the risk and impact to the engineering programme and schedule of works.

In all cases the results of the investigation appear to have been positive and beneficial with respect to locating and mitigating archaeology. Furthermore, the investigations had little impact on the engineering programme as all aspects of the work were carefully arranged within the overall programme of works. As a result, it is felt that the methods and approaches to the investigation provide a suitable framework for future projects, particularly large-scale infrastructure projects, where management issues are paramount and where a successful project design will be sensitive, not only to the archaeology, but also the engineering and cost limitations. Indeed, the common goal of archaeology and geotechnical ground investigation is to identify the nature of the sub-surface conditions to ensure that adequate provision is put in place at an early stage in the project. A geoarchaeological approach at an early stage in the construction programme, where direct involvement with the geotechnical team can inform both parties on the nature of ground conditions, was fundamental to success on this part of the route corridor. It should be remembered that the very detailed nature of archaeological investigations can place an archaeological team in a position of holding significant information on ground conditions, at a level of detail rarely available to the geotechnical teams on a project.

Archaeology and the HS1 Corridor

The phased approach to evaluating the archaeological resource, where the distribution of sites was buried beneath significant depths of alluvium, allowed the response to evaluation and mitigation to be both appropriate and justified. The weakness of the adopted methodology lies principally in the difficulties in operating within an environment of deep alluvial stratigraphy in which, without costly and time-consuming trenching impacts on our ability to adequately assess the danger to archaeology buried at depth. A second weakness is also inherent in the strategy of rapid assessment of samples and inadequate 'thought time' between stages. This is, however, a minor criticism of the approach given the nature of the project. With the exception of the works at Thames River Crossing (Swanscombe), the location and nature of the investigation strategy was entirely dictated by the location and nature of the impact. The strategy adopted to investigate the route corridor focused on the likely archaeological signatures and proxy records as they overlapped with a range of engineering impacts.

The ephemeral nature of the archaeological signal (predominantly prehistoric in character), as single artefacts and low density scatters lying within sedimentary units, or more substantial remains resting on buried surfaces (eg, at Tank Hill Road), made its identification unlikely prior to intrusive ground works. In many cases, only a reactive response to the watching brief was possible. Furthermore the geoarchaeological approach was vital for assessing significance of single or low numbers of artefacts as potential indicators of significant human activity. For example, the discovery of a single artefact in a test pit where the artefact lay on a boundary interpreted as representing a former landsurface was given higher significance than a similar artefact lying within a sedimentary context. This contextualisation of the archaeology was facilitated through the early common goal of both the geotechnical engineering side of the project and the geoarchaeological approach:

1. Where the understanding of the landscape at a site specific scale was fundamental.
2. Where this scale of investigation was nested within a hierarchical framework of the regional geology and environment.

3. Where factors such as slope aspect and bedrock geology adjacent to the route corridor may have a profound influence on the nature of processes operating within the route corridor.

For the geotechnical engineers this was necessary in order to design the structure of the route corridor, where it was realised that mapping of the route and its surroundings were paramount to a complete understanding of the likely geomorphological history. For the archaeologists this was significant in order to understand the reasons why a particular site may have been occupied (at a regional scale) as well as understanding site formation and transformation processes (at a local scale).

However, it was not only the remains that were discovered, but also those that were absent, that is an important outcome of the project and of significance to our understanding of the regional occupation of the Lower Thames Valley. The ability to survey and monitor excavations across a broad transect of the floodplain provides support to previous notions of presence/absence within the landscape in terms of sites etc. For example, previous surveys of the floodplain have been relatively limited in scope and where detailed investigation has been undertaken it has been typically restricted to expensive cofferdams or remote investigations (through the application of boreholes), without recourse to ascertaining whether or not archaeological evidence is associated with such sequences. The abundance of archaeological evidence from Ebbsfleet, as well as that of parts of the north bank associated with trackways, contrasts with the paucity of evidence along the HS1 route on the main Thames floodplain. This suggests that use of the floodplain may have varied and that places such as Ebbsfleet may certainly have had some significance. It is also possible that taphonomic processes operate differently in the Ebbsfleet to that of the main Thames floodplain leading to enhanced preservational potential. It is important that these issues are considered in the future in order to aid development control in the region.Currently responses to development impact in alluvial corridor archaeology may be predicated by experience within one area of the floodplain, the results of which are subsequently rolled out across wide tracts of floodplain, but without the empirical data existing to validate such an approach.

Successes of the Project

The overall success of the project can be judged in a number of ways, from both the perspective of increasing our understanding of the evolution of the landscape, but also in terms of testing models and criteria adopted in order to develop a programme of works to investigate the route corridor. The latter is, of course, of particular interest to archaeological practitioners including the curatorial services.

Within the alluvial corridor of HS1 the implementation of the project as designed (URN and URS 1999) had two fundamental principles in order to be judged a success:

1. That the archaeological resource was considered, identified and mitigated in an appropriate way.
2. That the archaeological works did not impede the development programme and cause unacceptable delays to construction.

The evidence presented in this report has demonstrated that the successful implementation of a plan, against an archaeological model that predicted the distribution of the archaeological resource along the route corridor, was achieved. Radiocarbon dates from contexts in which peat bottomed onto uncompressible substrate (Fig 96) indicate that the age/depth model used in the initial project design has been reinforced by the findings of the study. Where the model predicted high potential of archaeological remains, the purposive field investigations produced evidence for human activity (eg, at Tank Hill Road and the Thames River Crossing (Swanscombe). By contrast, those areas of the route corridor deemed of low or no potential did not produce material, either during purposive site investigation or through subsequent watching briefs. In this case, the adopted programme of works was suitable to address the issues that arose during construction. Predicting the location of archaeological remains is significant because of the way in which this will focus attention on particular areas of the landscape in future investigations along similar tracts of the landscape. Hence, the discovery of nearly all major concentrations of archaeology in association with floodplain edge environments, topographic highs overlooking wetlands and dryland/wetland interfaces, substantiated our hypothesis, particularly where we were also able to view those areas thought to be of low potential away (eg, Ripple Lane Portal, Thames River Crossing (Swanscombe).

The approach adopted also caused minimal delay to construction because areas of high archaeological potential were identified early in the development programme and were flagged up for investigation. This was particularly the case with Thames River Crossing (Swanscombe), where a costly cofferdam was required in order to allow excavation to take place to the depth at which archaeology might be expected.

Lessons for the Future

It is clear from the strategy adopted that the designed programme of works successfully integrated the archaeological investigation within the design and build framework of the HS1 construction. This worked well because at all stages of the project the adopted strategy was flexible enough to cope with changing engineering constraints and new opportunities for investigation through the lifetime of the project. Commencing in 1994 the field time duration of 10 years or more from start to finish was impacted on by new technologies and indeed new insights regarding the nature of both natural environmental change within the region as well as human in the Thames Estuary and southern England (Cotton and Field 2004). The success of the project involved the implementation of a route-wide review of the archaeological potential integrated with site by site investigation of areas of impact. The basis for this approach operated within a standardised, route-wide approach to investigation but where an overview of the context of all discoveries was maintained by participant staff. This included adopting and managing the methods and techniques used in a flexible fashion depending on ground conditions and engineering necessities. Furthermore a hierarchical framework was successfully adopted where the methodology and results could integrate with and be tested by further geotechnical investigations, archaeological purposive investigations or observations/recording made. The methods used maximised information gain, minimised costs, and specifically targeted information unavailable at the start of the project (as required for evaluative purposes). This was continued into the assessment phase of the project where a shift from assessment to analysis was simplified in order to reduce costs and reporting between stages.

Among the outcomes from the project a number of issues have been forthcoming that perhaps should be considered in the future:

1. Transitions. We have targeted transitions within the floodplain for investigation here and these are likely to have been important tipping points in the landscape that would have impacted on human activity significantly in the past. Further investigation is needed of these at a site specific scale in the future. Particular focus should be put on the timing and speed of transitions as well as the precise nature of those transitions.
2. Full sequence investigation. The variability in environments of deposition associated with the minerogenic sediments (typically clay/silts) suggest that in order to consider resource distribution within the estuary rather than focusing on peat stratigraphies, full sequence characterisation should routinely be undertaken. Furthermore the demonstration that archaeology is associated with a wide range of sediment types rather than simply peats (Fig 10) reinforces this approach.
3. Development control. The spatial variability in evidence for human activity in the floodplain appears to suggest that humans in the past were using the floodplain in different ways at different times. Consequently, our response to development in different parts of the floodplain should vary. At present models from localised areas are used to inform strategies in other parts of the floodplain which may not be justified. Further research into spatial variability in human activity should be undertaken to clarify these issues.
4. Methods and techniques. Some of the approaches used in this study were novel within British archaeology when implemented in the middle 1990s (eg, use of CPT data and some of the geophysical techniques) but are now, if not routinely used, at least available to projects. It is important that new methods and techniques for investigating the subsurface are adopted and tested against future projects (eg, HS 2).