The Ebbsfleet Elephant

Excavations at Southfleet Road, Swanscombe

Edited by Francis Wenban-Smith

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Excavations at Southfleet Road, Swanscombe in advance of High Speed 1, 2003-4

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Edited by Francis Wenban-Smith

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Summary

This monograph is one of six volumes resulting from archaeological excavations in the Ebbsfleet Valley ahead of the construction of High Speed 1 and the Ebbsfleet International station. It provides the full account of the discovery, excavation and subsequent analysis of remains from a sequence of rich archaeological horizons found late in the construction programme and dating to early in the Palaeolithic period, or Old Stone Age, associated with the Hoxnian interglacial between approximately 425,000 and 375,000 years ago.

The highlight of this work was the identification of the remains of the carcass of an extinct straight-tusked elephant *Palaeoloxodon antiquus*, surrounded by the undisturbed scatter of flint tools used for its butchery, made and abandoned at the spot. Rich fossil palaeo-environmental remains (including pollen, snails and a wide range of vertebrates: rhinoceros, deer, beaver, rabbit, fish, mice, voles and rare specimens of Daubenton's bat and Barbary macaque) from deposits around the elephant skeleton provide a remarkable record of the climate and environment. They show that the elephant lived and died at a time of peak interglacial warmth, when the Ebbsfleet Valley was a lush densely-wooded tributary of the Thames, containing a quiet, almost stagnant swamp. There is no direct evidence of how the elephant met its end, but it is suggested here that it may well have been hunted and killed by the early hominins of this period, whose survival would have depended upon the nutrition provided by large herbivores such as deer, elephants and rhinos.

As well as about 80 flint artefacts around the elephant skeleton, a much larger concentration of about 1900 artefacts was recovered from the same horizon some 30m away. This was from what may have been a higher and drier spot above the swamp containing the elephant carcass, likely to have been more favoured for activity and where occupational evidence may have been more prone to accumulate. All the lithic remains from the elephant horizon show the same technological approach. Namely the manufacture of flakes from simple cores, and then the selection of some sharp-edged flakes for use, either without further modification, or following a minimal amount of further flaking to facilitate handling or to form simple notched cutting-edges. This approach is known from other sites of the same period in south-east England, and has been called 'Clactonian' after Clacton-on-Sea, Essex, where similar remains have been found. The evidence from this new site provides the best record yet of Clactonian remains from this period, establishing that there was a period early in the Hoxnian interglacial when Britain was re-settled (after local extinction due to the great Anglian glaciation) by hominins who did not make handaxes, generally the typical artefact of the earlier Palaeolithic.

The elephant horizon is overlain by a higher level rich in handaxes of various forms, including sharply pointed specimens, bluntly pointed sub-cordates and twisted-profile cordates and ovates. There are various possible interpretations for this difference, discussed in detail in the volume. The possibility is raised that this great contrast reflects different hominin populations, with the appearance of handaxes later in the Hoxnian relating to a second wave of settlement, possibly even by a different hominin lineage. However, on balance it is regarded as more likely that the development of handaxes later in the Hoxnian reflects *in situ* technological development of one south-east hominin group.

Finally, this monograph provides a fascinating case-study of Palaeolithic excavation methods, and how archaeological work is carried out in conjunction with major infrastructure developments such as High Speed 1.

Résumé

L'éléphant d'Ebbsfleet:
Les fouilles de Southfleet Road, à Swanscombe en amont de la construction de la High Speed 1, 2003–4

Cette monographie constitue l'un des six volumes, résultat des fouilles archéologiques ayant eu lieu dans la Vallée d'Ebbsfleet en amont de la construction de la ligne à grande vitesse High Speed 1 et de la Gare de Ebbsfleet International. Cet ouvrage présente le compte-rendu exhaustif de la découverte, des fouilles et de l'analyse ultérieure des vestiges issus d'une séquence d'horizons archéologiques riches, mis au jour vers la fin du programme de construction. Cette séquence date du Paléolithique inférieur, ou *âge de la pierre taillée*, lié à l'interglaciaire Hoxnian il y a environ 425,000 à 375,000 ans.

Le temps fort de ces travaux est marqué par l'identification des restes d'une carcasse d'un éléphant d'une espèce disparue, le *Palaeoloxodon antiquus* aux défenses droites, découvert au milieu d'un ensemble d'outils en silex disséminés, non déplacés et utilisés pour le massacre du mammifère, objets fabriqués et abandonnés sur place. Des vestiges paléoenvironnementaux riches en fossiles (parmi lesquels du pollen, des escargots et une large gamme de vertébrés : rhinocéros, cerf, lapin, poisson, souris, campagnol et de rares specimens du Vespertilion de Daubenton et du Macaque de Barbarie), livrés par les couches encerclant le squelette de l'éléphant, procurent un remarquable témoignage du climat et de l'environnement d'alors. Ces restes démontrent que l'éléphant vécut et s'éteignit à un moment de chaleur interglaciaire maximale, lorsque la Vallée d'Ebbsfleet était un affluent de la Tamise densément boisé et luxuriant, constitué d'un marais à faible courant, quasi-stagnant. Il n'existe pas de témoignage direct sur la manière dont l'éléphant a trouvé la mort, mais tout porte à croire qu'il aurait été chassé et tué par les premiers hominimes de cette période, dont la survie aurait dépendu de la nutrition que procurent les grands herbivores comme le cerf, l'éléphant et le rhinocéros.

En plus des 80 objets en silex retrouvés non loin du squelette de l'éléphant, une concentration beaucoup plus importante d'environ 1900 artéfacts a été mise au jour dans le même horizon à quelque 30 mètres. Ils provenaient sans doute d'un endroit plus haut et sec au-dessus du marais qui a livré la carcasse du mammifère, emplacement privilégié pour une activité et où des indices d'occupation ont eu une plus grande tendance à s'accumuler.

Tous les restes lithiques recueillis dans l'horizon renfermant les restes de l'éléphant témoignent d'une même approche technologique, à savoir la fabrication d'éclats à partir de blocs uniques, puis la sélection de certains éclats tranchants pour leur utilisation, soit sans autre modification, soit après une légère retouche par débitage pour faciliter leur manipulation ou pour former de simples éclats à coches.

Cette approche est connue sur d'autres sites de la même période dans le sud-est de l'Angleterre et est dénommée « Clactonienne » après Clacton-on-Sea dans l'Essex, où des vestiges analogues ont été mis au jour. Les témoins récupérés sur ce nouveau site forme le meilleur assemblage de restes Clactoniens jamais retrouvé pour cette période, permettant d'établir l'existence d'une période au début de l'interglaciaire Hoxnian qui a vu le repeuplement de l'Angleterre (après l'extinction locale due à la grande glaciation Anglienne) par des hominimes qui ne confectionnaient pas de bifaces, mobilier généralement typique du Paléolithique inférieur.

L'horizon où fut découvert l'éléphant était surmonté d'une couche riche en bifaces de formes variées, dont des spécimens très pointus, des subcordiformes pointus émoussés et des cordiformes et ovalaires à profil torse. Diverses interprétations peuvent expliquer cette disparité et sont détaillées dans ce volume. Il est possible que ce fort contraste entre les approches révèle des populations hominimes différentes, avec l'apparition des bifaces plus tard à la période holsteinienne apparentée à une seconde vague d'occupation, peut-être même par une lignée d'hominimes distincte. Toutefois, tout bien considéré, il y aurait plus de chance que le développement tardif des bifaces dans l'Holsteinien traduise le développement technologique *in situ* d'un groupe d'hominimes du sud-est.

Enfin, cette monographie offre une fascinante étude de cas des méthodes de fouilles du Paléolithique et de la manière dont les travaux archéologiques sont exécutés conjointement au développement d'infrastructures majeures telle que la *High Speed 1*.

Zusammenfassung

Der elephant von Ebbsfleet:
Ausgrabungen an der Southfleet Road, Swanscombe, in Vorbereitung des Baus von High Speed 1, 2003–4

Die vorliegende Monographie ist der sechste und letzte Band einer Reihe, die aus den Ausgrabungen im Tal von Ebbsfleet in Vorbereitung des Baus der Bahnstrecke High Speed 1 und des Bahnhofs Ebbsfleet International hervorgegangen ist. Die Monographie ist der vollständige Bericht der Entdeckung, Grabung und Befundanalyse reichhaltiger archäologischer Horizonte, die in einem späten Stadium der Baumaßnahme ergraben wurden und in das frühe Paläolithikum (Altsteinzeit), der Zeit des Hoxnian-Interglazial vor c 425.000 bis 375.000 Jahren, einzuordnen sind.

Herausragender Bestandteil der Arbeit ist die Identifizierung der Überreste eines ausgestorbenen Europäischen Waldelefanten, Palaeoloxodon antiquus, der von einer unberührten Streuung von Feuersteinwerkzeugen umgeben war, welche zum Schlachten des Elefanten benutzt worden waren. Diese Werkzeuge sind an Ort und Stelle hergestellt und zurückgelassen worden. Reichhaltige fossile paläoökologische Hinterlassenschaften (inklusive Pollen, Schnecken und eine breite Auswahl an Wirbeltieren: Nashörner, Rotwild, Bieber, Hasen, Fische, Mäuse, Wühlmäuse, seltene Exemplare von Wasserfledermäusen, Myotis daubentonii und Berberaffen) aus Schichten um das Elefantenskelett lassen einen bemerkenswerten Einblick in das Klima und die Umwelt zu. Es zeigt sich, dass der Elefant während des Höhepunkts einer zwischeneiszeitlichen Wärmeperiode lebte und starb. Zu dieser Zeit war das Tal von Ebbsfleet ein üppig bewaldetes Einzugsgebiet der Themse, mit einem ruhigen, fast stillstehenden Sumpf. Es gibt keine direkten Hinweise darauf wie der Elefant sein Ende gefunden hat, doch wird hier angenommen dass er von frühen Homininen gejagt und getötet wurde, deren Ernährung und Überleben vom Erlegen großer Pflanzenfresser, wie Rotwild, Elefanten und Nashörnern, abhing.

Um das Elefantenskelett verteilt wurden c 80 Feuersteinartefakte gefunden. Eine sehr viel höhere Konzentration von ungefähr 1900 Artefakten wurde im selben Grabungshorizont, etwa 30m entfernt, entdeckt. Dies war vermutlich um eine höher gelegene und damit auch trockenere Stelle oberhalb des Sumpfes, welcher die Elefantenüberreste enthielt, und wurde anscheinend für bestimmte Aktivitäten bevorzugt. Beschäftigungsspuren haben sich hier vermutlich einfacher angesammelt. Die technische Vorgehensweise bei der Steinbearbeitung ist im gesamten Elefantenhorizont sehr einheitlich. Es handelt sich hierbei um die Herstellung von Abschlägen von einfachen Feuersteinknollen. Von diesen wurden scharfkantige Abschläge ausgewählt, welche entweder unbearbeitet genutzt wurden oder mit minimalem Aufwand weiterbehauen wurden, um eine bessere Handhabung zu gewährleisten oder um gekerbte Schnittkanten zu schaffen. Dieses Verfahren ist von weiteren Fundstellen in Südost-England bekannt und wird als 'Clactonian' bezeichnet, nach Clacton-on-Sea (Essex), wo ähnliche Hinterlassenschaften entdeckt wurden. Die Funde der vorliegenden Grabung stellen die bisher besten Ansammlungen von Clactonian Artefakten dieser Periode dar. Daraus lässt sich ableiten, dass es eine Periode in der Hoxnian-Zwischeneiszeit gab, während der Britannien erneut (nach lokalem Aussterben aufgrund der großen Anglischen Vereisung) von Homininen besiedelt wurde, die keine Faustkeile herstellten – das allgemein typische Artfakt des frühen Paläolithikums.

Der Elefantenhorizont von einer höher gelegenen Schicht überlagert, die mit Faustkeilen verschiedenster Formen angereichert ist. Darunter gibt es spitz zulaufende Stücke, stumpfe sub-kordiale und gewundene kordiale Formen sowie ovale Exemplare. Es liegen diverse Interpretationen für diese Unterschiede vor, die in diesem Band ausführlich diskutiert werden. Mit hoher Wahrscheinlichkeit spiegeln diese großen Unterschiede verschiedene Populationen von Homininen wider. Das Auftreten von Faustkeilen im späteren Hoxnian steht vermutlich mit einer zweiten Siedlungswelle in Verbindung, möglicherweise sogar von Homininen anderer Abstammung. Es ist allerdings wahrscheinlicher, dass die Entwicklung von Faustkeilen im späteren Hoxnian die Entwicklung einer einzelnen Hominingruppe vor Ort darstellt.

Letztendlich ist dieser Band ein faszinierendes Fallbeispiel für paläolithische Ausgrabungsmethoden und für die Einbindung archäologischer Arbeiten in große Infrastrukturprojekte, wie z. B. dem Bau der High Speed 1.

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Bringing to fruition a project on the scale of the Ebbsfleet Elephant excavation has involved literally hundreds of people. Thanks are due to numerous organisations and individuals for their work on the project. It is simply impossible to thank everyone individually, but we are truly grateful to all who have in large and small ways played some role in the project, those named below being only the most directly involved.

Union Railways (North) – latterly High Speed 1 – provided generous funding and support to the archaeological programme, without which the investigation could not have taken place. Josie Murray advised Union Railways on heritage matters and Rail Link Engineering was responsible for managing the design and construction of the railway, including the archaeological programme. Members of the Environment Team, led by Ted Allett and Paul Johnson deserve particular recognition for recognising the importance of the site immediately and negotiating the necessary time and resources for its investigation, in spite of huge pressures to complete the construction programme. Among the archaeological team at Rail Link Engineering, particular thanks are extended to Helen Glass and Steve Haynes for their unstinting support during the fieldwork and post-excavation stages and to Mark Roberts (Institute of Archaeology, UCL) whose role as RLE's specialist external advisor on Palaeolithic matters was also critical in validating the importance of the discovery at an early stage. On the construction side, we are particularly grateful to Jon Gold, the RLE engineer with whom the archaeological team mostly liaised, who had to re-arrange the HS1 and Ebbsfleet International station work programme to accommodate the 6-month excavation programme. Also, to all working on the landscape construction and services in the elephant area, particularly the crew who helped sling and lift the bovid skull found at the very end of the watching brief following the main excavation. Rachel Starling (HS1 Environmental Manager) has subsequently been very patient in supervising completion of the post-excavation analysis and publication on behalf of HS1, while also driving the project firmly to a successful conclusion. As she has pointed out on a number of occasions, this archaeological programme is the last of over a thousand HS1 Project Undertakings to be completed. It was also, to be fair, the last to start.

On the curatorial side, English Heritage (EH) and Kent County Council (KCC) played a vital role as Statutory Consultees on heritage matters, ensuring that Palaeolithic objectives were central to the HS1 research framework for the Ebbsfleet Valley. In particular the project would never have begun without the commitment of Lis Dyson (KCC Heritage Conservation Group) and would never have developed to a successful conclusion without her determined advocacy in the field and post-excavation stages, and thanks are also given to Sharon Thompson and Chris Waite of KCC for their support of the project. Peter Kendall (EH Inspector of Ancient Monuments, SE Region) and Dominique de Moulins (EH Regional Science Advisor) also provided much valuable support and advice throughout the HS1 archaeological project. When the elephant was discovered, early advice indicated that the find was of national significance. Consequently, representations were made by Union Railways, English Heritage and Kent County Council to the Secretary of State for Transport and the Department of Culture, Media and Sport to extend the period available for excavation using the powers available in such circumstances. Accordingly the excavation period was extended and the construction programme amended to accommodate this work. This was the only time that this power was exercised during the whole of the HS1 archaeology programme, in light of the finds' significance. Support from Dartford and Gravesham Borough Councils, Clive Gilbert and Sonia Bunn is also acknowledged in this context.

Oxford Archaeology provided the core field team, as well as project management in the field and post-excavation. From the excellent field team Darko Maricevic is singled out for special mention as the OA site supervisor throughout the excavation and watching brief, and as the first to spot the elephant skeleton when it was uncovered during mechanical excavation. Mary Saunders also deserves a special mention for carrying out so much muddy 'part-sieving' on-site (see Fig. 3.20). We are very grateful to all the Oxford Archaeology excavators, surveyors, finds processors and logistics staff for their hard work on the elephant site: A.Ainsworth, K.Anker, R.Bailey, W.Bedford, R.Blackburn, J.Bolderson, C.Boston, C.Breeden, D.Casey, I.Cook, M.Copley, L.Derry, S.Dobinson, N.Dransfield, N.Gaskell, C.Gerson, M.Gibson, E.Glass, R.Grant, S.Greenslade, D.Harris, R.Hatfield, L.Heatley, R.James, A.Kilgour, A.Kirkpatrick, N.Lambert, S.Laurie-Lynch, M.Littlewood, J.Lord, J.Marchant, L.Martin, A.Mayes, S.Milby, P.Murray, C.Naisbitt, L.Newton, E. Noyce, J.O'Brien, L.Offord, L.O'Gorman, N.Pankhurst, J.Patrick, J.Payne, W.Perkins, S.Pickstone, M.Planas, B.Powell, K.Proctor, R.Radford, C.Rawlings, C.Richardson, C.Sampson, M.Saunders, W.Sawtell, P.Schofield, L.Sikking, M.Sims, M.Sowerby, M.Spalding, A.Stone, R.Tannahill, G.Thacker, D.Thomason, J.Tibber, J.Tierney, G.Walton, R.Whalley, D.Wheeler, M.Wood and M.Wooldridge.

The work of the specialist team on site and in the laboratory is gratefully acknowledged. Martin Bates (Dept. of Geography, University of Wales Trinity St David), Richard Bates (School of Geography and Geosciences, University of St.Andrews), Peter Allen and the late Professor John Hutchinson contributed greatly to the stratigraphic interpretation of the site, Richard being largely responsible for the impressive 3D deposit model. Richard Macphail (Institute of Archaeology, UCL) and John Crowther (Dept. of Geography, University of Wales Trinity St David) worked on the soil micromorphological and soil chemistry studies. Specialist reports were also provided by David Bridgland (University of Durham), Nigel Cameron (Dept. of Geography, University College London), the late Professor Russell Coope, Denise Druce (Oxford Archaeology North), Jean-Luc Schwenninger (RLAHA, University of Oxford), John Stewart (University of Bournemouth), Tom White (Dept. of Zoology, University of Cambridge), John Whittaker (Natural History Museum) and Kirsty Penkman, Victoria Morris and Richard Allen (Dept. of Chemistry, University of York). Simon Parfitt (University College London and the Natural History Museum) led the huge and delicate task of conserving and analysing the faunal remains with crucial assistance from others including: John Stewart, who spent much time on site organising the recovery of fragile faunal remains and bulk environmental samples; Gilbert Marshall, who was involved in excavation of the clay around the elephant and played a major role in the subsequent watching brief; Nigel Larkin who came out at short notice to help conserve and lift the aurochs skull found during the watching brief, and did excellent subsequent conservation work on many of the most important faunal remains. Thanks also to Silvia Bello, Victoria Herridge and the late A.J.Sutcliffe (Natural History Museum) and Richard Hewitt (University of Alcalá (Spain) for their contributions to this report. Glenys Salter (Natural History Museum) is thanked for her invaluable assistance with the day-to-day running of the faunal analysis programme. Silvia Bello and Simon Parfitt acknowledge the support of the Leverhulme Trust and the Calleva Foundation. Silvia Bello's work was part of the Human Behaviour in 3-D project funded by the Calleva Foundation.

Francis Wenban-Smith would particularly like to thank all at the University of Southampton involved in supporting the Centre for Applied Human Origins Research in the Department of Archaeology. During the post-excavation work, key roles in the work carried out in CAHOR were played by: firstly Alison Moore, who, despite being an expert in the Roman period, carried out a huge amount of work washing and marking Palaeolithic flints, entering various records into digital format and typing great tracts of text; secondly James Cole, who constructed the GIS model with the site's faunal and lithic data, and provided a range of graphical outputs and other illustrations; and thirdly Barbara McNee, who produced numerous lithic line drawings of exceptional quality. Various individuals from outside these organisations were involved in the off-site work, in particular Christina Cheung and Christian Lewis, who carried out vast amounts of sample processing.

The British Museum kindly provided working space in the Department of Prehistory and Europe at Franks House for Francis Wenban-Smith during the lithics analysis and have agreed to retain the artefact and paper archives in their collection. Particular thanks are due to Nick Ashton for facilitating this, and to Frank Beresford for his help in curating the lithic collection. Richard Sabin is thanked for providing working space at the natural History's storage facility at Wandsworth. Staff at the Natural History Museum are thanked for greatly facilitating the faunal remains study and kindly agreeing to take the HS1 Ebbsfleet Valley faunal remains into their collection. Digital archive components will be lodged with the Archaeology Data Service.

The specialist team would all like to thank OA South staff including Elizabeth Stafford, (Head of Geoarchaeology), who coordinated the myriad environmental samples, with help from Laura Strafford, variously processing, logging, sub-sampling and distributing them to specialists in an orderly manner. Leigh Allen (Head of Finds) arranged the processing and distribution of artefacts to the specialist team. Other OA staff heavily involved in the post-excavation stages include Leo Heatley who was first involved with the site as an excavator and surveyor, subsequently digitised many of the records and created the initial site archive GIS, and finally turned most of the original illustration briefs into finished figures. Magdalena Wachnik (Head of Graphics) digitised the lithic line drawings and managed the typesetting and printing; Rebecca Nicholson (Head of Environmental Archaeology) produced and copy-edited the monograph in a very short time. Chris Hayden kindly prepared the index. Nathalie Haudecour-Wilks provided the French translation and Markus Dylewski the German translation, with additional input from Susanne Hakenbeck. Bob Williams (OA Chief Operating Officer) and David Jennings (CEO) provided much-needed support and directorial oversight throughout the HS1 project.

Francis Wenban-Smith would like to express especial thanks to the two OA managers with whom he worked throughout the project, firstly Richard Brown who was the project manager during the excavation phase of work, and secondly Stuart Foreman, who managed the project through the subsequent post-excavation analysis and writing-up phases. FW-S would also like to thank family and friends who provided much-needed support throughout the nine year period from the start of this project to its finish, in particular Martin Bates, Laura Coleman, Lis Dyson, Susanne Hakenbeck, Siân Jones, Claire Jowitt, and Mark Roberts.

The managers and staff of Oxford Archaeology, in addition to the people and organisations thanked above, would like to express particular appreciation for the work of Francis Wenban-Smith (CAHOR, University of Southampton) in his various roles as director of HS1 Palaeolithic investigations in the Ebbsfleet Valley, lithics specialist, lead author and general editor of this volume.

In a project with a great many other exciting archaeological distractions, Francis brought to the table an unwavering commitment to, and focus on, the Palaeolithic, without which the elephant site would not have been discovered and this report would never have been completed.

Finally, particular thanks are due to Mark Roberts (UCL Institute of Archaeology), Lis Dyson (Kent County Council), David Bridgland (Dept.of Geography, University of Durham) and Simon Parfitt for their careful reviews of the monograph contents and many pertinent comments. Any remaining errors and opinions are, as is customary, entirely the responsibility of the authors.

Preface

High Speed 1 (HS1) connects Britain to the European High Speed rail network. When Her Majesty the Queen opened High Speed 1 on 6 November 2007 it marked the culmination of Britain's largest construction project, completed on time and within budget. It generated the country's largest archaeological project and created an unprecedented opportunity to excavate along one of the busiest historic corridors between Britain and the Continent, from London and through Kent.

Considerable effort was made in the planning stages of the route to identify important archaeological sites. Where possible they were avoided or preserved in situ. Geophysical survey, field walking and trial trenches were commissioned to provide further detail where there was uncertainty. For sites of interest, an extensive programme of archaeological investigations, analysis and reporting was implemented. Over seventy sites were investigated in this way. A remarkable wealth of information has been gained about the archaeological character and development of the ancient landscapes of Greater London and Kent. The detailed results of the work have been published online through the Archaeology Data Services and subsequently in eight academic books. In addition a book summarising the key sites has also been published, aimed at a non-specialist audience: 'Tracks and Traces, The Archaeology of High Speed 1' (High Speed 1 2011).

The scale of the work required an innovative approach: The RLE archaeology team (HS1's project manager) oversaw all aspects of the archaeology programme. English Heritage, County Archaeologists and university academics were closely involved in setting the High Speed 1 (formerly known as the Channel Tunnel Rail Link) academic research strategy which set the scene for the work. This was implemented within the framework of The Channel Tunnel Rail Link Act 1996 and the project's Environmental Minimum Requirements.

Project managers, planners, design and site engineers, construction, archaeological and historic building contractors, English Heritage, county archaeologists and historic buildings officers came together as one team. It is testament to this team that the fieldwork was undertaken within exacting construction timescales, whilst ensuring that best practice was achieved. Teamwork has been fundamental to the achievements of the project in general and the Southfleet Road Elephant site in particular.

The programme of archaeological fieldwork extended from 1996 until 2004. It was right at the end of this programme, during a watching brief on earthworks associated with the access road to Ebbsfleet International railway station, that the elephant site was discovered. As the HS1 archaeological programme was nearing its end, the subsequent excavation and analysis of the elephant required significant additional resources and adjustment to the access road construction programme to accommodate appropriate excavation and analysis.

This volume is the penultimate report in the series of archaeological monographs describing the HS1 results and records this significant, unexpected and quite remarkable find. It provides a detailed account of the site and its context, followed by thematic analyses of the elephant and associated finds. The detailed analysis presented here has deepened our understanding of the Palaeolithic/Pleistocene in Britain and of the Ebbsfleet Valley in particular. This is clearly an exceptional and major contribution to our understanding of the past within the context of Kent and south-east England, with significance for academic debates at a national and international level.

The extensive assemblage of artefacts and paper records has been deposited at the British Museum and the faunal remains at the Natural History Museum, for future reference. It gives me great pleasure to thank those involved in this latest research and to commend this book to you.

The archaeological programme for HS1 has been recognised nationally in industry awards for setting exemplary standards of archaeological practice. Thank you to all who have contributed to this significant achievement, from the earliest stages of project planning, through the construction programme to final delivery of the monographs.

Rachel Starling,
HS1 Ltd Environment Manager

Foreword

Palaeolithic archaeologists are brought up to expect the unexpected. We take the discovery of hobbit-size homi–nins and undreamt of genetic ancestors from Siberia in our stride. We puzzle over their significance for deep human history. We expect the unexpected because we know that the task of charting the variety of hominin forms and behaviour has barely begun. At a global scale the picture is constantly changing and the results of research challenging. It is therefore re-assuring to dip into one of the best known archives of Palaeolithic archaeology contained in the ancient terraces that once fed into the Thames. The excellence of Quaternary research in southern England has in the last thirty years given us a robust chronology and an environmental framework for studying changing hominin life-ways 400,000 years ago.

This was a period of great importance for deep human history. Hominins now had large brains comparable in size to ours. Yet the products of such brain growth are not readily apparent in new technologies, works of art or even the extension of settlement into inhospitable lands. Instead there seem to be disconnects between brains and behaviour.

In this major addition to the British Palaeolithic archive Francis Wenban-Smith and his multi-disciplinary team of Quaternary scientists show us how to interpret the unexpected. The Southfleet Road elephant site so impressively reported on here is important for three main reasons. It points to the co-operative skills of hominins at this time. The information confirms the Southfleet hominins as top-predators, indeed the only predator able to take down a 45 year old male elephant in its prime and without being sneaky about it by immobilising it in boggy ground. As a result the research challenges the time-honoured link between brains, advances in technology and killing-at-will. It achieves this by verifying the independent chronological status of that most un-remarkable of all lithic technologies, the British Clactonian. And all of this was possible due to excellent preservation, a dedicated team and a well-tried series of development controls that made the work possible.

The results of this work will be discussed and no doubt re-interpreted over many years to come. This volume continues the British tradition of publishing primary Palaeolithic data in full so that this key activity of evaluation and re-evaluation can take place. But the Southfleet Road elephant site has major implications for the protection and future investigation of our deep heritage. The opportunity arose as the result of the major High Speed 1 infrastructure project. No grant body would have funded such a huge speculative trench through the Kent countryside. Previous work had singled out the Swanscombe area as potentially important. But even so, the discovery of this 400,000 year old elephant with flint tools so clearly associated together with rich environmental remains was unexpected and remains remarkable. So remarkable that 2013s much-trumpeted find of a minor English monarch in a car park in Leicester is overblown by comparison.

There are great treasures buried deep in the Pleistocene landscapes of southern England. Sometimes they can be predicted, while in other cases they arise from patient watching briefs in the most unexpected places. I congratulate Wenban-Smith, Oxford Archaeology and the specialist team on a magnificent project, brought to fruition. Its legacy will be to make us all aware of the deep archaeology beneath our feet and inspire us to see more of it in the future.

Professor Clive Gamble,
Centre for the Archaeology of Human Origins,
University of Southampton