

# Chapter I

## Introduction

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### ARCHAEOLOGY AND HIGH SPEED 1

High Speed 1 (formerly known as the Channel Tunnel Rail Link) was built by London and Continental Railways Ltd between 1996 and 2007, after securing the necessary parliamentary enabling bill, the Channel Tunnel Rail Link Act 1996. This required due account to be taken of its environmental impact, including appropriate mitigation of any archaeological impact. This new high-speed line, henceforth 'High Speed 1' or HS1, extends for 109km across south-east England between St Pancras station in London and the entrance to the Channel Tunnel near Folkestone (Fig. 1.1a). It was built in two sections: Section 1 lies entirely within Kent and extends from Folkestone to Fawkham Junction (Gravesham), just south of the new Ebbsfleet International station, located in the Ebbsfleet Valley, north-west Kent (Fig. 1.1b). Section 2 extends from the Fawkham Junction to London St Pancras, entering the Ebbsfleet Valley under Pepper Hill, crossing under the Thames between Swanscombe and Purfleet, and then passing through Essex and East London.

A major programme of archaeological investigation was undertaken to mitigate the impact of engineering and construction work on the archaeological resource along the HS1 route. Desk-based assessment and route planning commenced in the early 1990s, followed by an extensive programme of evaluation comprising field-walking, trial-trenching, deep test-pitting and borehole investigations, largely undertaken between 1997 and 2001. Archaeological sites that were revealed, and which could not be avoided or preserved *in situ*, were then excavated in advance of construction. In addition to targeted excavations, watching briefs were maintained during construction along the full route of the line, and on any associated works. Any additional remains thus revealed were also recorded, and incorporated in the subsequent analysis and reporting programme.

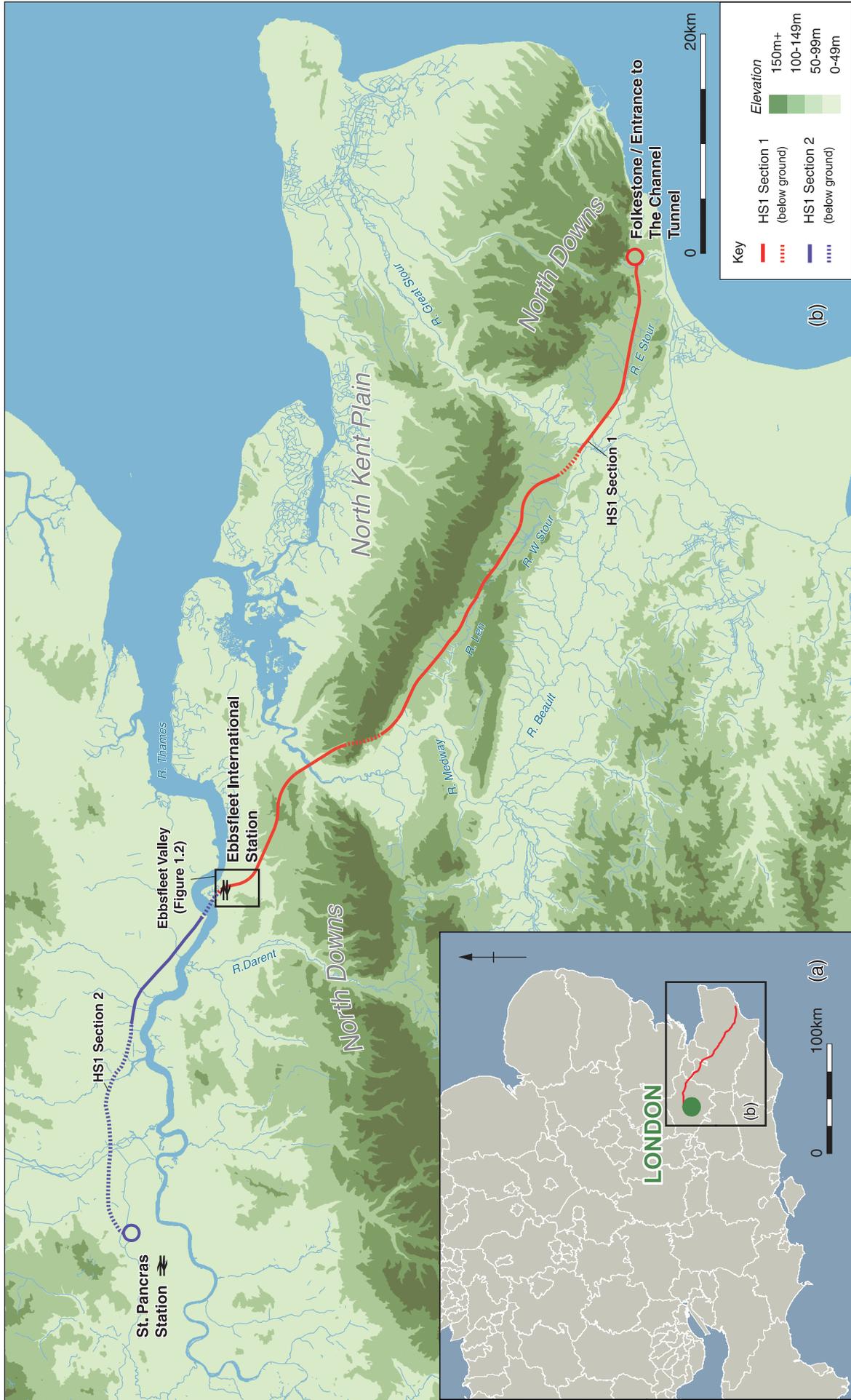
The scale of the archaeological programme was so great that results were not quickly produced, but, at the time of writing (in October 2012) many of the research archives from individual investigations have been lodged with the Archaeology Data Service, where they are directly available for on-line perusal by all interested parties. In addition several monographs have already been published or are in final stages of production, covering significant discoveries along the HS1 route, particularly *On Track: the Archaeology of High Speed 1 in Kent* (Booth *et*

*al.* 2011). This includes major discoveries such as a Neolithic house at Whitehorse Stone, a Roman villa at Thurnham and an Anglo-Saxon cemetery at Saltwood Tunnel. Also recently published is *Settling the Ebbsfleet Valley* (Andrews *et al.* 2011a; 2011b; Biddulph *et al.* 2011; Barnett *et al.* 2011), a 4-volume series covering the discovery of an Anglo-Saxon watermill, further investigation of a Roman villa/industrial complex and further investigation of the late Iron Age and Romano British temple complex at the top of the Ebbsfleet Valley at Springhead. *Prehistoric Ebbsfleet* (Wenban-Smith *et al.* forthcoming) covers Palaeolithic, Neolithic and Bronze Age investigations in the Ebbsfleet Valley, apart from the Lower Palaeolithic discovery reported on in this volume. A paper covering some additional investigations of the MIS 9 deposits at Purfleet on the north side of the HS1 Thames crossing is in preparation (Bridgland *et al.* 2012).

This volume marks the final major piece of archaeological reporting resulting from the construction of High Speed 1, covering an unexpected discovery made in late 2003 after the remainder of the archaeological programme had been completed. Consequently, the programme of analysis and reporting has lagged behind the other archaeological work. It has also, unlike the other works that were carried out as a joint venture between Oxford Archaeology and Wessex Archaeology, been solely the product of work by Oxford Archaeology in collaboration with the various external specialists involved.

### THE SOUTHFLEET ROAD ELEPHANT SITE: AN UNEXPECTED DISCOVERY

The Ebbsfleet Valley, a tiny south-bank tributary of the Thames in north-west Kent near Dartford (Fig. 1.1b), was a major focus of construction work for HS1. Besides the route itself, additional major impacts were made by construction of the Ebbsfleet International station, its connecting link to the existing North Kent line and associated landscape remodelling and station access routes. Although the Ebbsfleet Valley had previously been subject to extensive aggregate extraction, mostly chalk quarrying, it nonetheless still contained a range of important archaeological remains, from Palaeolithic to Saxon eras, which required mitigating excavations. These investigations took place between April 2001 and March 2003, after which targeted archaeological



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Figure 1.1 (a) Location of the High Speed 1 railway line within south-east England; (b) High Speed 1 Sections 1 and 2, and the location of the Ebbsfleet Valley

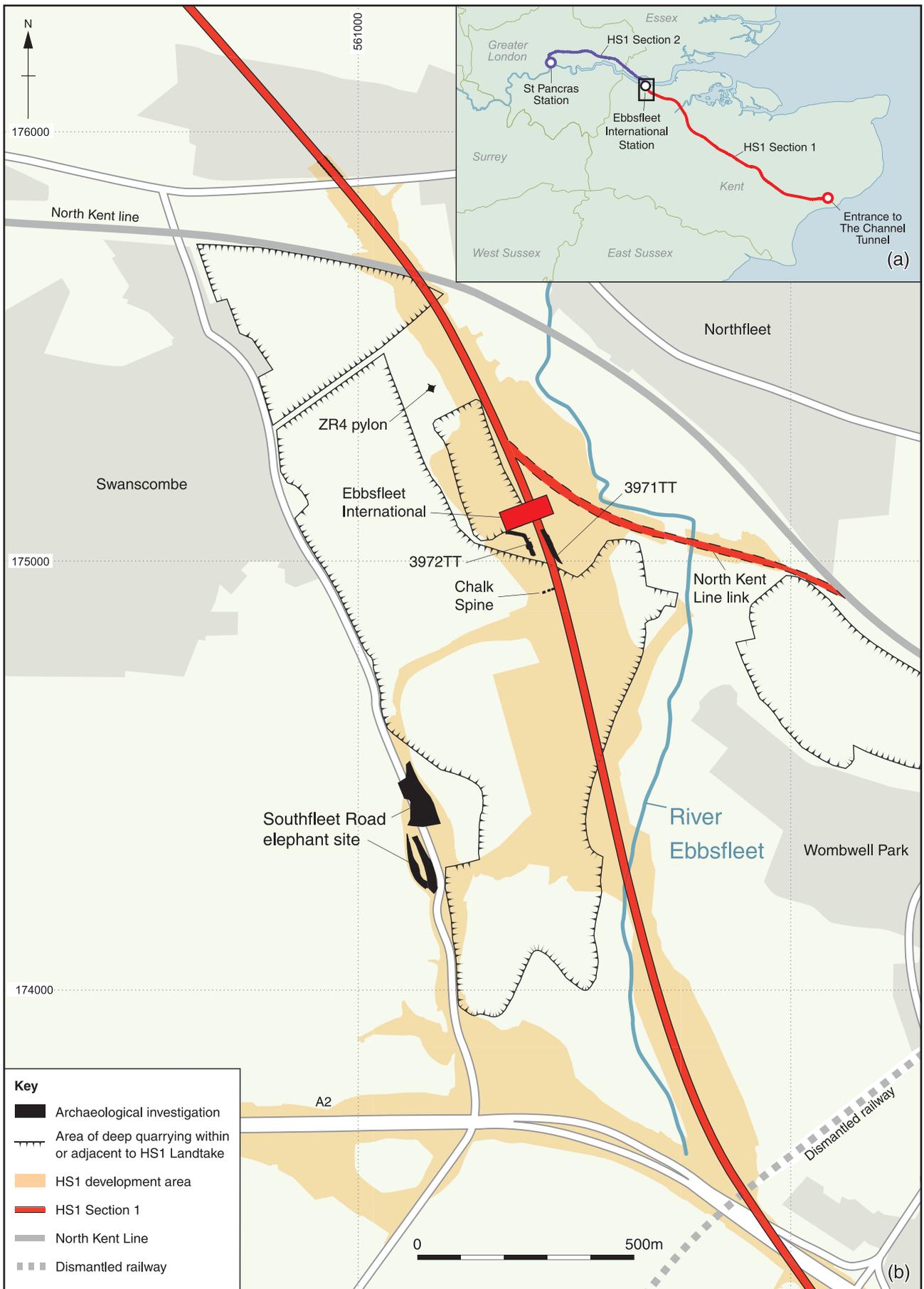


Figure 1.2 (a) High Speed 1, Sections 1 and 2; (b) Location of the Southfleet Road elephant site within HS1 development areas in the Ebbsfleet Valley

fieldwork was considered completed, although a watching brief presence was maintained.

In September 2003, groundwork in the south-west part of the Ebbsfleet Valley, where the access road to the new station was linked with the existing Southfleet Road B259 heading into Swanscombe, exposed Pleistocene gravels in an area not previously considered as of high archaeological potential (Fig. 1.2). Resulting investigation, described in more detail in Chapter 3, led to the discovery not only of the partial skeleton of an extinct straight-tusked elephant *Palaeoloxodon antiquus* associated with an undisturbed scatter of flint artefacts, but also revealed what appeared to be a wider palaeo-landsurface at the same level, containing undisturbed concentrations of lithic and faunal remains. Further investigations then revealed that this horizon was merely one part of a deeper sequence containing artefactual and palaeo-environmental evidence at several different levels.

The find was immediately recognised as of such importance that, even though the archaeological programme was already thought to have been completed, extra resources were made available to carry out a thorough excavation, and the construction programme was rearranged to allow time for this to happen. Excavation took place between February and August 2004, followed by a watching brief through to early November 2004. Consideration was given to preservation *in situ*, but this proved an impossible option in view of the extent to which bulk ground extraction and surrounding construction had already taken place.

## SCOPE AND OUTLINE OF THE VOLUME

This volume focuses specifically on the Southfleet Road elephant site. Other archaeological investigations in the Ebbsfleet Valley in advance of HS1 are reported on in the separate *Prehistoric Ebbsfleet* volume (Wenban-Smith *et al.* forthcoming), which covers Upper Palaeolithic and later prehistoric investigations and the intensive geo-archaeological and palaeo-environmental studies aimed at (a) improving understanding of marine isotope stage (MIS) 7 deposits in the Ebbsfleet Valley, and (b) contextualising within them the prolific evidence of Levalloisian occupation recovered by previous workers since the 1880s.

Although the Southfleet Road elephant site, henceforth 'the site', is less than 1km from the other significant Lower/Middle Palaeolithic archaeological and geoarchaeological locales of the Ebbsfleet Valley, it is a world away conceptually. The site is linked not with the late Middle Pleistocene and Late Pleistocene deposits that fill the central part of the Ebbsfleet Valley and form the focus of the investigations reported in the *Prehistoric Ebbsfleet* volume, but with significantly earlier Middle Pleistocene sediments lining the upper western flank of the Ebbsfleet Valley. These are associated with a wholly different stage of the Pleistocene, and contain Lower/Middle Palaeolithic remains of far greater age, dating over 150,000 years earlier (see Chapter 2).

Furthermore, the nature of the investigation carried out at the site was quite different to the work at the other Palaeolithic/Pleistocene locales in the central Ebbsfleet Valley. Discussed in more detail subsequently (Chapter 3), the work at the site involved substantial open-area excavation and the exposure, recording and sampling of major deposit sequences at a single location. In contrast, the work in the central Ebbsfleet Valley involved excavation and environmental sampling of numerous isolated test pits and stepped trenches, for which subsequent analysis and interpretation required a quite different approach. Thus, despite superficially all coming under the umbrella of 'Palaeolithic and Pleistocene', it makes sense for reporting of the site to be published as a distinct monograph, separate from the other Palaeolithic/Pleistocene investigations carried out in the Ebbsfleet Valley in advance of HS1.

A preliminary, interim report on the site was produced shortly after its discovery (Wenban-Smith *et al.* 2006), which established the initial biostratigraphical basis for attributing the main archaeological horizon with the elephant and associated artefactual remains to MIS 11, the Hoxnian interglacial. This interim report also provided an overview of the stratigraphic sequence, and summarised the technological and typological characteristics of the lithic industry associated with the elephant horizon, attributing it to the core/flake-tool Clactonian.

This volume provides a much more detailed multi-disciplinary report on all aspects of the site. The stratigraphic sequence is described in more detail (Chapter 4), and a revised 11-phase sequence is established, superseding the 6-unit framework presented in the interim report. Results of a range of sedimentary analyses are also presented, namely: micromorphology, loss-on-ignition and magnetic susceptibility (Chapter 5) and clast lithology (Chapter 6).

Faunal and botanical remains including pollen, molluscs, ostracods, small vertebrates and larger mammals were recovered from various horizons throughout the sequence, not only the elephant horizon. More detailed analyses of these remains not only provide a more secure biostratigraphical attribution of the elephant horizon and its associated artefactual remains, but also contribute to a revised reconstruction of the climate and local environment throughout development of the sequence (see Chapters 7-12). This facilitates its integration into the wider chrono-stratigraphic and climatic framework of the Middle Pleistocene.

Two chronometric dating approaches were used to support the biostratigraphical and climatic interpretations. In the first place, recent developments in protocols for amino acid dating, concentrating on opercula of the fluvial gastropod *Bithynia tentaculata*, have provided a new benchmark for dating Middle and Late Pleistocene deposits (Penkman *et al.* 2007 and 2011). Fortunately, *Bithynia* opercula proved to be abundant both at the same horizon as the elephant remains and in another deposit towards the base of the stratigraphic sequence. Thus numerous analyses were carried out on opercula from both horizons (Chapter 13), the results confirming the

MIS 11/Hoxnian attribution for at least the main part of the sequence and also allowing correlations with specific horizons from key comparator sites in other parts of Britain. Deposits above and below these well-dated horizons lacked good dating evidence, so their dates rest on consideration of geomorphological correlations and whether or not there are significant chronological hiatuses above and below the dated middle part of the sequence.

Optically stimulated luminescence (OSL) dating was also applied to a number of horizons in the sequence that lacked any other evidence by which they might be dated. It was not thought that this technique was particularly suitable for deposits broadly attributable to the earlier Middle Pleistocene, but it was intended to investigate whether the upper part of the sequence contained significantly younger deposits above depositional hiatuses. The initial results suggested that this was indeed the case, leading to a second phase of OSL work including analysis of control samples from lower down in the sequence that were confidently attributable to MIS 11. The overall results of this work suggested that, whether solely due to their antiquity or for some chemical or sedimentary reason, the sediments at the site were not providing reliable OSL results. Nonetheless, this work is reported on fully here as a useful case-study for the application of OSL dating to Middle Pleistocene sediments (Chapter 14).

For the lithic evidence of early hominin activity (Chapters 15–21), it is attempted to present not just a technological and typological description leading to an attribution of cultural/industrial affinities, but, where possible, a more holistic approach to lithic analysis. The depositional and post-depositional taphonomic history of the rich assemblage from the elephant horizon is investigated by a combination of spatial distribution, refitting, microdebitage analysis and artefact condition. This leads to interpretation of this level as a palimpsest, with the majority of lithic evidence being a slightly disturbed accumulation, co-occurring with rarer evidence from undisturbed activity episodes, including butchery activity associated with the elephant carcass. Despite a slight degree of disturbance for the majority of the lithic assemblage, it nonetheless has a high degree of integrity. This allows the technological/typological production at

the site to be understood as part of a wider lithic *chaîne opératoire*, within the context of raw material nature and availability, and the manufacture, use and discard of lithic artefacts around the wider landscape in what was evidently a successful adaptation.

Although the great majority of the lithic collection is represented by the rich assemblage from the elephant horizon (Chapters 17–18), lithic artefacts were also recovered from other horizons throughout the sequence, both above and below the elephant horizon. Analysis of the material from these other levels (Chapter 16; Chapters 19–21) establishes a longer history of hominin occupation at the site through MIS 11, as well as perhaps earlier and later, and also demonstrates significant changes in material cultural production and behavioural adaptation during MIS 11.

The final chapter (Chapter 22) presents an integrated summary of the main conclusions reached from the various specialist analyses, with discussion of wider implications within the context of the MIS 11 occupation of Britain and northern Europe. This is followed by some thoughts on Palaeolithic archaeology and mega-development projects, following from what has now been an incredible 20 years of work in the Ebbsfleet Valley since the decision was made in the early 1990s to route HS1 through what was then a quiet post-industrial backwater, with landfilling of the old quarries taking place beside the Blue Circle sports ground. The final section considers the value of this archaeological project, and its legacy.

## ARCHIVES

The artefacts and the primary paper archive from this project will be deposited with the British Museum and the faunal remains with the Natural History Museum, London. The digital archive, including the digital appendices listed under ‘Contents’ will be deposited with the Archaeology Data Service (ADS, 2013), which uses the Digital Object Identifier (DOI) System for uniquely identifying its digital content. The HS1 Ebbsfleet Elephant archive has the following DOI: <http://dx.doi.org/10.5284/1018062>

