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The Essex Society for Archaeology & History

FORMERLY THE ESSEX ARCHAEOLOGICAL SOCIETY

FOUNDED 1852

ESSEX SOCIETY FOR ARCHAEOLOGY AND HISTORY

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ESSEX ARCHAEOLOGY AND HISTORY

The Archaeology of Essex: Proceedings of the Chelmsford Conference

EDITED BY

NIGEL BROWN, MARIA MEDLYCOTT
AND OWEN BEDWIN

THE TRANSACTIONS OF THE ESSEX SOCIETY FOR
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THE ESSEX SOCIETY FOR ARCHAEOLOGY AND HISTORY

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The Society was founded in 1852 as the Essex Archaeological Society. Its objects are:

1. To promote and encourage the study of the archaeology and history of the historic county of Essex.
2. In furtherance of the above, to publish the results of such studies in its journal and to disseminate information on matters relating to archaeology and history in Essex through appropriate media.
3. To organise conferences, lectures and visits for the benefit of members of the Society and interested members of the public; to educate the wider community in the archaeological heritage of Essex; to co-operate with other bodies on matters of common interest and concern.
4. To provide library facilities for Society members and approved members of the public.

Publications

The articles in its journal range over the whole field of local history. Back numbers are available; a list and prices can be obtained on application to the Librarian. Members receive a regular Newsletter covering all aspects of the Society's activities, news of current excavations and fieldwork, and items of topical interest.

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Cover image: Consideration of the way the landscape was used and shaped in the past is a theme which runs through many of the papers in this volume, and the cover image, a reconstruction painting by Roger Massey-Ryan, illustrates this point. It shows the Late Bronze Age (LBA) landscape at south Hornchurch, parts of which were excavated in advance of gravel extraction. In the right foreground is a circular enclosure, in this case with a single large roundhouse. Such enclosures are typical of the LBA in eastern England and many examples of such enclosures are known in Essex. The enclosure is next to, and partly intrudes into, a major trackway running along the side of the valley of the river Ingrebourne. Two roundhouses with areas of arable cultivation lie to the other side of the trackway. A smaller track leads into a large area of open grazing on the gentle valley slopes running down to the river, with alder and other trees growing in the valley bottom. © Essex County Council

Essex Archaeology and History Volume 3 (Fourth series)

The Archaeology of Essex: proceedings of the Chelmsford Conference

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Preface

Nigel Brown

'…we cannot grumble at having occasionally to take our archaeology in county doses. Sometimes, I think, we even gain by such treatment…' Kendrick 1933

This volume presents papers arising from a conference, organised by the Essex County Council (ECC) Historic Environment Branch, and held at the Essex Record Office, Chelmsford in 2008. It was the third conference on the archaeology of Essex to be convened by ECC. The first had been held at Oulton Hall, Clacton in 1978; the proceedings of that conference (Buckley 1980) were a landmark publication, summarising for the first time the archaeology of the county in a single volume and setting out both the context of, and directions for, future research. The Foreword (Marriott 1980) suggested that '….similar conferences held at five year intervals would serve to give direction to…' archaeological work in the county; in fact a second conference was organised, not five, but fifteen years later.

Conferences of this kind are fairly major undertakings for all concerned, and the variety of formal and informal networks involving those working in Essex, and operating at local, regional and national level, are such that there seems no necessity for a large-scale formal conference every five years. However, by the end of the 1980s it was apparent that the 1980 volume, whilst still useful (as indeed it still is) was in many ways outdated. Accordingly a second conference was organised and held in 1993, at Writtle Agricultural College; as with the earlier conference the proceedings were published (Bedwin 1996a). These conferences, besides reflecting a desire for a timely review of the current state of knowledge and understanding, were also driven by a range of changes affecting the way in which archaeological work was carried out.

The 1978 conference was held six years after ECC appointed its first Archaeological Officer. It followed the initial development of the Archaeology Section, during the early 1970s in the wake of the major Local Government reorganisation in 1973, a period when the role of archaeology in the planning process was becoming more structured (Buckley 1996). It was changes to the way in which archaeology operated in the planning system which highlighted the need for a second conference. Planning Policy Guidance note 16 (PPG16) issued in November 1990, transformed the scale of archaeological work driven by the planning process, through the introduction, of pre-determination evaluation, and, more importantly, developer funding. This also had the effect of setting in train the trend which rapidly led to a separation of curatorial and fieldwork roles. With Local Authority archaeologists, in Essex largely working in ECC's Historic Environment Branch, providing an essential curatorial role giving advice on planning and management issues based on a well maintained Historic Environment Record; whilst necessary fieldwork arising from that advice, is delivered by a range of organisations operating on a contracting basis. The rapid growth of fieldwork following the implementation of PPG 16, at a time when Local Government was again being reorganised, meant there was a clear need for an up to date summary of the archaeology of the county together with guidance on research directions for development driven fieldwork (Bedwin 1996b).

The 2008 conference was held at a time when, once again, both the proceedings of the 1993 conference were in need of updating, and changes to the planning system and the delivery of local authority historic environment services, were underway. The 2004 Planning Act introduced Local Development Frameworks and placed considerable emphasis on regional and sub-regional planning; the latter having particular impact in Essex, especially in the south of the county, which formed part of Thames Gateway. At the time that the conference was organised it appeared likely that a new heritage bill would be introduced to parliament; Waugh (2006) provides an interesting contemporary perspective on these developments. At the same time the economic situation was deteriorating, the origins as we now know of a profound recession, still at the time of writing afflicting the UK along with the rest of the world. This economic situation gave impetus for Local Authorities, not least Essex County Council, to review the nature of the services they provide and the manner in which they are provided, a review which necessarily included historic environment services (ECC 2011).

There are some notable differences between this volume and the earlier conference proceedings. Unlike the two earlier publications, not all the papers given at the conference are included here.[1] As it happens the papers which are published here have something of a landscape focus. As a result the present volume could be seen as, if not exactly an update, then an extension of, the book on the origins of the Essex landscape edited by Sarah Green (1999). The present volume has taken rather longer to appear in print than the earlier two, and both previous books were published by ECC (the first as a Council for British Archaeology Research Report the second directly by ECC), whereas the current volume is published by the Essex Society for Archaeology and History (ESAH). In large part these differences are a reflection of the current difficult economic circumstances, although rarely remarked upon, it is truly remarkable that the contributors to all three conferences and subsequent publications, have given their time freely. The present situation, not only the direct financial pressure but the consequent, often radical reorganisations, affecting local authorities, English Heritage, universities and private archaeological contractors, has made such 'unfunded' work extremely difficult. Certainly no blame attaches to the

1 *'A very remote period indeed':Developing a framework for the Essex Palaeolithic and Pleistocene* by Danielle Schreve, David Bridgland and Peter Allen; *Historiography and fieldwork – Mucking 30 years on* by Chris Evans; *The old and the new: characterisation in Thames Gateway and beyond* by Barry Shaw; *Is there anything east of the River Lea? Exploring our industrial past* by David Morgans and Adam Garwood; *From the Thames to the Orwell; monuments to defensive policies 1539–1989* by Paul Pattison; *Essex and the New World* by Stuart Warburton were also presented at the conference.

contributors for the 'later than usual' appearance of this volume, but there is no doubt that the editors have felt and been affected by these pressures, as they prepared the book for publication. The editing of this volume has been undertaken collaboratively, by Maria Medlycott working on behalf of ECC, Nigel Brown working initially on behalf of ECC and latterly ESAH and Owen Bedwin working on behalf of ESAH.

In the length of time between the conference and the publication of these proceedings, the planning context has changed considerably, with the virtual disappearance of regional and sub-regional planning and the recent issuing of the National Planning Policy Framework. Furthermore the reorganisation of the provision of Essex County Council's services has progressed and a new team 'Place Services' came into being in April 2012; bringing together the former historic environment, natural environment, built environment, and landscape services. This structure offers great potential for a more integrated way of working.

Whilst there is no particular reason why the gap of fifteen years between conferences should be maintained, it is interesting to wonder whether a fourth conference will be held in 2023 or thereabouts, and if so under whose auspices the conference will be convened. It is certain that the planning advisory services, currently provided by ECC, will continue to be central both to the conservation and management of the county's archaeology, and, to end this preface as it began with a quotation from T.D. Kendrick, there is equally no doubt that ESAH will have a keen interest in these matters for as long as there are '. . . county archaeological societies (and long may that be!) . . .' Kendrick 1933.

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Foreword

It is a particular pleasure to be able to introduce the following papers, published here in a single volume, for two especial reasons. The first relates to the significant contribution that each of them makes, both individually and corporately, to help update and amplify our understanding of the Archaeology of Essex. Having been presented to those who attended the 2008 conference, they are now rightly available to a wider readership, which our Society has felt it an important and pleasurable duty to facilitate. They can now, on the one hand, be set in context with the papers from the previous conferences published in 1980 and 1996, and on the other, be used to indicate possible future directions of archaeological research in the county.

Of course, advancement in archaeological knowledge has now for many years been much more dependent on random commercial and contractual factors than resulting from critically assessed research criteria. All the more reason, therefore, that regular re-assessments of current knowledge should be undertaken and new lines of study added, not just to highlight recent advances, but also to direct resources towards the subjects that need particular attention. It is also important from time to time to be able to evaluate the effectiveness of the provisions made by local authorities and others for protecting and recording our archaeological heritage in the public interest.

The second reason is a more fortuitous but, none the less, still highly relevant one. In that it is published for 2012, this volume of Transactions marks the 160th anniversary of our Society's foundation as The Essex Archaeological Society. One of the rules adopted at its inaugural meeting, held on 14th December 1852 in the Town Hall at Colchester, stated ''That of the papers read . . . the Council . . . shall select such as it thinks proper for an Annual Publication.'' The first of these papers was a general review of Archaeology (with references to Essex) given on that day by the Rev. J.H. Marsden, Disney Professor of Archaeology in the University of Cambridge. Looking back over the intervening 150 years we can see what great advances of archaeological knowledge have been made about the county, particularly in recent decades.

While the Society has broadened its approach to those articles which it ''thinks proper'' for publication, it still maintains the principle that it should be concerned with the county as a whole. This is reflected in the broad range of subjects covered, and their publication has been dependent on the expertise and dedication of a large number of people. I would particularly like to thank those who have contributed the following papers, and those who have edited this volume.

Mark Davies
President

Starting something new: the Neolithic in Essex

Frances Healy

Much has changed since Robin Holgate's synthesis of the Neolithic and early Bronze Age in Essex (1996). New kinds of information have accumulated, although the distribution of fieldwork continues to be skewed by the concentration of construction and quarrying in certain areas (Fig. 1). Sea-level change and its history are better understood. Chronology overall has become better defined, both from the accumulation of radiocarbon dates and from projects aimed at selecting optimal samples and employing statistical modelling to interpret the results. Aerial photography, especially as part of the National Mapping Programme, has continued to expand the record of unexcavated sites. The concomitant sample excavation of sites identified as Neolithic from aerial photographs has progressed. Both recent and long-finished excavations have continued to be published.

It should be noted that the 1996 paper is written in uncalibrated radiocarbon years, denoted by a lower case 'bc', a convention now abandoned because atmospheric production of radiocarbon has fluctuated to such an extent that it is necessary to calibrate the radiocarbon time scale against a dendrochronological one, the results denoted by 'cal BC'. Apparent differences between the date ranges expressed in that paper and this one are thus exaggerated, although some are nonetheless real.

CAUSEWAYED ENCLOSURES AND CHRONOLOGY

The County Council's generous invitation to speak at the 2008 conference and to write this paper sprang from my involvement in the project *Dating Causewayed Enclosures*, initiated in Cardiff University in 2003 by Alasdair Whittle and Alex Bayliss and funded by English Heritage and the Arts and Humanities Research Council (Whittle *et al.* 2011). These monuments, up to 8 ha in area, are characteristically defined by ditches interrupted by gaps (or causeways) and contain varied and sometimes rich deposits of human bone, food remains, digging implements, artefacts and the debris of their manufacture (Fig. 2). Their size and complexity compared with other features of the earlier Neolithic have provided fertile ground for interpretation and speculation. The project set out to date the monuments more precisely to enhance both their interpretation and a wider understanding of the development of the Neolithic in southern Britain.

The method employed, summarised here because it has been used for the enclosures at Orsett and St Osyth, was the application of Bayesian statistical modelling to radiocarbon dates, described in greater detail elsewhere (e.g. Bayliss and Bronk Ramsey 2004; Bayliss *et al.* 2007a). It is based on the principle that, although calibrated radiocarbon dates accurately estimate the ages of the samples themselves, it is the dates of archaeological events associated with those samples that are important. Bayesian techniques can provide realistic estimates of the dates of such events by combining absolute dating evidence, such as radiocarbon dates, with other information about the samples and their contexts (prior information), thus constraining the probability distributions of individual radiocarbon dates and estimating the dates of events not themselves directly dated but nonetheless located in a sequence of dated samples. An obvious example is the construction date of a particular monument. The resulting 'posterior density estimates' are interpretative, and will change as additional data become available or as the existing data are modelled from different perspectives. They are expressed in *italics* in the text to distinguish them from unmodelled radiocarbon dates. In practice the most commonly employed prior information consists of stratigraphic relationships: if sample B was stratified above sample A and both were contemporary with their contexts, then B must be later than A and a part of each probability distribution is eliminated. The second most commonly employed prior information is the assumption that the events concerned were related. A broadly continuous and uniform phase of activity is therefore applied to counteract the scatter derived from the errors attached to radiocarbon measurements, an effect of which is that, within any group of dates relating to a period of activity, a proportion of the probability distributions will fall earlier or later than its actual span, making it appear to start earlier and finish later than it actually did (Steier and Rom 2000; Bronk Ramsey 2000).

The worth of the method depends on the contemporaneity of sample and context, and hence on rigorous sample selection. Optimal samples are bones found in articulation, in other words still connected by soft tissue when buried and hence not long dead, followed by articulating bones found in proximity to each other, and hence probably not long out of articulation when buried or simply not recognised as articulated at the time of excavation; also preferred are antler implements from the bases of ditches which they had probably been used to dig. The geology of Essex is such that samples of this kind are rarely available, so that a good choice is single charred grains or nuts or single fragments of charcoal from short-lived sources from coherent deposits like hearths of dumps of charred material. The single fragments eliminate the risk of combining material of different ages in the same sample, and the dating of more than one sample from the same context made it possible to check against the inclusion of stray fragments of older material (Ashmore 1999). Also useful are superficial carbonised residues from the interior surfaces of sherds from well preserved sherds, ideally from well represented pots. Internal residues would have derived from food, and hence from recently dead animals or plants; external residues were excluded because they might have derived from sooting which could have included carbon from already old timber or from peat used as fuel. The emphasis on fresh condition and substantial representation is intended to ensure that only a short interval had elapsed between breakage (i.e. final use including the formation of the residue) and burial.

All radiocarbon dates, whether modelled or not, can be assessed by these criteria. When they are applied to the total of over 60 dates listed or summarised in Table 1, less than 40 (half of them from the St Osyth causewayed enclosure) can be interpreted with any confidence as contemporary with

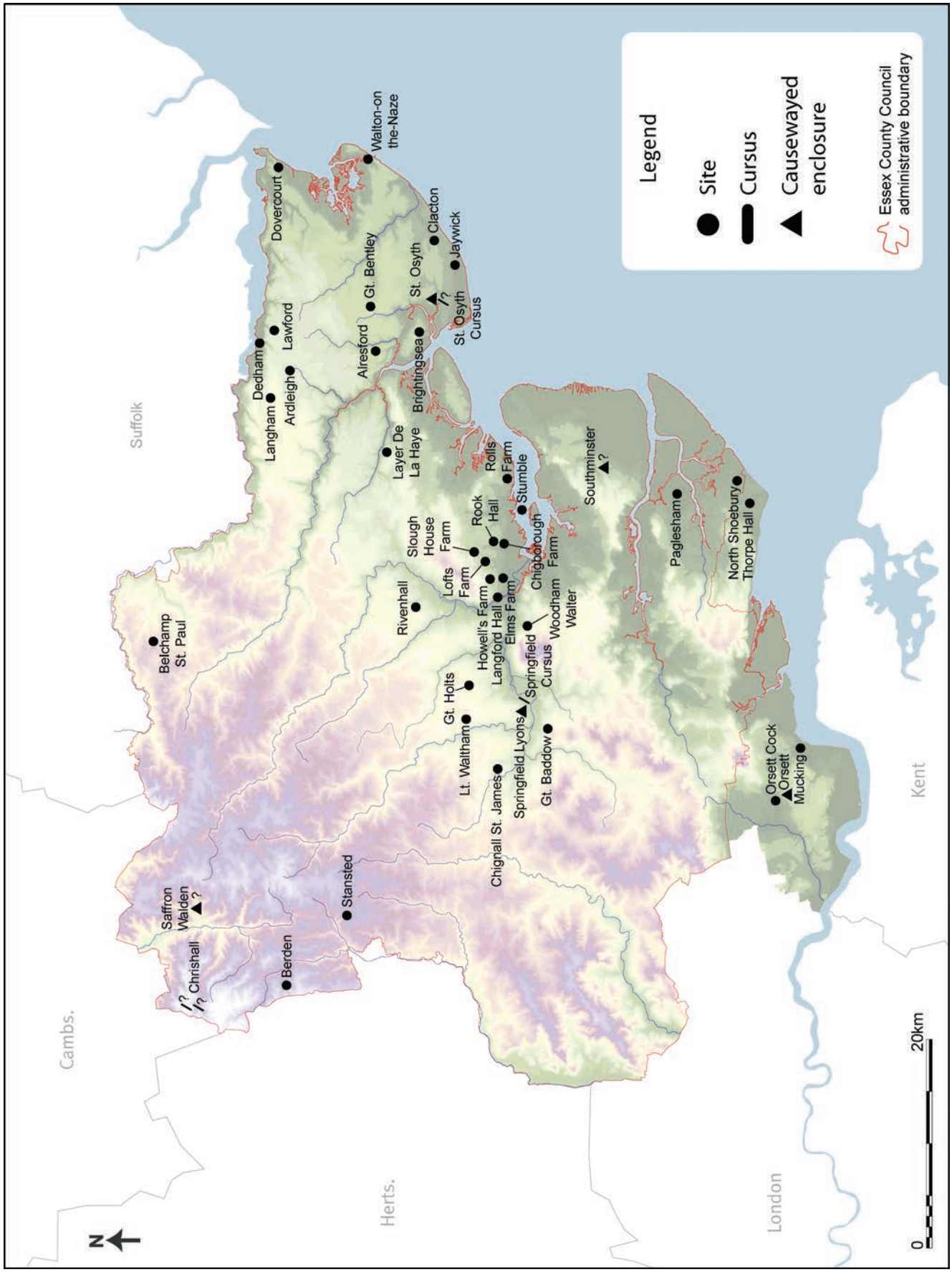

FIGURE 1: Sites mentioned in the text

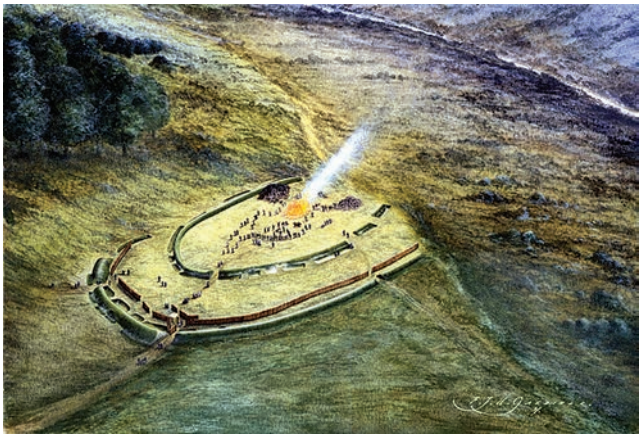

FIGURE 2: A reconstruction of the causewayed enclosure at Orsett, Thurrock. By Frank Gardiner.

their contexts. Many can serve only as *termini post quos* — dates which are older or potentially older than their contexts, because they were measured on samples, such as mature oak charcoal, which was clearly already old when buried, or on bulk samples of charcoal which may have included already old material, or samples from waterlogged wood which may have cut across many growth rings.

The model shown in Figure 3 shows dates for fourth and third millennium cal BC activity in Essex together with those for the early stages of the marine transgression which submerged formerly inhabited surfaces in the estuaries and on the coast. The estuarine and coastal dates are modelled in a single dryland-to-estuarine sequence, to estimate an approximate date for the establishment of fully estuarine conditions in these areas. This seems justified because, while each estuary will have had its individual history, their overall history was similar (Wilkinson and Murphy 1995, fig. 135), resulting largely from rising sea level.

THE START OF THE NEOLITHIC

As elsewhere, Mesolithic and Neolithic sites and artefacts tend, regardless of subperiod, to be concentrated on the same kinds of terrain. In Essex these are river valleys and terraces, low-lying areas that are now intertidal, and the Brickearths of the Southend and Tendring peninsulas (Jacobi 1980, fig. 6; 1996, fig. 1; Hedges 1980, figs 11, 13, 14; Holgate 1996, figs 1, 2, 5). Artefacts of both periods frequently occur not only in the same areas but at the same locations. These reflect repeated and intermittent, rather than unbroken, use of the sites. It seems that locational preferences, and hence some activities, remained similar. One intriguing case is Tank Hill Road, Purfleet (Leivers *et al.* 2007). This local high point at the edge of the floodplain near the confluence of the Mar Dyke with the Thames yielded predominantly late Mesolithic material but was used over thousands of years, on the evidence of lithics dating from the late upper Palaeolithic to the early Bronze Age, in other words up to the time when the site became peat-covered in the late third millennium cal BC (Leivers *et al.* 2007, table 10). All this material was in same horizons in the soft, fluvial sand of the site, illustrating the potential and limitations of old land surfaces. They can preserve features and material which would be destroyed or dispersed by cultivation in unprotected locations, but, at the same time, they remain open contexts, on which the residue of activities of many periods can accumulate until they are finally sealed. At Tank Hill Road, the accumulating material was further homogenised by animal burrowing and root growth. Horizontal distributions remained more coherent, with late Mesolithic microlith manufacture focussed in a dense concentration of burnt and worked flint, including many very small chips indicative of *in situ* knapping. A hearth at the edge of this focus of microlith manufacture might be expected to relate to it, and later fifth to very early fourth millennium BC thermoluminescence dates for three out of four samples of burnt flint from the hearth (Leivers *et al.* 2007, table 2) would fit with the presence of rods among the microliths, since these forms continued to be made and used up to this period in other regions (French *et al*. 2007, 76–79, 280–306; Spikins 2002, 43). Two statistically consistent radiocarbon dates on short-lived charcoal samples from the same hearth, however, fall in the third quarter of the fourth millennium cal BC (Fig. 3: *NZA-27368*, *-27369*). Their consistency makes it improbable that they reflect introduction of later charcoal fragments. It looks as if the late fifth millennium BC burnt flint entered the feature from the massive immediately adjacent concentration of this material (Leivers *et al.* 2007, figs 2, 6). There was activity here towards the end of the fifth millennium, but the hearth dates from hundreds of years later.

Coincidences of location like these may have contributed to Robin Holgate's view of the introduction of Neolithic beliefs and practices '. . . farming was originally practised in Britain by the indigenous hunter-fisher-gatherer populations in the late 4th millennium bc [early fourth millennium cal BC], with a switch from reliance on mobile resources, for example deer and fish, to a dependence on immovable resources, namely cereals and domesticated animals, having occurred by the early third millennium bc [mid fourth millennium cal BC]. . . It is certain . . . that communities using the new styles of pottery and flint implements were present in Essex . . . by the late 4th millennium bc [early fourth millennium cal BC] and that these communities had started to leave permanent features in the landscape in the form of ceremonial monuments during the early 3rd millennium bc [mid fourth millennium cal BC].' (1996, 16).

This chronology can now be refined rather than revised. Robin Holgate's view that monuments, including causewayed enclosures, began to be built only after an initial uptake of domesticates and novel artefacts is confirmed, as is his start date for Carinated Bowl pottery in the early fourth millennium cal BC (1996, 22). An early date for *some* Carinated Bowl is indicated by a date of 4230–3980 cal BC (95% confidence; Table 1: KIA-20157) for a waterlogged oak plank from a burial accompanied by a Carinated Bowl at Yabsley Street, Blackwall, just outside the historical limits of Essex on the west side of the river Lee (Coles *et al.* 2008); this however, applies only if the plank, identified as *possibly* of sapwood, was indeed so. If it was of mature oak the burial itself could have been more recent. The only date associated with the style in Essex, from a pit containing Carinated Bowl pottery at Little Waltham, is modelled as *4010–3260 cal BC* at *92% probability* (Fig. 3: *HAR-1087*). It provides little precision because of its very large standard deviation, although the charcoal may have been close in age to its context, since all of the undated

Site	Laboratory Number	Sample reference	Material	Context	Radiocarbon Age BP	δ13C (‰)	Calibrated date range BC (95% confidence)	*Posterior density estimate cal BC (95% probability)* if modelled	Comment
Bartonhall Creek (Roach 2)	HAR-8645	R2.2	Bulk sample of organic material from deposit	Context 2. Estuarine biogenic deposit with fibrous plant material and some leaf fragments, formed on Head, overlain by estuarine clays (Wilkinson and Murphy 1995, 42–43)	4560±100		3630–2920	–	Date of context because material short-lived
Bradwell-on-Sea (Blackwater 7)	HAR-6604	Bl7.43	Bulk sample of charcoal from assemblage of *Quercus* sp. and *Prunus* sp.	Context 43. Dense spread of charcoal on Head under estuarine deposits, with scant lithics including chisel arrowhead (Wilkinson and Murphy 1995, 86–90; Healey 1995, 116)	3990±70	−24.6	2840–2290	*2860–2810 (4%), 2750–2720 (1%), 2700–2290 (90%)*	*Terminus post quem* for context and for estuarine deposits
Bradwell-on-Sea (Blackwater 8)	HAR-6617	Bl8.32	Bulk sample of *Quercus* sp. charcoal	Context 32. Spread of exclusively oak charcoal on Head under peat, close to context 31 and to two pits containing plain Bowl pottery (Wilkinson and Murphy 1995, 84–90; Brown 1995a, fig. 76: 1–4)	4690±70	−25.2	3640–3340	*3640–3350*	*Terminus post quem* for context and for peat
	HAR-6618	Bl8.31	Bulk sample of predominantly *Quercus* sp. charcoal	Context 31. Spread of predominantly oak charcoal on Head under peat, close to context 32 and to two pits containing plain Bowl pottery (Wilkinson and Murphy 1995, 84–90; Brown 1995a, fig. 76: 1–4)	4000±70	−24.5	2860–2300	*2860–2810 (5%), 2750–2720 (2%), 2700–2300 (88%)*	*Terminus post quem* for context and for peat
Brampton, Cambridgeshire	GU-5264		Unidentified bulk charcoal sample	Pit cutting silted S ditch of oval enclosure (Malim 2000, 90)	3910±70		2580–2150	–	*Terminus post quem* for pit
	GU-5265		*Quercus* sp. charcoal	2nd pit cutting silted S ditch of oval enclosure (Malim 2000, 90)	4140±140		3090-2300	–	*Terminus post quem* for pit
Burnham-on-Crouch (Crouch 23)	HAR-5737		Waterlogged *Crataegus* post	From amorphous setting of brushwood and small posts in lower peat (Wilkinson and Murphy 1995, 58)	3680±70	−28.8	2290–1880	*2290–1930*	Probably contemporary with structure because hawthorn short-lived and post small
Dagenham marshes, Barking and Dagenham	OxA-1721	WAF 3	Formerly water-logged *Taxus* sp roundwood =>30 years growth (Barclay and Bradley 2011, 451–54 ; Coles 1990, 320)	From 495 mm tall carving of human figure found in Dagenham marshes in 1922 (Coles 1990, 320, 326, pl. 29 a & b)	3800±70	−27.0	2470–2030	*2470–2110 (86%), 2110–2030 (9%)*	Probably more-or-less contemporary with manufacture of figure, despite longevity of yew, because object made from roundwood
Eynesbury, Cambridgeshire	NZA-14329	Sample 1580	*Quercus* sp. sapwood charcoal (Ellis 2004, 11, table 16)	5183. Fill of pit 5181, described as blocking N entrance of hengiform ring ditch 2513, the secondary and tertiary fills of which contained plain Bowl pottery (Ellis 2004, 7–13, 63)	4995±65	−23.9	3960–3640	–	Contemporary with context because sample sapwood
Gorhambury, Hertfordshire	HAR-3484	GORH 1715	Bulk sample of mature *Quercus* sp. charcoal	1715. One of 5 slots, all packed with clay and containing charcoal, defining a rectangular structure 7 m wide and >9 m long. In 1715 the charcoal ran along the outer edge of the slot, there were sherds of plain Bowl and, in the upper fill, and daub fragments. The 5 slots together yielded 18 pieces of struck flint including blades (Neal *et al.* 1990, 7–9, 175–6; 218–21)	4810±80	−25.6	3760–3370	–	*Terminus post quem* for structure

Harwich (Dovercourt 2)	HAR-8876	D2.3	Bulk sample of mature *Quercus* sp. charcoal	Context 3. Dense charcoal spread, including intact charred oak branches, on old land surface under clay (Wilkinson and Murphy 1995, 14–16, 88–90)	4020±70	−26.1	2870–2340	*2870–2800 (8%), 2760–2340 (87%)*	*Terminus post quem* for context
Hullbridge (Crouch site 4)	HAR-5226		Peat	Base of lower peat, overlying early and late Mesolithic lithics, formed on Head, near start of development from wetland to fen woods (Wilkinson and Murphy 1995, 35–42, 62–67; Healey 1995)	3760±70	−30.0	2460–1970	*2290–2010*	Contemporary with context because peat itself dated
	HAR-5223		Waterlogged wood	Surface of lower peat, at contact with middle clay (Wilkinson and Murphy 1995, 35–42, 62–67)	3660±70	−28.0	2280–1880	*2200–1910*	*Terminus post quem* for context because nature and source of wood unknown
Jaywick (Clacton 1 = Warren's Clacton area 2)	HAR-8154	Cl1.5	Unidentified bulk charcoal sample	Context 5. Fill of pit (context 1) containing Beaker sherds including substantial part of profile of globular, probably S-profiled ('E Anglian') vessel, struck flint, fired clay, charred cereal and burnt animal bone (Wilkinson and Murphy 1995, 102–104)	3830±90	−24.9	2550–2030	*2560–2530 (1%), 2500–2150 (94%)*	*Terminus post quem* for context
	BM-172		Unidentified bulk charcoal sample	Site 11. From pit containing Beaker sherds with 'barbed wire' and fingernail-rusticated decoration, one possibly of globular profile, collected by Hazeldine Warren (Barker and Mackey 1968)	3750±150		2580–1740	*2840–2810 (1%), 2670–2110 (94%)*	*Terminus post quem* for context
Little Waltham	HAR-1087	LW71251-1	Bulk charcoal sample. Undated remainder identified as *Corylus/Alnus* sp by Rowena Gale (English Heritage files)	Pit 251, containing Carinated Bowl pottery. One of only 3 certainly or possibly Neolithic features on N periphery of extensive excavated area (Drury 1978, 10–11, 51, 118, figs 7, 36)	5120±130	−25.4	4260–3640	*4030–4020 (1%). 4010–3620 (92%). 3590–3530 (2%)*	Could be date of context if all of original sample short-lived and from single source
Lodge Farm causewayed enclosure, St Osyth	19 dates on charred hazelnut shell (2 from a recut of a ditch segment, 17 from pits) and 3 on carbonised residue on the interior of sherds (from pits), modelled to estimate a start date of *3670–3630 cal BC (61% probability)* or *3570–3540 cal BC (34% probability)*; an end date of *3640–3610 cal BC (61% probability)* or *3560–3530 cal BC (34% probability)* and a use-life of *1–40 years (95% probability)* (Hamilton *et al.* 2007)								
Mar Dyke bridge piers, Thurrock	HAR-4523	575cII	Waterlogged wood	Layer 8, at −3.62 m OD. Lower part of peat layer in channel, yielding a predominantly freshwater diatom assemblage and some charcoal. 0.31 m below sample was start of local pollen zone MD2, which showed elm decline, general decline in tree taxa, increase in grasses, appearance of cereals and *Plantago lanceolata*. Followed by woodland regeneration in MD3 (Wilkinson 1988, 103–109, 123–125; Scaife 1988)	4650±90	−27.90	3640–3100	*3640–3270 (82%), 3250–3100 (13%)*	*Terminus post quem* for context because composition, maturity and derivation of wood unknown
Maylandsea (Blackwater 3)	HAR-6623	Bl3.41	Waterlogged *Quercus* sp. stool	Context 41. Rooted in head below estuarine sediments (Wilkinson and Murphy 1995, 19–22)	4190±80	−26.2	2930–2500	*3020–2970 (1%), 2960–2560 (91%), 2540–2490 (3%)*	Tree would have died as conditions became increasingly wet. Sample may have included older as well as younger rings and may thus be a *terminus post quem* for death of tree
Mucking	HAR-450	AML-727181-786	Bulked sample of partly humified *Quercus* charcoal	Grave 786. From plank-built coffin surrounding body stain accompanied by two barbed and tanged arrowheads (Jones and Jones 1975, 140–41; Clark 1993, 35)	3580±90	−23.4	2200–1690	–	*Terminus post quem* for burial

Site	Laboratory Number	Sample reference	Material	Context	Radiocarbon Age BP	δ13C (‰)	Calibrated date range BC (95% confidence)	*Posterior density estimate cal BC (95% probability)* if modelled	Comment
Old Parkbury Farm, Colney Street, Hertfordshire	OxA-3301	F89.77	*Quercus* charcoal	From charred, hollowed oak trunk 5.3 m long and > 1m across containing cremated human bone (Hedges *et al.* 1994, 354; Niblett 2001, 157–62)	5080±75	−26.0	4040–3700	–	*Terminus post quem* for structure and burial
Orsett causewayed enclosure, Thurrock, construction and initial use	6 measurements on unidentified bulk charcoal samples and one on carbonised residue from the interior of a sherd modelled to estimate construction dates for the entrance in the palisade of *3520–3325 cal BC* (*94% probability*) or *3215–3190 cal BC* (*1% probability*), probably *3490–3395 cal BC* (*44% probability*) or *3390–3355 cal BC* (*22% probability*); and of *3520–3365 cal BC* (*95% probability*), probably *3450–3370 cal BC* (*68% probability*) for the inner ditch and bank (Whittle *et al.* 2011, 359–61)								
Orsett causewayed enclosure, Thurrock, later activity	BM-1380	1731/CF4 IV (5)	Unidentified bulk charcoal sample	Area C, F4, IV, layer 5. Middle silts of N butt of S segment of inner ditch, which contained Grooved Ware (Hedges and Buckley 1978, figs 7, 13)	3871±62	−23.5	2550–2140	*2550–2540 (1%), 2490–2190 (92%), 2180–2140 (2%)*	*Terminus post quem* for context
Rolls Farm, Tollesbury (Blackwater 18)	HAR-7060	Bl18.90	Bulk sample of mature *Quercus* sp. charcoal	Context 90. Scatter of mature oak charcoal on old land surface under peat, close to dense scatter of early Neolithic lithics and pottery (Wilkinson and Murphy 1995, 47–49, 71–76; Holgate 1995, 124–126, Brown 1995a, fig. 77)	4180±70	−23.7	2920–2500	*2910–2570*	*Terminus post quem* for context
	HAR-7056	Bl18.91	Waterlogged *Quercus* sp. bole	Context 91. Oak tree bole rooted in old land surface and extending into base of peat , close to dense scatter of early Neolithic lithics and pottery (Wilkinson and Murphy 1995, 47–49, 71–76; Holgate 1995, 124–126, Brown 1995a, fig. 77)	4030±80	−28.4	2880–2340	*2880–2400 (92%), 2390–2340 (3%)*	*Terminus post quem* for death of tree and growth of peat
Purfleet (Thames 2),Thurrock	HAR-8647		Waterlogged tree roots	At base of peat bed overlying a soil formed on estuarine sediments and containing roots and drifted trunks of ash, alder, yew and other trees (Wilkinson and Murphy 1995, 90–98)	3910±70	−30.20	2580–2160	–	*Terminus post quem* for context because not rooted and possibly drifted from elsewhere
Springfield cursus	HAR-6266		Unidentified bulk charcoal sample	Area G, segment 344, context SB84 1703. Charcoal-rich deposit in top of NW ditch of cursus, containing small, abraded Grooved Ware sherds (Buckley *et al.* 2001, 112, fig. 11: section A–A')	3990±80	−24.70	2860–2280	*2870–2800 (5%), 2760–2280 (89%), 2250–2230 (1%)*	*Terminus post quem* for deposit HAR-6266, -6268 and -6271 are statistically consistent (T'=2.3; T'(5%)=6; ν=2)
	HAR-6268		Unidentified bulk charcoal sample	As HAR-6266	3960±80	−26.1	2840–2200	*2850–2810 (2%), 2700–2200 (93%)*	As HAR-6266
	HAR-6271		Unidentified bulk charcoal sample	As HAR-6266	4120±80	−24.9	2900–2470	*2890–2550 (88%), 2540–2490 (7%)*	As HAR-6266
Stansted Airport, M11 site	NZA-23238		cf Maloideae charcoal	Treethow 420068, context 420069. Containing early Neolithic lithic assemblage (Cooke *et al.* 2008, 20; Cramp 2008, 24.8)	3947±35	−24.9	2570–2340	*2570–2300*	If date is accurate, then either the sample was intrusive or the lithics were redeposited
Stansted Airport, Mid Term Car Park site	NZA-20918		Single fragment of *Corylus* charcoal	Pit 323037, context 32306. Charcoal-rich deposit among series of reddened layers of burnt soil. Lithics of Neolithic character. 4 abraded flint -tempered sherds in same layer as sample (Cooke *et al.* 2008, 25)	4883±35	−25.36	3710–3630	*3760–3740 (2%), 3720–3630 (92%), 3560–3540 (1%)*	Taken as date for context because sample short-lived
	NZA-20960		Single charred *Corylus* shell	Pit 344278, context 344279. Earliest fill of pit with small amounts of badly preserved animal bone and cereal, much charred hazelnut shell and struck flint. Overlain by charcoal-rich deposit, in turn	4741±35	−24.41	3640–3370	*3640–3490 (73%), 3440–3370 (22%)*	Taken as date for context and pottery because sample short-lived and refits between fills indicate common source

				overlain by finds-rich backfill including 98 plain Bowl sherds and much struck flint. 8 short refitting sequences within blade-based industry, both within and between fills (Cooke *et al*. 2008, 25–26)				
Stow Maries (Crouch 8)	HAR-5227	C8	Waterlogged tree roots	From extensive exposure of fallen trunks and *in situ* tree stools, including oak and alder, in surface of peat deposit under clay (Wilkinson and Murphy 1995, 28–32)	4100±70	−30.6	2890–2470	*2880–2550 (87%), 2540–2490 (8%)*	*Terminus post quem* for death of tree(s) and deposition of clay
Tank Hill Road, Purfleet, Thurrock	NZA-27368	8522	*Alnus glutinosa* charcoal, 'young wood'	Trench 3985TT, hearth 8550001, context 8550002. Main fill (much burrowed and rooted) of hearth cut into fluviatile sands and sealed by late third millennium cal BC peat. (Leivers *et al*. 2007). At edge of dense concentration of burnt and struck flint, including the debris of microlith manufacture.	4642±30	−27.4	3520–3350	*3520–3360*	Statistically consistent with NZA-27369 (T′=0.1; T′ (5%)=3.8; ν=1); inconsistent with 3 statistically consistent TL dates on burnt flint from same context, with a weighted mean of 5310–4040 BC (95% confidence). A 4th TL date was 10290–6680 BC (95% probability)
	NZA-27369	8522	*Corylus avellana* charcoal, 'young wood'	As NZA-27368	4657±30	−27.0	3520–3360	*3520–3360*	As NZA-27368
The Stumble, Goldhanger (Blackwater 28)	OxA-2298	BL 28C.270	Charred hazelnut shell	Area C, posthole 269, context 270. Contained charcoal flecks, small fragment decorated Mildenhall Ware, animal bone, much burnt flint (Wilkinson and Murphy 1995, 76–80, table 18; Wilkinson *et al*. 2012)	4780±70	−27.5	3700–3370	*3700–3490 (74%), 3470–3370 (21%)*	Contemporary with context because sample short-lived
	OxA-2299	BL 28c. 266	Charred emmer grains	Area C, pit 265, context 266. Contained charcoal flecks, decorated Mildenhall Ware (Wilkinson and Murphy 1995, 76–80, table 18; Wilkinson *et al*. 2012)	4675±70	−24.8	3640–3340	*3640–3340 (93%), 3210–3190 (1%), 3150–3140 (1%)*	As OxA-2298
	OxA-1915	Bl28D.215	Charred hazelnut shell	Area D, context 215. From a spread of loam with charcoal, burnt flint and Grooved Ware sherds (Wilkinson and Murphy 1995, 80–81; Wilkinson *et al.* 2012)	4060±80	−26.0	2890–2410	*2890–2460 (93%), 2420–2400 (1%), 2380–2360 (1%)*	As OxA-2298
	OxA-1914	Bl28A.138	Charred emmer grains	Area A, context 138. From a posthole (Wilkinson and Murphy 1995, 80–81; Wilkinson *et al.* 2012)	4020±70	−26.0	2870–2350	*2870–2800 (8%), 2760–2340 (87%)*	As OxA-2298
	OxA-2297	Bl28.279	Charred twig fragment	Area D, context 279. Fill of shallow hollow 280, containing part of burnt mound 231, partly peat-covered (Wilkinson and Murphy 1995, 80–81; Wilkinson *et al.* 2012)	3885±70	−25.3	2570–2140	*2570–2520 (5%), 2500–2200 (90%)*	As OxA-2298
Yabsley Street, Blackwall, London	KIA-20157		Waterlogged oak plank. 'Tyloses were absent from the spring vessels in the wood examined suggesting an origin in sapwood' (Coles *et al.* 2008, 227)	Context 155. Plank set on edge along one side of grave containing an adult inhumation, possibly female, accompanied by a substantial fragment of a Carinated Bowl, a flint knife and flint flakes (Coles *et al*. 2008)	5252±28	−22.3±0.17	4230–3980	–	Date of burial and associations if plank was indeed of sapwood

Calibrated date ranges are calculated by the maximum intercept method (Stuiver and Reimer 1986) and rounded outwards to the nearest 10 years, following Mook (1986). Posterior density estimates are derived from the model shown in Figures 1 and 2, using OxCal 4.1.7 (https://c14.arch.ox.ac.uk/oxcal/OxCal.html; Bronk Ramsey 2009) and the IntCal09 dataset (Reimer *et al.* 2009).

TABLE 1: Radiocarbon dates cited, directly or obliquely, in the text, ordered by site

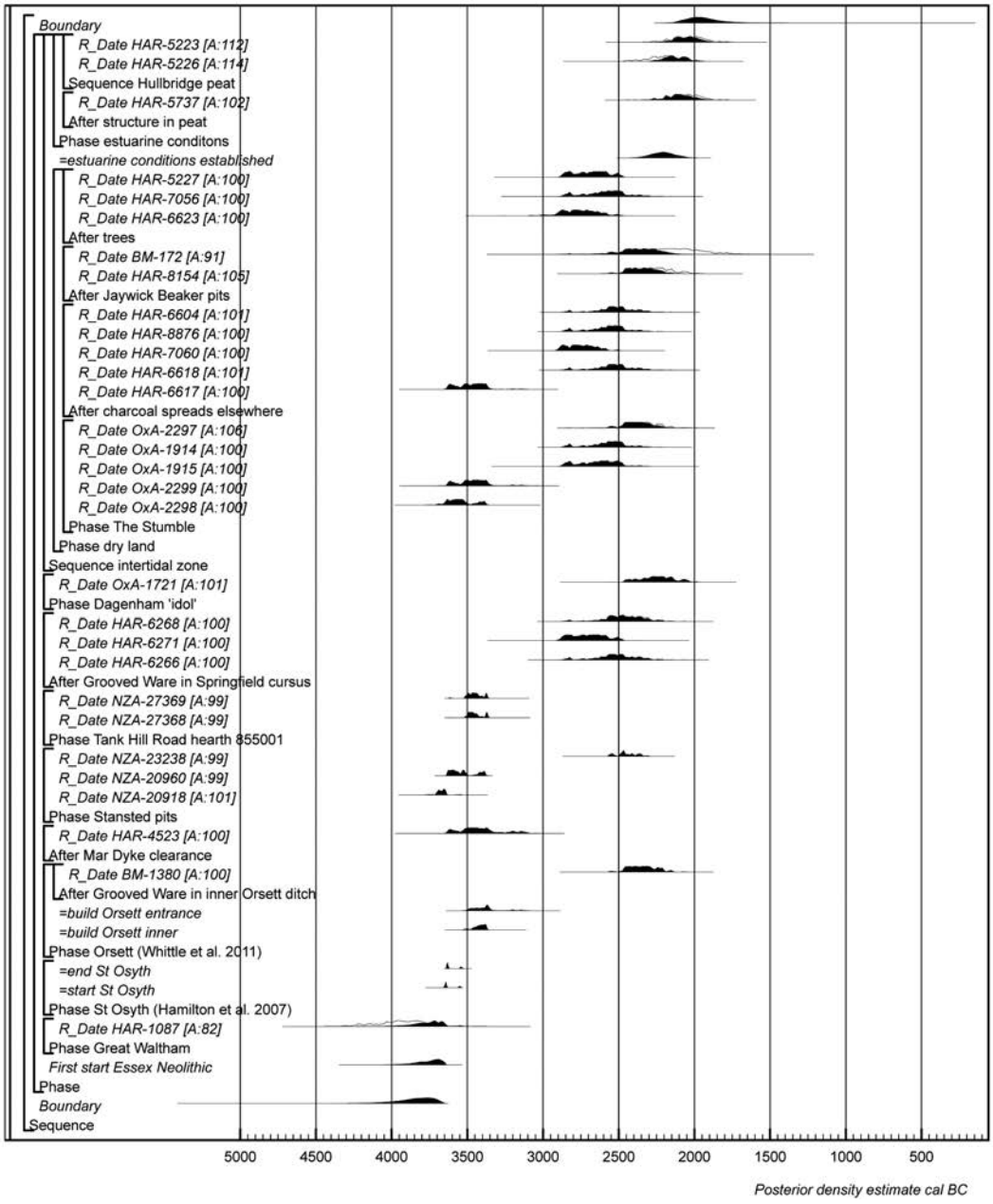

FIGURE 3: A model ($A_{overall}$=116.8) for radiocarbon dates from Neolithic contexts in Essex and for the early stages of the late third/early second millennium cal BC marine transgression. Its structure is defined by the large square brackets down the left-hand side of the diagram and by the OxCal keywords. Each distribution represents the relative probability that an event occurred at a particular time. Where two distributions are shown, that in outline is the result produced by the scientific evidence alone, and that in solid black which is based on the chronological model used. The other distributions correspond to aspects of the model. For example, the distribution '*estuarine conditions established*' is the estimated date for the submergence of areas of previously occupied land in what is now the intertidal zone. Estimated dates for the start and end of the initial use of St Osyth and for two events at Orsett are cross-referenced from the models of Hamilton *et al.* (2007, fig. 61) and Whittle *et al.* (2011, fig. 7.10). 'After' denotes that a date or group of dates has been modelled as a *terminus post quem*. The dates shown here are listed, with others cited in this paper, in Table 1.

remainder has been identified as hazel or alder, which are both relatively short-lived (English Heritage files). There is a particularly fine and extensive assemblage of Carinated Bowl from what seems to have been a land surface exposed in section in a Brickearth quarry at North Shoebury (Wymer and Brown 1995, 20, 70, 74–75). Further finds in addition to those listed by Robin Holgate have been made in an irregular hollow at Slough House Farm (Wallis and Waughman 1998, 9, 132–36, fig. 6, fig. 95:1–5), on a peat-covered palaeosol at Rolls Farm, Tollesbury (Wilkinson and Murphy 1995, 71–76, 131, fig. 77), and in a pit at Great Bentley, where a selection of stones, including white quartz pebbles and a 12 kg lump of conglomerate, seems to have been deliberately placed (Brooks and Holloway 2007; 2008).

The minimal local dating for Carinated Bowl stems partly from the ways in which it was deposited. Such unspectacular contexts as the Little Waltham, Slough House Farm and Great Bentley features and the North Shoebury and Rolls Farm scatters are typical. Occurring in small numbers and often on complex multiperiod sites, they have provided little spur to further investigation. Yet it is these which could yield some of the missing chronological, dietary, and environmental information for the early fourth millennium cal BC. A jadeitite axehead found in Shoebury brickfield, 1 km or less from the Carinated Bowl assemblage (Fig. 4; Pollitt 1953, 52) and two others from Paglesham and Langham (Clough and Cummins 1988, 176–7) may also date from the early fourth millennium cal BC, since one from a similar Alpine source was found beside the Sweet Track in the Somerset Levels, the track itself being dated dendrochronologically to the end of the 39th century BC (Hillam *et al*. 1990). Such artefacts may already have been heirlooms when deposited, since quarrying at the source seems to have ceased by the end of the fifth millennium cal BC (Pétrequin *et al.* 2008, 269).

The Little Waltham and Great Bentley pits, like another at Layer de la Haye (Hedges 1982), exemplify a practice that marks out the behaviour of the fourth and third millennia from what had gone before. Many times more frequent and more widespread than monument building, the digging of pits and their deliberate infilling express new beliefs and practices, perhaps relating to locations thought suitable for recurrent settlement (Garrow 2007, 10–11). Like Tank Hill Road, the Rolls Farm scatter exemplifies the limitations of old land surfaces. It is impossible to tell if a minority decorated element in the Rolls Farm pottery assemblage is contemporary with the rest (Brown 1995a, 131), while a diminution in tree cover reflected in a pollen sequence from some 200 m away (Scaife 1995, 46–49) may well relate to activity shortly before the surface was submerged in the third millennium cal BC (Fig. 3: *HAR-7056, -7060*), rather than to the actions of its early fourth millennium inhabitants.

FIGURE 4: An axehead found in Shoebury Brickfield, analysed in the course of *Projet Jade* and confirmed as made of jadeitite from the Italian Alps. Southend Museum A 1979.5.

Some rectangular timber buildings also date to early in the fourth millennium cal BC, as at White Horse Stone, Kent (Hayden 2008) or Yarnton in Oxfordshire (Hey *et al.* 2003, 81–82), although others may be later, like an example at Gorhambury, Hertfordshire, which would have been built after 3760–3370 cal BC (95% confidence) on the limited evidence of a single date measured on oak charcoal from a bedding trench (Table 1: HAR-3484). There are possibly early Neolithic rectangular structures at Chigborough Farm on a terrace of the Blackwater, dated more by proximity to contemporary features and finds than by the contents of their postholes, and capable of various reconstructions (Wallis and Waughman 1998, 63–5; Adkins and Adkins 1984; 1992). None is likely to have been more than 10 m long.

Robin Holgate's view that earthwork monuments began to be built only after the initial introduction of domesticates and Neolithic artefact types has been confirmed for southern Britain as a whole (Whittle *et al.* 2011, 833–46, fig. 14.179). Long barrows were among the first substantial monuments to be built, some, although not all, of them going back to the 38th century cal. BC (Whittle *et al.* 2007). Sustained aerial reconnaissance and excavation have done nothing to alter the effective absence of classic long barrows from Essex, with the exception of a cropmark at Dedham in the Stour valley, which could be that of a slightly tapering long mound with flanking ditches, a façade and a central feature (Brown *et al.* 2002, fig. 11). Other forms of burial may have been practised. In addition to the simple inhumation grave at Yabsley Street, there are burials in neighbouring areas which have some of the features of a long barrow but lack mounds. At Old Parkbury Farm, Colney Street, Hertfordshire, a hollowed oak trunk, apparently charred *in situ* in a trench-like pit, contained the cremated remains of an adult. A radiocarbon date on the trunk provides a *terminus post quem* for the burial in the first quarter of the fourth millennium cal BC (Table 1: OxA-3301). Although published as a logboat (Niblett 2001), this echoes the often timbered linear zones encountered in long barrows, as do other unmounded features elsewhere (Bradley 2007, 54–59). What *has* increased is the number of more-or-less continuous elongated enclosures which are sometimes seen as a regional variant of long barrows (Fig. 5; Buckley *et al.* 1988, 86; Ingle and Saunders 2011, 22–26). Their roles, original forms, and precise dates remain unclear. Indeed there is no evidence that they were funerary — the name 'long mortuary enclosure' is a confusing inheritance, and it is argued below that many of them were not mounded and were of later rather than earlier fourth millennium cal BC date.

CAUSEWAYED ENCLOSURES AND OTHER MONUMENTS

Orsett (Fig. 2) and Springfield Lyons, the only two Essex causewayed enclosures known in the 1990s (Holgate 1996, 16), are now augmented by an extensively excavated monument at Lodge Farm, St Osyth, on the Tendring peninsula (Germany 2007). There may be a further example at Southminster on the Dengie peninsula (Ingle and Saunders 2011, fig. 3.5). The three excavated monuments differ substantially in size, layout and construction, as if the communities that built them had distinct needs and priorities. If causewayed enclosures from

FIGURE 5: Aerial photograph of an elongated enclosure and ring ditches at Feering on the upper Backwater (Ingle and Saunders 2011 fig. 2.9). © Essex County Council

immediately adjacent areas are taken into consideration, the variation becomes even more marked (Table 2). St Osyth stands out in three respects. Firstly, at over 5 ha, it is large, since enclosure circuits in southern England cluster between 0.5 and 2 ha (Oswald *et al.* 2001, fig. 3.23). Secondly, it differs from all other excavated causewayed enclosures in that artefacts, food remains and hearth debris were concentrated in numerous pits in the interior rather than in the ditch segments, which are normally the focus for such material. Thirdly, Bayesian modelling of radiocarbon measurements on rigorously selected samples indicates a very short initial use, of *1–40 years (95% probability)*, between *3670–3630 cal BC* (*61% probability*) or *3570–3540 cal BC* (*34% probability*) and *3640–3610 cal BC* (*61% probability*) or *3560–3530 cal BC* (*34% probability;* Fig. 3: *start St Osyth, end St Osyth*; Hamilton *et al.* 2007, fig. 61). Springfield Lyons remains undated and only one new sample has been dated from Orsett. Here, the five original dates from fourth millennium cal BC contexts were all measured on bulk charcoal samples and have therefore been modelled as *termini post quos* for their contexts. The admittedly imprecise estimates for Orsett indicate that the enclosure was built in the mid 36th century cal BC at the earliest, possibly later, and almost certainly after St Osyth had already gone out of use (Fig. 3: *build Orsett inner, build Orsett entrance*; Whittle *et al.* 2011, 359–61). By the time St Osyth was built, the custom of creating such monuments was already well established in southern and eastern England, where causewayed enclosures were constructed from the late 38th or the early 37th century cal BC onwards. A spread northwards and westwards to the limits of their known British distribution in the course of the 37th century may well reflect introduction in the course of cross-channel contact followed by uptake over a wider area (Whittle *et al.* 2011, figs 14.15, 14.16).

There may have been a fifth enclosure on the Chalk of the north-west of the county at Saffron Walden, where over 200 m of discontinuous ditch with decayed antlers at the base and, at one point, containing two human skeletons, were observed at the turn of the nineteenth and twentieth centuries (Basset 1982, 5). The antlers on the base of the ditch recall practice in enclosures elsewhere on the Chalk., despite Oswald *et al*.'s dismissal of the site as an unlikely causewayed enclosure (2001, 151). Some of the antlers survive in Saffron Walden museum (Nigel Brown pers. comm.), so that it would be possible to date them. The locations of the more certainly identified Essex enclosures not only preclude the preservation of the bone and antler, they also limit information about the settings in which they were built. This is a pertinent question because there is a difference between the locations of causewayed enclosures in eastern England and the on chalklands of Sussex and Wessex. On the Chalk, enclosures seem consistently to have been built in clearings in woodland (Thomas 1982; Bell *et al*. 2008, 449–52). To the east, things look different. Rob Scaife's analysis of pollen from the Kingsborough 2 ditch sequence on Sheppey (2008) indicates that the two adjacent enclosures there were built and used in an environment dominated by open grassland, with some cereals and weeds of cultivation. This more open location is echoed in Cambridgeshire, at Haddenham in the Great Ouse valley (Peglar and Waller 1994; Peglar 2006), and Etton and Northborough in the

Site	Category	NGR	Topography	Approx. area (ha)	Summary description	Selected references
Orsett	Certain	TQ/6515 8055	End of a spur of a gravel terrace, overlooking a small tributary of the Thames	2.7	Slightly ovoid plan. Three circuits, outer two very close together, probably flanking a single almost continuous, bank. between 2 outer circuits Palisade with entrance structure immediately inside middle circuit	Hedges and Buckley 1978
Springfield Lyons	Certain	TL/7357 8180	Promontory between two small streams, overlooking Springfield cursus	<1	Single arc of causewayed ditch, cutting off promontory. Mildenhall Ware and other cultural material in segments and in exterior pits	Brown 1997; Brown and Medlycott 2013
Lodge Farm, St Osyth	Certain	TM/1355 1545	Low gravel spur above St Osyth Creek	>5	Irregular plan, defined only in E, where there were 3 circuits, and in SW, where there was 1, and not readily distinguishable in air photographs. Numerous internal pits.	Germany 2007
West Road, Saffron Walden	Possible	TL/540 379	Chalk of upper slopes of Slade valley	–	>200 m of discontinuous ditch 2 m or more deep with decayed antlers at the base, 2–3 skeletons at one location. Noted during development of area in late nineteenth and early twentieth centuries	Bassett 1982, 5
Southminster	Possible	TL/9686 0045		0.5	Single sub-triangular circuit of discontinuous ditch, within diverse cropmark complex, including two clusters of ring ditches. Unexcavated	Ingle and Saunders 2011, fig 3.5
Sawbridgeworth, Hertfordshire	Probable	TL/4830 1396	S-facing slope between the river Stort and a tributary	3.5	Three incompletely visible parallel circuits, running straight for most of their length, turning at either end before disappearing under alluvium and into a wood. Unexcavated	Oswald *et al.* 2001, figs 2.24, 5.18
Freston, Suffolk	Probable	TM/1680 3795	Surrounding head of shallow dry valley, with spring at centre of enclosure	8.55	Slightly irregular subtrapezoid plan, with some lengths of ditch concave rather than convex. Two parallel circuits with intervening palisade. Unexcavated	Oswald *et al.* 2001, fig. 3.14
Kedington, Suffolk	Probable	TL/7010 4725	In meander of river Stour, on SW-facing spur tip	<1	Single arc of causewayed ditch cutting off spur. Unexcavated	Oswald *et al.* 2001, fig. 5.21

TABLE 2: Certain, probable and possible causewayed and related enclosures in Essex and immediately adjoining areas

Welland valley (Pryor 1998, 351; M. J. Allen pers. comm.). The chalkland populations seem to have chosen to build communal monuments away from areas where they and their animals normally lived, while the eastern English populations chose to build theirs in inhabited landscapes.

There are two imperfect indications that the Essex enclosures may have conformed to the eastern English pattern. At St Osyth, the charcoal and charred plant remains from enclosure period contexts were compatible with a predominantly grassland setting (Fryer 2007; Gale 2007),

although the composition of both could have been filtered by human selection. In the Orsett area, a pollen core from the channel of the Mar Dyke, about 7 km west of the enclosure, shows an episode of clearance and cultivation, probably in the mid to late fourth millennium cal BC (Fig. 3: *HAR-4523*; Wilkinson 1988, 103–109, 123–125; Scaife 1988). This might overlap with the construction and initial use of the Orsett enclosure, although both are so imprecisely dated that this is far from certain. Lack of relation between the two is made more probable by Scaife's opinion that the cultivation occurred close to the sampling point because pollen input into a small catchment dominated by dense alder carr would be local (1988, 113).

The Orsett, Springfield Lyons and St Osyth enclosures all share a style of round-based Bowl characterised by relatively heavy rims, a wider range of profiles (often neutral or closed) than Carinated Bowl and, on a minority of vessels, decoration which can sometimes be elaborate (e.g. Hedges 1980, fig. 12:4). This Mildenhall style is the East Anglian aspect of a decorated Bowl tradition extending across southern England and broadly contemporary with the emergence of causewayed enclosures. Its use links the Essex enclosures to two small ring ditches. One excavated in 1963 in Great Arnold's Field, Launders Lane, Rainham, 11 km from Orsett, and described briefly by Jean MacDonald (1976, 21) and John Hedges (1980, 28), has finally come to publication (Cotton *et al.* 2011, 24–36). Here, silting patterns indicated a former internal bank or mound. An artefact-rich black sand had been dumped at the interface of the primary and secondary silts in the south-west quadrant, where finds were concentrated. The localised deposit and the large size and high quality of the Mildenhall Ware sherds in it point to an extra-domestic use. A central pit was of later date, since it contained Beaker as well as Neolithic sherds. This was cut into the underlying gravel, suggesting that the centre of the area within the ring ditch was probably not covered by any substantial earthwork. At Brightlingsea, 5 km from St Osyth, a complex history of multiple recuts, re-location of the single causeway, the partial segregation of flint and pottery in the ditch, the deposition of two parts of the same decorated pot in ditch butts flanking the first entrance, and a fragmentary cremation burial under another, inverted, pot (Clarke and Lavender 2008, 5–10, 55–7; Brown 2008), all point to ceremonial functions. The cremation is an example of non-long barrow burial in this period — there may be another in a preliminary report of an 'early Neolithic cremation vessel containing human bone' from Chignall St James (Schofield and Peachey 2008), although the identification of the pottery needs to be confirmed.

Brightlingsea and Rainham are two among a small number of eastern English ring ditches, apparently unmounded and of modest dimensions and diverse histories, which date to the mid fourth millennium cal BC. They include examples at Eynesbury, Cambridgeshire (Ellis 2004, 7–13); Elton, Cambridgeshire (French 1994, 20–23, 37–38, 47–48, 170–71) and the first phases of monuments at Horton, Berkshire (Ford and Pine 2003), and Staines Road Farm, Shepperton, Surrey (Jones 2008). They share certain characteristics, including one or more causeways and irregular plans and profiles, suggesting that they were dug in conjoined segments. They merge into the loose agglomeration of 'hengiforms', most of which date from the late fourth or the third millennium cal BC. They may be at the root of this tradition, especially as the second phases of both Horton and Staines Road Farm were the work of users of Peterborough Ware which occurs more frequently in such monuments.

THE BUSINESS OF LIVING

Living sites continue to survive as pits and artefact scatters, like the earliest Neolithic ones, but more frequent. Pits on open sites continue to occur alone or in small numbers, like a pit containing Mildenhall Ware at Asheldham (Bedwin 1985), in sharp contrast to the total of over 100 excavated inside the St Osyth enclosure. The frequent incompleteness of both the pots and the knapping sequences has led Duncan Garrow to conclude that their contents were selected from 'pre-pit' contexts, perhaps middens (2006, 52–53). There are hints of variation in kinds and intensities of activity across the landscape. An exiguous tally of pits and stray finds on the upper valley slopes and Boulder Clay plateau edges at Stansted airport (Cooke *et al.* 2008, 20–28), confirmed on the line of the A120 east of Stansted (Timby *et al.* 2007), contrasts with the more abundant record of the gravel terraces of the river Blackwater (Brown 1997, 92–93). Here, a succession of investigations over the decades, has documented an approximately 3 km length of terrace in the Heybridge area, made up of a block formed by Lofts Farm, Slough House Farm, Chigborough Farm and Rook Hall (Wallis and Waughman 1998, fig. 1) and augmented by the detached but nearby excavated areas of Howells Farm, Elms Farm (Atkinson and Preston 2001), Heybridge Basin Marina (Brown and Adkins 1988), Langford Hall Reservoir (Heppell and Roy forthcoming) and locations in Heybridge itself. The upshot of this accumulation of evidence is an uneven density of Neolithic activity, even on comparable terrain. Against a generally thin spread of pits and stray artefacts, the relatively small area of Chigborough Farm, excavated in 1981–82 (Adkins and Adkins 1984; 1992), amounting to only approximately 0.02 ha (Wallis and Waughman 1998, fig. 48), produced more early Neolithic pottery than the many times more extensive excavations of 1988–90 (Brown 1998, 139 — NB figures 98 and 100 in this publication are transposed: figure 98 shows pottery from the 1981–82 excavation, figure 100 pottery from the 1988–90 excavation).

Even the highest artefact densities on the ploughed and eroded terrace are eclipsed by those on sites preserved under the sediments of the Blackwater estuary. At The Stumble, a couple of kilometres downstream, pits and traces of post-built structures were comparable with those on the terrace, but many times more artefacts were recovered from the old land surface than from subsoil features (Wilkinson *et al.* 2012). This could be a snapshot of what has vanished from the terrace sites. On the terrace, the equivalent of the thousands of sherds in the old land surface at the Stumble would simply not have survived, while the equivalent of the thousands of lithics would have survived in successive soils but would almost all have been removed by the machining-off of topsoil prior to excavation. Alternatively, the dryland valley bottom in which the mid fourth millennium cal BC occupation of The Stumble took place would have been a different terrain from the terrace and may have been used differently. Extrapolation from one to the other may not be justified.

Charred plant remains at The Stumble make it clear that cereals, mainly emmer wheat, were being cultivated by the

mid fourth millennium cal BC, and that hazelnuts continued to be collected, some of both being directly dated (Fig. 3: *OxA-2298, -2299*). Charred plant remains were many times better preserved and more abundant there than on the higher, exposed sites. This may be an aspect of the different use of two terrains suggested above. Alternatively, and more probably, charred cereals may have survived well in the consistently wet conditions that followed submergence in the estuary, while those on the terrace were degraded by continued cycles of wetting and drying over a further four thousand years (Peter Murphy pers. comm.). The immediate setting of all this remains unclear. The lime-dominated woodland reflected by the pollen from the old land surface at The Stumble (Scaife forthcoming) may have flourished at a later date, since, reverting to the problems of old land surfaces, the site remained exposed and intermittently occupied for over a thousand years after this episode, up to the late third millennium cal BC. The record of the Mar Dyke (Scaife 1988) is a reminder that woodland clearance can be followed by regeneration.

Among the causewayed enclosures, the two most obviously sited in settled areas are St Osyth and Orsett. St Osyth, like the Brightlingsea ring ditch, lay close not only to occupied land on what became the Jaywick-Dovercourt foreshore, but also to commoner indicators of early Neolithic settlement, like small concentrations of early Neolithic lithics among the predominantly later material collected during fieldwalking survey at Brightlingsea (Clarke and Lavender 2008, 22, fig. 15). Orsett, like the Rainham ring ditch, lay within a 13 km stretch of terrace which includes a single pit at Chadwell St Mary (Ennis and Brown 1999), pits and treethrows at Mucking, and pits and postholes containing a Mildenhall Ware assemblage and an associated flint industry on the edge of the Thames floodplain at Brookway, Rainham (Greenwood 1993; Lewis 2000, 68). The Brookway pits and postholes contrast with more transient early Neolithic activity in the Tank Hill Road area, some 4 km away, where sherds of plain Bowl pottery and scant early Neolithic lithics were clustered in an artefact scatter without subsoil features in a cutting 40 m away from the main focus of late Mesolithic activity (Leivers *et al.* 2007, 19, 27). A further, so far unpublished, scatter recovered during a watching brief roughly 1.5 km south-east of the excavated area seems to have resulted from early Neolithic exploitation of chalk flint from an adjacent Pleistocene river cliff (Phil Harding pers. comm.).

DISJUNCTURE

Causewayed enclosures ceased to be built around the middle of the fourth millennium cal BC, although many continued to be used. Large-scale communal effort began to be invested in a very different kind of earthwork: elongated ditched enclosures known as cursus monuments, most with internal flanking banks, some with central mounds. The largest Essex example, at Springfield (Fig. 6), measures 690 m by 50 m. The succession of monument types is unambiguous where cursus monuments were built across causewayed enclosures, superseding them physically and visually, as at Fornham all Saints, in Suffolk, or Etton, in Cambridgeshire (Oswald *et al.* 2001, fig. 8.2). It was more usual, however, for cursus monuments to be built on new sites and at lower elevations, laid out in relation to watercourses. This is summed up in the location of the Springfield cursus, just over a kilometre from

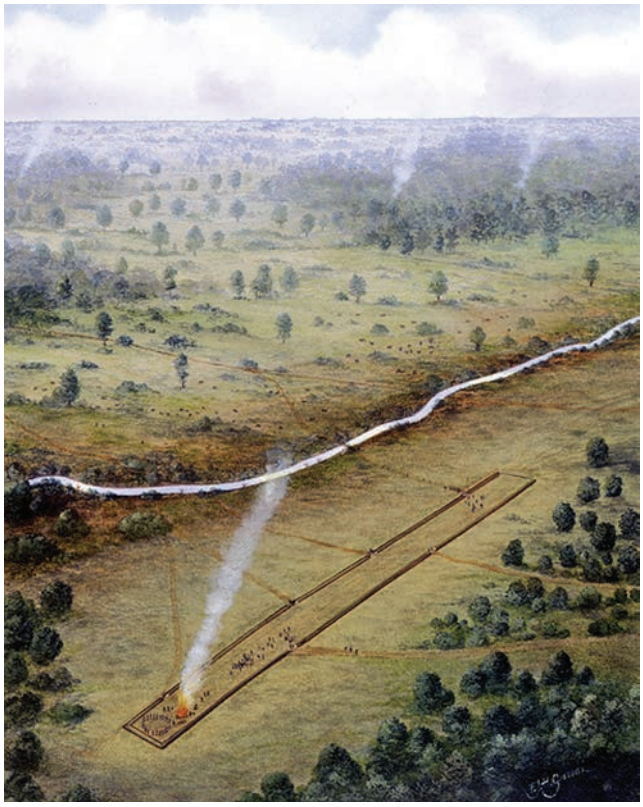

FIGURE 6: A reconstruction of the Springfield cursus (Buckley *et al.* 2001, fig. 34). The reconstruction was prepared at an early stage in the project and shows a number of gaps where excavation subsequently showed the ditch to have been continuous. Gaps towards the west end (right of the picture) were not investigated during the excavations. By Frank Gardiner.

the Springfield Lyons enclosure and lying below it on a gravel terrace where it partly cuts off a meander of the Chelmer (Brown 1997, 91; Buckley *et al.* 2001, 150–52), a location echoed by two smaller cursus monuments on the Suffolk side of the Stour at Bures St Mary and Stratford St Mary (Brown *et al.* 2002). The St Osyth causewayed enclosure may also have been succeeded by a cursus, represented by a subrectangular cropmark measuring approximately 285 m by 85 m some 250 m to the south-east (Saunders 2007). This has been recognised since Robin Holgate wrote, as have two further possible cursus monuments of similar size 1.5 km apart in Chrishall on the Chalk dipslope in the north-west of the county, with a third just over the Cambridgeshire border (Ingle and Saunders 2011, 44, figs 2.11, 2.24). Cursus monuments differed from causewayed enclosures in use as well as in form: they saw very little deposition in contrast to the wealth of artefacts and food remains placed in causewayed enclosures. This must reflect new beliefs as to what should take place in a communal monument. The relative cleanliness means that there has been a dearth of suitable samples for radiocarbon dating, so that the estimate for the national currency of cursus monuments is imprecise, modelled at *3640–3380* to *3260–2920 cal BC* (*95%* probability; Barclay and Bayliss 1999, 25).

Springfield exemplifies the connection between cursus monuments and smaller elongated enclosures, which may be seen as the extremes of a continuum, linked by common plan, cleanliness and location. The line of the Springfield

Site	Dimensions	Summary description	Dating	Comment	References
Rivenhall	49 m × 16 m, ditch surviving to 1.70 m deep	Subrrectangular plan, continuous. Probable mound or bank material in the upper ditch fills, derived from interior. Recuts make it difficult to tell if more entered earlier in fill history	Single plain Bowl rim sherd from high in the ditch fills, possibly redeposited from interior (Buckley *et al.* 1988, 86)	Internal earthwork could have been bank or mound	Buckley *et al.* 1988, 80–82
Slough House Farm	27 m × 12 m, ditch surviving to between 0.12 and (rarely) 0.70 m deep	Irregular rectangular plan, sometimes broken perimeter due to either original entrances or later damage	*Terminus ante quem* provided by Beaker set into topmost ditch fill (Wallis and Waughman 1998, 9)	Ditch could have provided material for no more than a bank	Wallis and Waughman 1998, 9–12
Yarmouth Road, Broome, Norfolk	48 m × 18 m, ditch surviving to up to 0.50 m deep	Oval plan, 1 lateral and 1 terminal entrance. No indication of internal earthwork in sections	4 four body sherds were comparable with more diagnostic plain Bowl sherds from nearby pits (Robertson 2003, 236)		Robertson 2003
Weasenham Lyngs, Norfolk	50 m × 20 m, ditch surviving to up to 0.50 m deep	Survived as earthwork into earlier twentieth century. Sketch (Petersen and Healy 1986, 72, pl. XVIII) shows oval earthwork with slight external bank and higher internal bank surrounding a raised, flat, platform-like interior	2 sherds from a Mildenhall Bowl from above ditch fill, possibly redeposited from interior (Petersen and Healy 1986, 80)	Embanked rather than mounded. Original form may have been as sketched, alternatively, sketch may reflect survival of interior to something like original height while light, sandy soil of surrounding area ploughed down	Petersen and Healy 1986
Brampton, Cambridgeshire	90 m × 20 m, ditch surviving to 0.30 m deep	Oval plan, 2 terminal entrances.	*Termini ante quos* provided by third millennium cal BC radiocarbon dates for charcoal from pits cutting silted enclosure ditch (Table 1: GU-5264, -5265; Malim 2000, 70).	Ditch could have provided material for no more than a bank. Internal features, including small penannular ditch inside 1 entrance, suggest interior was open.	Malim 1999, 80–83; 2000, 66–70
L222, Biddenham Loop, Bedfordshire	28 m × 20 m, ditch surviving to up to 0.50 m deep	Oval plan, 1entrance in SW. Narrow, slot-like recut in ditch for part of circuit. No indication of internal earthwork in sections		If there had been an internal mound one would expect some trace of it in the ditch sections	Luke 2008, 81–88
Willington VI, Bedfordshire	28 m × 16 m, ditch surviving to up to 0.60 m deep	Oval plan, continuous, no sign of recutting or of internal earthwork in ditch fills			Pinder 1986, 18–21
Raunds, Northamptonshire	117 m (possibly less) × 20 m, ditch surviving to up to 1 m deep	Subrectangular plan. Ditch fills suggest lateral internal earthworks, but no terminal ones	Construction date modelled as *3350–2890 cal BC* (*95% probability*) on basis of 2 samples from primary fill	Ditch fills suggest internal lateral banks rather than mound	Harding and Healy 2007, 94–102

TABLE 3: Excavated elongated enclosures in eastern England

cursus was continued by that of an elongated enclosure sited 300 m from its north-east end and measuring approximately 37 m x 20 m (Buckley *et al.* 2001, 103, figs 2, 32). Their alignment accentuates the cutting-off of the meander and emphasises a link between them. They could have been built at different times, one aligned on the other; alternatively, they could have been built together. Hints of the original form and date of these smaller elongated enclosures are provided by excavated examples in eastern England (Table 3). Rivenhall, near Witham, is the only one of the eight sites listed where the size of the ditch and its fill patterns would be consistent with the former presence of a mound. One at Weasenham, Norfolk was definitely embanked and others at Brampton, Cambridgeshire, and Raunds, Northamptonshire probably so. The scales and fill patterns of the remaining ditches are all more compatible with flanking banks than with central mounds. The cleanliness of the ditches makes their dating as imprecise as that of cursus monuments. The exiguous evidence, summarised in Table 3, would in most cases be compatible with the later fourth millennium cal BC age which is demonstrated for the Raunds monument, where a construction date of *3350–2890 cal BC* (*95% probability*) was modelled on the basis of two samples from the primary silts (Harding and Healy 2007, 94–102).

In addition to cleanliness and morphology, strong arguments for a link to cursus monuments rather than to long barrows lie in the frequent association of elongated enclosures and cursus monuments and in their occurrence in similar locations, even when they are not associated. The river valleys of eastern England and the Midlands are characterised by groupings of cursus monuments, elongated enclosures and ring-ditches, termed Barford-like complexes by Roy Loveday who includes Springfield among his examples (2007, 65–7, fig. 33). Small elongated enclosures line the Stour and Blackwater valleys (Buckley *et al.* 1988, fig. 10; Ingle and Saunders 2011, 24–25), sometimes in 'Barford' groupings, sometimes alone. These locations reinforce the notion of a common tradition for elongated enclosures and cursus monuments. The 'Barford' elements also occur loosely scattered in the St Osyth-Brightlingsea area, where, in addition to the possible cursus and numerous ring ditches, there is an elongated crop mark enclosure *c.* 1.5 km north-east of the fourth millennium Brightlingsea ring ditch (Clarke and Lavender 2008, fig. 2). Another has been identified *c.* 1 km east of Orsett (Strachan 1996; Ingle and Saunders 2011, fig. 2.5), where there is also a cluster of ring ditches (Holgate 1996, fig. 3). All three causewayed enclosures could have been 'founder monuments' in their areas.

Ring ditches, the third component of Loveday's Barford-type complexes, are problematic. While the vast majority prove on excavation to have been early or middle Bronze Age round barrows, a significant number are not, whether they are of Neolithic date or much later. Those with single or opposed causeways sometimes prove to have been fourth or third millennium cal BC 'hengiforms' or, as embarrassed experience has demonstrated, medieval mill mounds (Martin 1982), possible hengiforms at Great and Little Bentley (Holgate 1996, 19) being two of the casualties (Brown and Germany 2002). There is, however, enough excavated evidence to indicate that the mid fourth millennium practice of building small, more-or-less circular monuments, in which burials were sometimes inserted, persisted, perhaps suggesting less disjuncture at this small-scale (kin group?) level than in communal-scale monument-building. At Langford Hall Reservoir, on the Blackwater near Heybridge, a 6 m diameter ring ditch with a single causeway surrounded a post circle within which were two pits, the larger recut several times, and stakeholes. The ditch and pits contained cremated human bone and pyre debris; and a second ring ditch nearby may also originally have been of fourth or third millennium cal BC date (Heppell and Roy forthcoming). The same holds for the very clean first phase of an elliptical 6 m ring ditch at Great Holts Farm, Boreham, where a slot-like lower profile suggests that it might originally have held timbers, and where two Grooved Ware sherds were the only datable finds from a recut (Germany 2003, 9–13). The post circles of these two monuments are features which became more frequent at this time nationally (Gibson 1998, 59) and echo the 26 m post circle set symmetrically in the north-east terminal of the Springfield cursus (Buckley *et al.* 2001, 113, fig. 4). A two-entranced 14 m ring ditch cut into the south-east ditch of the cursus may have surrounded an inhumation burial, the only surviving component of which was a group of three flint blades, large and of high quality by local standards, one of them edge-ground and formerly hafted, the other two both utilised (Buckley *et al.* 2001, 114–117, 142–46, 155, figs 9, 28). Inhumations with personal grave goods became more frequent in the later fourth millennium cal BC (Loveday *et al.* 2007, 389–90), concurrently with an increase in the range of fine and elaborate flint implements. In this context it is worth remembering an old record from the Chalk of north-west Essex, where a burial with a flint axe and knife found near the Bartlow Hills is noted by RCHME (1916, 5), although no source is cited.

Peterborough Ware, overlapping in currency with the various styles of early Neolithic Bowl and probably developed from them, is the pottery of the initial fills of the Langford Hall Reservoir monument and of the early, although not the primary, fills of the Springfield cursus, where unabraded sherds, many from one pot, were placed in the ditch near the north-east terminal (Buckley *et al.* 2001, figs 11, 19, 23) and further sherds occurred in the sockets of the post circle. A provisional currency for this pottery tradition from the mid-fourth to the early third millennium cal BC (Marshall *et al.* 2009, 68–81) will be further refined (Marshall *et al.* in prep.). Its use overlapped with that of Grooved Ware, the currency of which has been estimated as occupying most of the third millennium cal BC (Garwood 1999, 152), a span that can and will be narrowed. Grooved Ware was stratified above Peterborough Ware in the ditches of both the Springfield cursus and the Langford Hall Reservoir ring ditch. From the third quarter of the third millennium cal BC, the later part of the currency of Grooved Ware overlapped with the earlier part of the currency of Beaker (Bayliss *et al.* 2007b, 50). Rosamund Cleal's conclusion that, in East Anglia, Peterborough Ware, Grooved Ware and Beaker occur more often in separate contexts than in association (1984, 138) remains valid. The reported occurrence of Grooved Ware and Beaker in the same pits at St Osyth is questionable, since the 'Grooved Ware' in question (Lavender 2007, fig. 49: 55–57) is atypical in form and fabric and might be rusticated Beaker.

Peterborough Ware is locally scarce. Figure 7 summarises numbers of findspots of the principal pottery styles, up to and

including Beaker, as they were presented in the 1980 volume and as they were in 2010. Numbers have increased all round, but Peterborough Ware remains the least frequent tradition. The diagram in fact understates its rarity because many of the Peterborough Ware finds consist of scant, stray sherds while those of other styles are more substantial. This contrasts with the situation in Greater London, where Peterborough Ware abounds, outnumbering Grooved Ware, and Beaker is relatively scarce (Cotton 2004, 134–46; Lewis 2000, 73). The uptake of Grooved Ware and all that went with it may have been more complete and/or earlier to the east.

MORE PITS, FEWER MONUMENTS

Monuments became scarcer and smaller-scale towards the start of the third millennium cal BC. Existing structures were visited and used, among them the three causewayed enclosures, the Springfield cursus, and the small Langford Hall Reservoir ring ditch, but new constructions were modest and rare. Some small hengiform monuments continued to be built. An irregular, 30 m two-entranced ring ditch in Tye Field, Lawford (Shennan *et al.* 1985), seemed anomalous among such monuments because of its rich assemblage of cultural material and because it was eventually covered by a mound, but falls into perspective beside Ringlemere in east Kent, where a ring-ditched enclosure with a single causeway was the first, open, phase of a multi-stage monument, the mound of which incorporated large quantities of settlement material (Needham *et al.* 2006, 7–30).

A monument form found in other river valleys in eastern England, characterised by a central ring ditch, possibly surrounding a mound, within a much larger circular enclosure, may be represented by 60 m double ring ditches with entrances at Belchamp St Paul and Langham, both in the Stour valley (Brown and Germany 2002, 47). Both are far larger than local round barrows and may be analogous to sites like the West Cotton 'henge' in the Nene valley in Northamptonshire (Harding and Healy 2007, 117–121), Maxey in the Welland valley in Cambridgeshire (Pryor *et al.* 1985, 59–70), or Harford Farm and Arminghall in the Yare valley in Norfolk (Ashwin and Bates 2000, 82–87; Clark 1936). The dating of all the excavated examples is unclear because, like cursus monuments and elongated enclosures, they were very clean. The clearest indication of a late Neolithic or subsequent date is that the Maxey monument cut a cursus.

The pottery of Lawford (and of the recut at Great Holts, and a stray sherd at Belchamp St Paul) is Grooved Ware. While finds of this ceramic are numerous (Fig. 7), they are often from scattered, often isolated, pits. At least 24 'cooking holes' on the Jaywick foreshore (Longworth *et al.* 1971) and a provisional total of 13 pits at Mucking (Healey 1993, 18) remain exceptional, despite extensive area excavations. Pits are the archetypal Grooved ware context and sometimes show signs of deliberate placement, in ways less often practiced before (cf Brown 1992). Paradoxically, the most spectacular instance of this lacks pottery. Gillian Varndell's publication (2004) of Herbert Haddock's 1949 Great Baddow find, complete with his original sketches, shows how purposefully and regularly five flint axeheads, three of them ground to varying degrees, were set on end in a row, accompanied by an edge-ground flint discoidal knife and a coarse-grained greenstone axehead (Fig. 8). The knife is of a kind made at Grime's Graves in Norfolk in the third millennium cal BC by users of Grooved Ware (Saville 1981; Ambers 1998; Longworth *et al.* 2012). Grime's Graves was not, however, the source of the flint axeheads (Varndell 2004, 120) or, insofar as colour is a guide, of the knife, although a fragment of a discoidal knife roughout from the Stumble may have been made on flint from there (Holgate 2012, 62), unlike a finished example found eroding from the shoreline nearby (Martingell and Larner 2004). An unstratified fragment from Lawford (Shennan *et al.* 1985, fig. 18: F29) probably formed part of the Grooved Ware-associated industry. At Creeting St Mary in Suffolk, a lozenge-shaped form (Ipswich Museum, unpublished) came from 'hole 1', one of a series of pits containing Grooved Ware (Maynard 1951, 209–10). These archaeological (or quasi-archaeological) contexts are exceptional, discoidal knives being one of a range of finely finished flint and stone artefacts which rarely seem to have been purposefully buried.

Special objects aside, the lithic industries of the earlier third millennium continue a gradual trend away from blade production to that of flakes, still regular and controlled, perhaps struck primarily as blanks for retouch rather than for use unmodified. Scatters of this and later dates are sometimes more extensive than earlier ones, as at Brightlingsea (Clarke

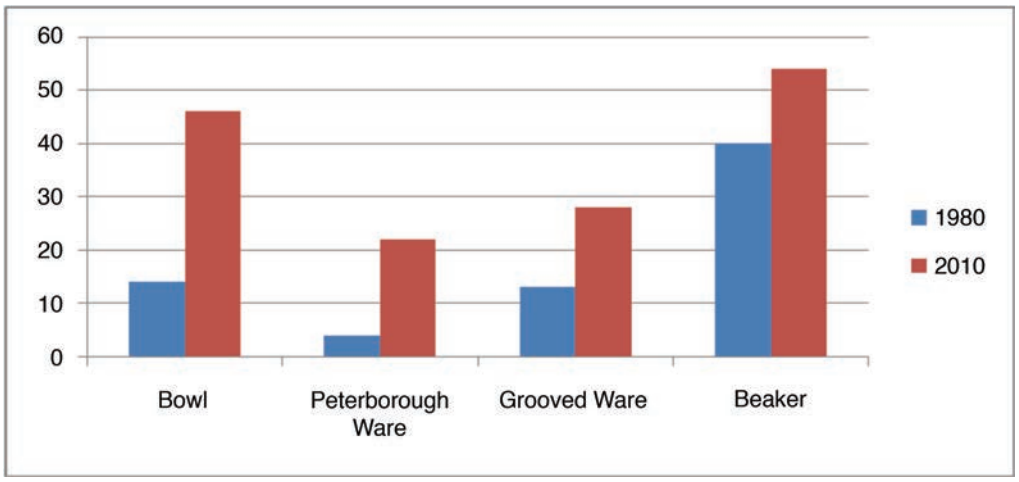

FIGURE 7: Numbers of findspots of the main pottery traditions of the fourth and third millennia cal BC, as published in 1980 and as known in 2010. 'Bowl' is made up of Carinated Bowl, Mildenhall Ware, and indeterminate Bowl.

FIGURE 8: The Great Baddow hoard in an approximate reconstruction of the positions of the objects in the ground.

and Lavender 2008, 22–26, 46–50). Coupled with pits, these are the principal evidence for settlement and are concentrated in previously occupied areas. In the estuaries the intertidal zone is low in artefacts, but less so in activity — a reminder that some land use leaves little trace. Only a small handful of intertidal sites, among them The Stumble, have any artefactual trace of a late fourth or third millennium presence (Wilkinson and Murphy 1995, 104–131), but nine on the Crouch and Blackwater estuaries and on the Jaywick–Dovercourt foreshore had charcoal scatters, often more than one per site (Wilkinson and Murphy 1995, 86–90). Four of the five dated examples fall within the third millennium (Fig. 3: *HAR-6604*, *-6618*, *-7060*, *-8876*). Since the samples consisted primarily or solely of oak, the actual burning episodes may be rather more recent than the dates. The spreads would not have survived unless covered by estuarine deposits and may thus originally have been far more widespread. They included charred wild plant foods but no cultivated cereals; their immediate environment where they did survive was, by the end of the third millennium cal BC, one of deciduous woodland in which oak and lime were prominent (Wilkinson and Murphy 1995, 60; Scaife 2012), although its earlier history remains a matter of guesswork. Wilkinson and Murphy see the charcoal spreads as the remains of specialised woodland activities, in an area by then peripheral to normal settlement (Wilkinson and Murphy 1995, 217; Wilkinson *et al.* 2012). The Stumble at this time would have been close to the shore or to salt marsh. Only on the Jaywick-Dovercourt foreshore did abundant third millennium cal BC settlement evidence accompany the charcoal spreads, corresponding to geomorphological arguments for the area's having been protected by a coastal sand and gravel spit (Wilkinson and Murphy 1995, 217–18).

The Stumble provides evidence for continued cereal cultivation at this time: away from the cereal-free burnt deposits of Area D, emmer wheat (*Triticum dicoccum*) grains from a posthole in area A were dated to the third millennium

(Fig. 3: *OxA-1914*; Wilkinson *et al.* 2012). These contrast with 80-odd charred grains of bread wheat (*Triticum aestivum* agg.) from an isolated pit on a terrace of the Chelmer at Woodham Walter (Boyd 1987). While this may reflect the cultivation of different varieties of wheat on different terrains, it also raises the question of whether the two small, abraded sherds from the Woodham Walter pit (Rodwell 1987, fig. 15: 1, 2) were indeed of Grooved Ware rather than in a later tradition, given the frequency of emmer wheat in later Neolithic contexts (e.g. Robinson 2000). The charred hazelnut shells from the Woodham Walter pit are, however, a recurrent Grooved Ware association.

RECONNECTING WITH THE CONTINENT

The uptake of Beaker pottery, and with it metallurgy, from the third quarter of the third millennium cal BC formed part of a set of major changes of practice and belief, most obviously expressed in a proliferation of inhumation burials, in contrast to the scarcity of recognised burials of any kind the earlier third millennium cal BC (Healy 2012a). In Essex there was no significant change in the main areas of settlement and old monuments continued to be used. Pit digging seems to have become less frequent, however, many living sites simply taking the form of more-or-less degraded spreads of material, and a continued abandonment of blade technology accompanied the adoption of barbed and tanged arrowheads (as pan-European as the Beakers themselves) and of very small, scale-flaked 'thumbnail' scrapers.

One development of this time was the generation of burnt mounds, heaps of calcined flint with charcoal, like four examples at The Stumble, one of them, next to a possible creek, yielding the latest radiocarbon determination from the site (Fig. 3: *OxA-2297*). Late third millennium cal BC examples with Beaker associations are known from the Norfolk fens at Northwold (Crowson 2004) and Feltwell (Bates and Wiltshire 2000). It was now that the present intertidal zone became completely estuarine. The model shown in Figure 3 estimates the date of this event as *2360–2050 cal BC* at (*95% probability*), probably *2300–2130 cal BC* (*68% probability*; Fig. 3: *estuarine conditions established*).

An area at the junction of the Thames estuary and the North Sea is likely to have seen a significant contact, especially from the lower Rhine (Needham 2005, fig. 3). Whether it saw an influx of people is impossible to say, given the rare local preservation of human remains. The pots themselves may be relevant here. Reconsidering the Beaker vessels likely to be closest to continental prototypes, Stuart Needham identifies his 'low-carinated' form as 'the key funerary vessel of the inception phase in Britain' (2005, 178). These vessels, with flaring mouths, generally unemphatic carinations more than halfway down the body, and generally simple decorative schemes, are found in significant numbers between Brittany and the Rhine as well as in sometimes demonstrably early Beaker burials in Britain. There are four among the published Essex Beaker finds, three recovered in the first half of the 20th century, at St Osyth, Alresford and Ardleigh (Clarke 1970, figs 58, 397, 409), and one at Mucking in the second half (Jones and Jones 1975, 137–41). This bias towards old discoveries reflects the numerous finds made during the hand-digging of quarries — the source of all three examples illustrated by Clarke. Rex Hull's photographs (1929; 1946) show how often Beakers from quarries were complete, unlike less frequent finds of Neolithic pottery, and their completeness may have made them more readily recognised by quarry workers. This strongly suggests that most were from burials. While complete Beakers are occasionally found in small pits which could not have been graves, as at St Osyth (Germany 2007, 33, 70–72), they far more frequently accompanied inhumations. One Beaker found upright in a gravel pit at Alresford coincided with the site of a previously observed vestigial barrow (Hull 1946, 67). There were rare survivals of skeletons on favourable geology as at Thorpe Hall (Pollitt 1935, 15) and Berden (Maynard and Benton 1921), although it remained uncertain whether most of the burials had been in flat graves or under long-flattened round barrows.

This has come into clearer focus with the excavation of further graves, in relatively favourable circumstances. At Mucking a body stain showed that a grave-like feature had indeed contained a burial, and the open area excavation made it clear that there was no surrounding ring ditch. Subsequently, there have been more finds of complete Beakers placed in grave-like features without ring ditches, the most convincing being at Elm Park Nursing Home, Ardleigh (Brooks 2001, fig. 4), Elms Farm, Heybridge (Atkinson and Preston 2001, fig. 6) and Orsett Cock (Milton 1985). If these interments had mounds they had no quarry ditches, and it is arguable that there was a local flat grave tradition. In this context, it is worth recalling a crouched burial found by Hazeldine Warren at Walton-on-the-Naze, in a grave underlying the buried land surface (Warren 1912, 120–22), close to an area of Beaker settlement (Warren *et al.* 1936, 182). This cannot long have predated the transgression, because a concentration of waterlogged seeds, mainly of blackberry, was found in the stomach area (Warren 1912, 121). These could have survived only if waterlogging had occurred soon after the individual's death.

Beaker burials in Essex may thus have been far less scarce than they have appeared, obscured by a lack of skeletons and of ring ditches. The five sites mapped by Christine Couchman (1980, fig. 15) could be increased to over 20 by the addition of the majority of the pre-existing finds of complete Beakers and of discoveries made since then. Non-ceramic grave goods remain scarce, confined to 11 barbed and tanged arrowheads (perhaps a quiverful) from Mucking, two barbed and tanged arrowheads accompanying a further, aceramic, burial there (Table 1: HAR-450; Jones and Jones 1975, 140–41), a flint dagger in the Thorpe Park burial (Pollitt 1935, 14–16), and a 'ring of dark metal' on the lower left arm of the skeleton at Berden, which was sold to the local blacksmith immediately after its discovery in 1907 (Maynard and Benton 1921). An alternative, and nationally rare, rite is represented by a report of a cremation burial in a long-necked Beaker in a pit central to a 16 m ring ditch at Hall Farm, Little Bentley (Lavender and Germany 2004).

A previously unsuspected aspect of ritual activity in this period is indicated by a radiocarbon date of *2470–2110 cal BC* at *86% probability* or *2110–2030* at *9% probability* (Fig. 3: *OxA-1721*) for the Dagenham 'idol', a wooden male figure almost half a metre tall found in Dagenham marshes in the 1920s (Drury 1980, 53, pl. 4; Coles 1990, 320, 326, pl. 29a–b). The wood from which it is made has been identified as yew, rather than pine, as previously thought (Barclay and Bradley 2011, 451–54). Since yew trees can live for hundreds

of years, this could raise the possibility that the wood was already centuries old when felled and carved, making the figure more recent than the radiocarbon date. Any age offset is, however, probably quite small, since the figure is made from roundwood (Coles 1990, 320).

ARTERIES, BOUNDARIES AND GOODIES

Nigel Brown's Neolithic 'landscape of two halves' (1997) was the axis of settlement and ceremony formed by the Chelmer-Blackwater corridor. Within it, he highlighted the contrast between the development of large communal monuments around Springfield in the upper valley and the spread of settlement and smaller, scattered monuments along the lower valley and the Blackwater estuary. He related the major monument complex in the Chelmsford area to its location at the transition between the very different topographical zones of the Boulder Clay plateau, immediately to the north-east, and the sands and gravels of mid-Essex on which the monuments lie, on rivers providing communication between the plateau, the sands and gravels, and the coast (1997, 96). The discovery of further Neolithic or probably Neolithic monuments in the St Osyth-Brightlingsea area suggests a landscape of three thirds, in which the well lived-in Blackwater valley linked the inland monuments to a second major monument complex near the coast, where the river Colne provides a further communication route with the interior.

The Stour valley has seen little development and consequently little investigation, but abundant lithic collections attest to settlement, and the cropmark record attests to monument complexes on both banks, spaced along the river, between the Freston and Kedington causewayed enclosures (Brown *et al.* 2002). Like the Chelmer-Blackwater corridor, it seems to have been a focus of settlement and ceremony, anything but a boundary. It is not only monuments and settlements that cluster here. There is a concentration of stone and flint axeheads extending from the Colne to the Deben, with a higher frequency of stone (i.e. non-local) implements than the surrounding areas (Hedges 1980, figs 13–14; Holgate 1996, fig. 5; Martin 1999a, 37). This includes the rich collecting ground of the Jaywick–Dovercourt foreshore, but also extends well beyond it into less favourable collecting conditions. The axeheads float contextually and chronologically, since most were stray finds and flint and stone axeheads were current through the fourth and most of the third millennium cal BC. There is also a long-identified concentration of early Neolithic single-piece flint sickles (Clark 1932, fig. 6), nationally rare and often finely worked (e.g. Warren *et al.* 1936, pl. XLII).

Such a concentration of fine and exotic objects is, however, unmatched in the Chelmer-Blackwater corridor, Great Baddow notwithstanding, and suggests a separate identity and network of contacts for the Colne to Deben area (Brown *et al.* 2002, 1), one later to be expressed in the local development of the distinctive Ardleigh style of middle Bronze Age urns and equally distinctive cemeteries formed of clusters of small ring ditches (Brown 1995b). Any wider territorial division could lie farther north. Causewayed enclosures occur through Essex and south Suffolk, but have proved difficult to identify in north Suffolk and in Norfolk (Oswald *et al.* 2001, fig. 1.1), where extensive early Neolithic pit sites are more frequent than elsewhere (Healy 2012b). Peterborough Ware is scarce in Essex and, if the evidence of pits alone is a reliable guide, it is also scarce in south Suffolk, but more frequent in north Suffolk and in Norfolk (Garrow 2006 fig 3.7). This could suggest deep roots for what was, by the end of the first millennium cal BC, the boundary between the Trinovantes and the Iceni, which, on the evidence of coin distributions, ran roughly from the Lark along the upper Orwell to the Alde (Martin 1999c, 39). Such a long history for a boundary zone is not implausible, and can be compared with that suggested by Francis Pryor for the Welland valley (2002).

The Colne-Deben concentration of flint and stone axeheads also includes battle-axes and axe-hammers which began to be made only in the late third or early second millennium cal BC. In other words, the area continued to attract exotic objects into the early Bronze Age. There is also a slight concentration there of second millennium cal BC metalwork (Couchman 1980, figs 16–17; Martin 1999b, 39). Similar histories can be read, on a smaller scale, for the Tilbury and Southend peninsulas (Hedges 1980, figs 13, 14; Couchman 1980, figs 15–17; Holgate 1996, fig. 5). It is difficult to know what to make of them. These concentrations of fine and exotic objects are overwhelmingly made up of unstratified finds, spanning millennia. The Colne-Deben and Tilbury peninsula concentrations had the St Osyth and Orsett causewayed enclosures as 'founder monuments' and went on to become foci of round barrow construction (Ingle and Saunders 2011, fig. 3.1; Lawson *et al.* 1981, fig. 1); the Southend peninsula seems to have lacked an early Neolithic monument and did not see the building of many round barrows. The Chelmer-Blackwater catchment has the 'founder monument' and the round barrows but was not the same kind of focus for fine and exotic objects. These artefact concentrations are not alone, they can be matched, for example, on the south-eastern fen edge in East Anglia (Healy 1996, 180) or certain reaches of the Thames in Greater London (Barclay 2011), as well as in other regions, in all kinds of relations or the lack of them to monuments

LOOKING FORWARDS

Some of the aims highlighted in the two previous papers have been met impressively. Sustained aerial reconnaissance has culminated in the Essex section of the National Mapping Programme (Ingle and Saunders 2011). Progress has been made on the concomitant need to evaluate cropmark and other undated sites. On the downside, this has emphasised that not all cropmarks are what they seem and that circular ones can be among the most deceptive. On the upside, it has raised the possibility of Neolithic monument complexes among the ring ditches at Belchamp St Paul on the Stour and in the area of the Rivenhall elongated enclosure on the Blackwater (Brown and Germany 2002). It has also shown that the minimally destructive evaluation trenches excavated so far may not succeed in characterising or dating essentially clean monuments. There may be a case for more intensive investigation.

Characterisation becomes fluid in the face of an increasing number of monuments which do not conform to any previously defined type. Diverse 'non-classic' Neolithic monuments have been excavated in the river valleys of eastern England, summarised by Harding and Healy (2007, 276–80), and more are almost certainly present in Essex, most obviously a space measuring approximately 40 m x 20 m at Bures,

FIGURE 9: Cropmark at Mount Bures (Ingle and Saunders 2011 fig. 2.8)

defined by flanking ditches with a full row of widely spaced postholes or pits inside one ditch and a fragmentary row inside the other (Fig. 9; Brown *et al*., 2002, fig. 4, pl. IV). Other 'non-classic' forms may not have crossed the radar of recognition. The unexpected must be expected. Some found fanciful John Hedges' suggestion that occasional standing stones, as well as large blocks of sandstone in and around churchyards, might derive from pagan stone monuments (1980, 30). Yet at Stansted a large sarsen was found in a middle Bronze Age pit within an area of multi-period, but predominantly fourth millennium cal BC Neolithic activity, prompting the speculation that it may have been a re-deployed Neolithic monolith (Cooke *et al.* 2008, 27–28).

When it comes to artefacts, Robin Holgate's call for the analysis and recording of museum collections is yet to be met. This applies across the board. Recently excavated material is sometimes deposited after only minimal published description. Vintage archives remain incompletely tapped — there is still more to be done even with Hazeldine Warren's notes and material, of which only the Grooved Ware has been systematically described and contexted, especially as the Hullbridge Survey has established that the Jaywick-Dovercourt land surface from which he collected is largely destroyed (Wilkinson and Murphy 1995, 102). The mass of both opportunistic and systematic surface collection from elsewhere still awaits analysis.

It should be remembered that flint as well as stone could have been transported, at all stages of working. This is recognised on a site-by-site basis, as in the identification of small amounts of chalk flint at The Stumble (Holgate 2012), Stansted (Cramp 2008) and St Osyth (Martingell 2007). Alongside this is the use of distinctive, high quality flints for axeheads, as at The Stumble, Stansted, Springfield (Healey 2001, 135) or North Shoebury (Wymer and Brown 1995, 70). There has, however, been no attempt to quantify or analyse these occurrences, which, in the case of the axeheads, could reflect anything from careful selection from local sources to import over distances of varying length. Colours alone suggest that secondary sources such as tills as well as primary ones in the chalk were involved. These considerations could contribute to an understanding of mobility, ranges and contacts. It should not be forgotten too that the transportation of Neolithic quern materials is becoming increasingly apparent in other regions (Roe 2009).

There remains a case for making the most of the coast. Work since the Hullbridge survey has shown that the preservation and accessibility of some of the Essex estuarine Neolithic sites result from the fortunate coincidence of a very specific set of variables which are not replicated around most

of the coast of south-east and eastern England. The rarity of such sites is highlighted by the results of English Heritages's Rapid Coastal Zone Assessment Survey, during which only one possibly comparable site has been found outside Essex, on the north Kent coast at Hoo Flats (Murphy and Trow 2005; Wessex Archaeology 2005, 33). In these circumstances, The Stumble and sites like it are a rare resource, the potential of which should be exploited to the full. It has become particularly clear how many times better preserved charred plant remains are on the intertidal sites than on the gravel terraces, where the potential for recovering vegetation and subsistence evidence is possibly lower than it appeared in the 1990s.

For all this, there is a need to build on the progress that has already been made towards joined-up thinking about the *whole* landscape. Different parts of the landscape may have been used, occupied and perhaps perceived differently (Garrow 2007, 10). Projects focussed on a single topography, whether that of the intertidal zone or a particular river valley, elucidate only a part of the picture. The main areas of activity are unlikely to change, but there is enough evidence to show that other areas, including the Boulder Clay plateau, were also used. There is a need to think about *how* they were used.

It is difficult to think of a local pollen sequence which shows major, rather than patchy, forest clearance before the mid second millennium cal BC, the time of the field systems discussed by David Yates (this volume). Even the probably mid to late fourth millennium cal BC clearance in the Mar Dyke catchment (local pollen zone MD2) was seen as local, and was less marked than the second millennium clearance of MD4 (Wilkinson 1988, 103–109, 123–125, fig. 98; Scaife 1988), and human interference with the vegetation at Rolls Farm was slight. It does not help that the fourth and third millennia cal BC are rarely represented in pollen profiles because, in the estuaries and river valleys, it was rising water levels in the late third millennium which led to a proliferation of polleniferous deposits. Perhaps all fourth and third millennium cultivation and pasture occupied fairly small clearings. Yet there is evidence for open conditions around some eastern English enclosures, summarised above. In Essex, the laying out of the 690 m long Springfield cursus and the much smaller elongated enclosure on the same alignment 300 m to the north-east (Buckley *et al.* 2001, 103, figs 2, 32) implies, whether they were contemporary or successive, a clear line of sight of at least 1 km. Either this was created for the monuments, or there were more extensive cleared areas on the gravels than the largely estuarine and riverine pollen profiles reveal. Landscape-wide vegetation reconstruction is a major challenge, given the limitations of the local evidence. It would be a challenge worth meeting.

Robin Holgate's plea for better dating (1996, 24) is as valid as when it was printed. Living sites, post-built houses, pit deposits, various pottery styles and cereals have all been dated in other areas with equally inimical bone and antler preservation, only the cleanest of monuments proving resistant. They could be dated in Essex. His plea for adequate attention for Neolithic finds on predominantly later sites could be translated into a more specific call to investigate, and date, the small and the inconspicuous. It is in the scattered pits and treethrows that a large part of the evidence for the fourth and third millennia cal BC lies. Some of the earliest Neolithic material is particularly likely to occur in such contexts, and potentially early material is insufficiently dated. The model shown in Figure 3 estimates that the Neolithic in Essex started in *3960–3640 cal BC (95% probability)*, probably *3820–3650 cal BC (68% probability*; Fig. 3: *start Essex Neolithic)*. The gross imprecision of this estimate springs from its dependence on a single date with a large standard deviation (Fig. 3: *HAR-1087*) for the earliest stages of the period, all the other dates in the model being considerably later. One radiocarbon date should not have such an influence on the outcome. If there were an even spread of high-quality dates throughout the period this single measurement would cease to have so much weight.

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Connecting and Disconnecting in the Bronze Age

David Yates

INTRODUCTION

Between 1500–700 BC far greater economic expansion and social change occurred compared with anything that had gone on before. Throughout Europe widely spaced parts of the continent were drawn together in an expanding communications network resulting in the movement of people and ideologies. The lower reaches of the Thames became politically and socially dominant during this time with a dramatic expansion in settlement. Wealth was growing through agricultural intensification, and part of the resulting farming surplus was used to compete for status objects, particularly bronze metalwork used for ornaments and weaponry (Yates 2007). Southern English political economies were able to acquire, control and 'consume' status objects obtained through European long-distance alliances (Barrett and Bradley 1980,260. Rowlands 1980). The wealth derived from participation in an increasingly cosmopolitan world is clearly seen in the significant increase in metalwork recorded in Essex and Kent between the Early and the Late Bronze Age (Figure 1). In short, people along the Thames and the South-Eastern corner of Britain became rich and well connected (Bradley pers. comm.).

Essex had clear advantages in this new outward looking world where social standing was defined, in part, in terms of long distance alliances and the ability to compete for prestigious possessions.

Essex, a maritime county, has an abundance of sheltered estuaries along its North Sea coast. From its southern shoreline it is possible to view seafarers negotiating the surging tides of the estuary and the lower reaches of the Thames. Consequently Bronze Age communities in Essex were able to benefit from major changes affecting southern Britain during the late second and early first millennium BC.

Developer-led excavation and the advent of the Portable Antiquities Scheme have contributed to our understanding of the tempo of change apparent in the Middle (1500–1000 BC) and Late Bronze Age (1000–700 BC). Twenty years of commercial work has revealed settlements, field systems, stock enclosures, wells, waterholes and droveways underpinning the new growth-orientated political economies. The evidence suggests an epoch of highly organised mixed farming with considerable emphasis on livestock rearing.

The abundance of Bronze Age material being discovered in fieldwork is in sharp contrast to the levels of material culture, monument building and land exploitation noted before 1500BC. At the end of the Bronze Age there was a substantial decline. The pace of economic and social dynamism faltered, inter-regional alliances appear to fail, and communities once having extended links with others, became disconnected.

Evidence that seaboard communities along the Straits of Dover and the foreshores of the Greater Thames estuary were controlling long distance exchange and alliance formation is reflected in the concentration of Bronze Age settlement. Excavations have recorded the location of many settlements, field systems and other forms of land boundary. The choice of prime sites is apparent, revealing a preference for coasts, major river valleys and estuary foreshores. The Portable Antiquity Scheme has recorded several hundred well-provenanced findspots in Essex and Kent, including more weaponry and ostentatious ornaments – the attendant social câche of elitism.

This paper reflects on new finds in Essex, starting at Southend-on-Sea, moving along the Thames foreshores to the historic western border of the county – the River Lea. The North Sea coast and inland evidence are then considered.

SOUTHEND ON SEA TO THE RIVER INGREBOURNE (Figure 2)

The intensity of settlement and land use on the northern coast of Kent is reflected on the Essex side of the Thames estuary. The Southend-on-Sea peninsula has a high volume of metal deposition, settlement activity and field construction. This cluster of regimented land use forms a definable enclave of activity (Yates 2001. Yates 2007). Stockraising seems to have been a major priority within the mixed farming regimes. Barford and Major draw attention to the increasing number of loomweights here which might suggest textile manufacture and inter-regional exchange of which woven cloths may have formed a part (1992). The recent discovery of integrated stock pens at Prittlewell shows the degree of sophistication of stockrearing (Ken Crowe pers comm.). A strategic enclave at the start of the estuary mouth, it seems to have been affected by the cessation of exchange networks at the end of the Bronze Age (Yates 2001, Yates 2007, 24). There is a marked decline in activity. Wymer and Brown observe that those few Early Iron Age sites appear to reflect a greater degree of self sufficiency (1995, 157).

The great estuary then funnels maritime traffic into the Thames river mouth. At Mucking two circular enclosures or ringworks were placed at the best vantage point for observing traffic entering or leaving the Thames valley. The use of these two circular structures appear to have changed through time – from defended homesteads in the Late Bronze Age (when the ditches were still being maintained) to communal gathering sites during the Late Bronze Age /Earliest Iron Age transition, when the ditches fell into disrepair (Matt Brudnell pers. comm.) Nearby at East Tilbury a large Late Bronze Age ditched enclosure was recently discovered near to the Thames river mouth. Further west at South Hornchurch a ringwork was found close to the River Ingrebourne; it had contemporary field systems aligned on a droveway leading down towards the Thames (Figure 3). Elements of rectilinear field systems have been discovered at Mucking, Gravesend, Tilbury, Orsett and Upminster (Yates 2001).

There are a series of sites on the alluvial margins on the northern bank of the Thames between the Rivers Ingrebourne and Lea. They suggest intensive and extensive exploitation throughout the Bronze Age. The construction of trackways and jetties at Dagenham, Barking and West Ham gave easy river access. Work on the A13 road confirms an Early Bronze Age construction phase of brushwood trackways along these river

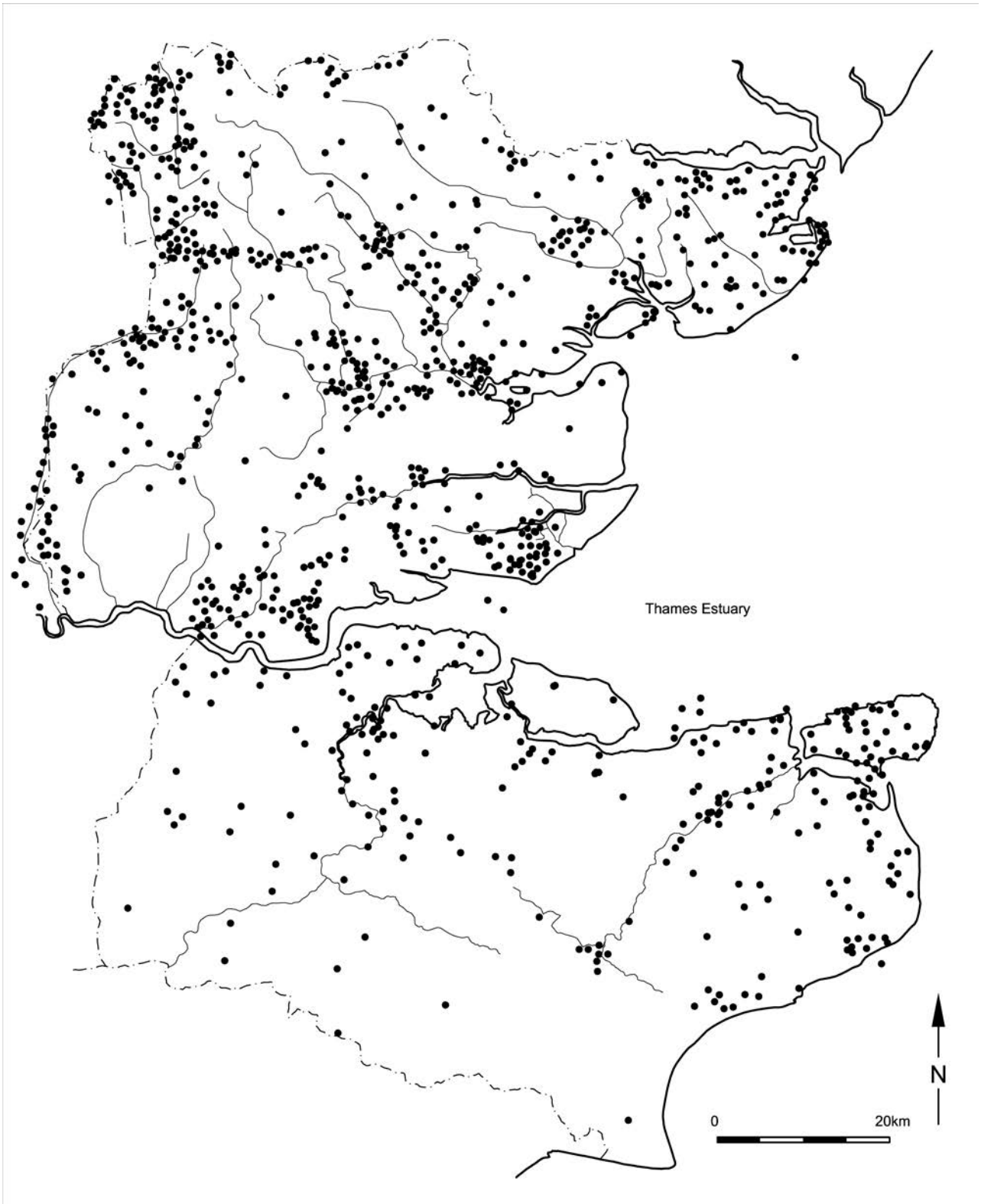

FIGURE 1: Bronze Age metalwork in Essex and Kent. Compiled from data supplied by Martyn Barber, HER and Portable Antiquity Scheme records. © Crown copyright. All rights reserved. Essex County Council 100019602, 2013

terraces (Foreman 2005); they were first identified by Frank Meddens (1996). A construction phase of raised trackways on the south bank of the Thames around Southwark and Bermondsey are of a similar date.

A substantial causeway was recorded at Dagenham. The drovers' way had a metalled surface constructed of pebbles, sandy silts and burnt flint and was capable of withstanding the movement of large animals (Meddens 1996, 326). Immediately due north of this, at Dagenham Heathway, a defended Late Bronze Age sub-rectangular enclosure and settlement was sited on the gravel terraces (Keith-Lucas 2005). A defensive ditch had been added to an existing settlement suggesting increasing concern for security. Some of the pottery associated with the Late Bronze Age settlement appeared to be

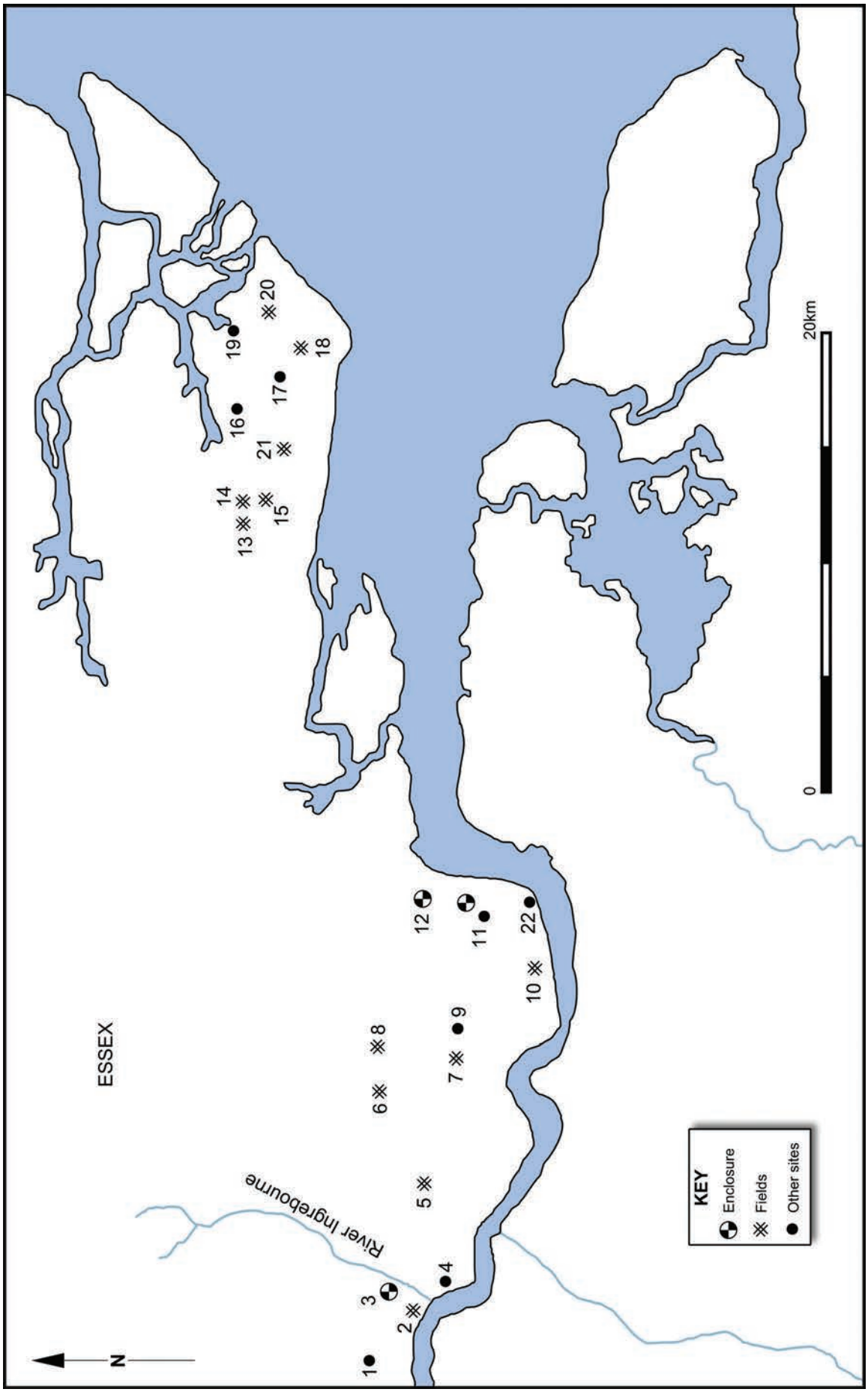

FIGURE 2: Southend on Sea peninsula and the Greater Thames estuary: Later Bronze Age fields, enclosures and droveways. . 1. Church Lane, Dagenham. 2. Bridge Road, Rainham. 3. South Hornchurch. 4. Site nine. Horndon to Barking pipeline. 5. Whitehall Wood. 6. Site five. Horndon to Barking pipeline. 7. William Edwards School. 8. Site four. Horndon to Barking pipeline. 9. Baker Street, Orsett. 10. Gun Hill. 11. Linford. 12. Mucking. 13. Eastwood. 14 and 15. Southend Airport. 16. Butlers Farm. 17. Wick Farm. 18. North Shoebury. 19. Baldwin Farm. 20. Great Wakering. 21. Prittlewell. 22. East Tilbury. Source: Yates 2007 with additions.

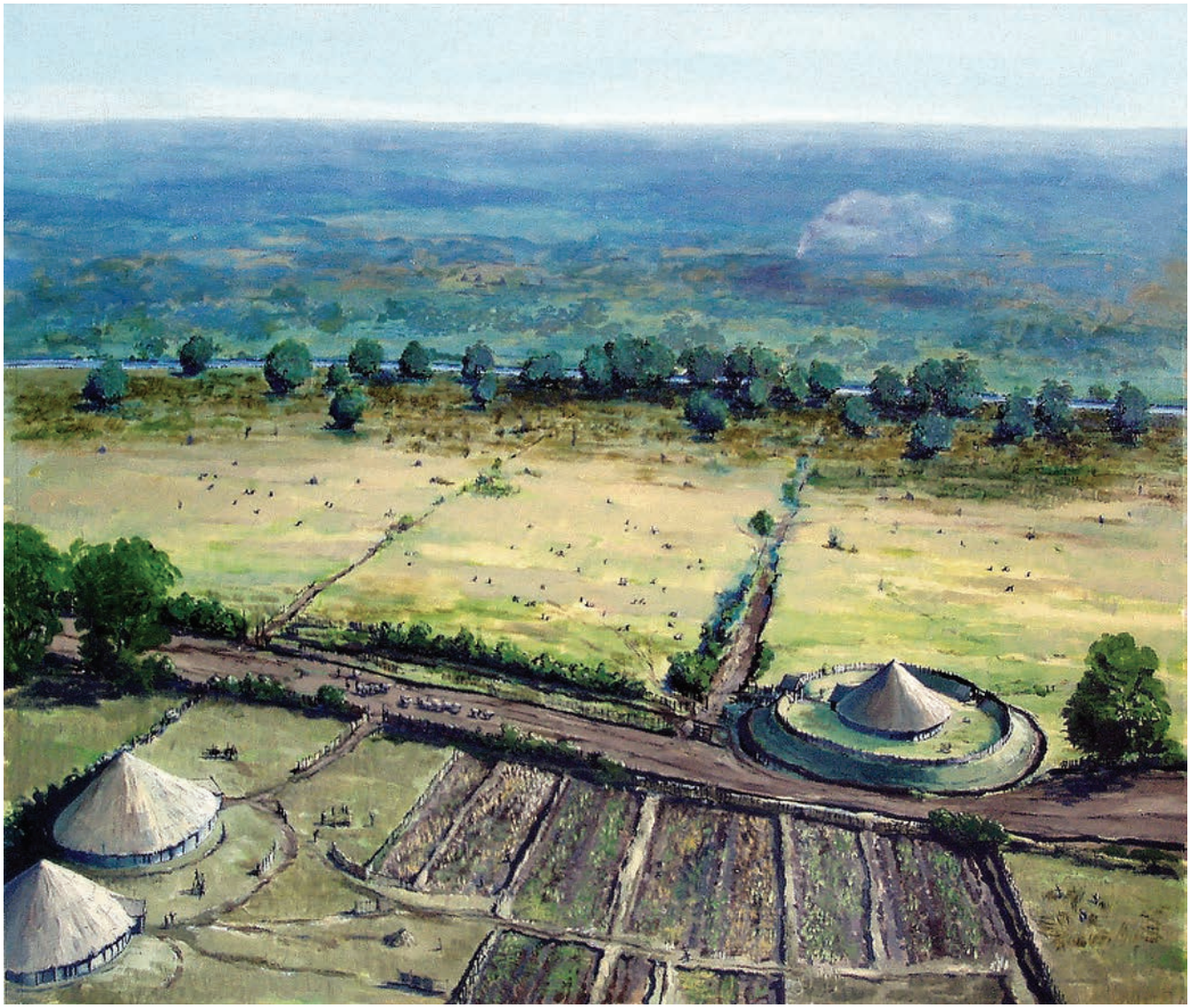

FIGURE 3: South Hornchurch Late Bronze Age ringwork and field systems. Reconstruction painting by Roger Massey-Ryan Copyright Essex County Council.

transitional into the Early Iron Age but no evidence for Iron Age occupation or cut features was found (ibid. 35)

LEA VALLEY (Figure 4)

The River Lea is the largest tributary of the Lower Thames Valley, characterised by its wide floodplain, up to three kilometres wide in London. The Lea waters provided a valued natural resource for the growing population of London. Construction of major reservoirs during the 19th century gave the first indication of the importance of this social corridor during the Bronze Age. A range of high status Later Bronze Age weaponry was discovered then, together with contemporary jetties and possible crannogs (Hatley 1933).

The recovery of an array of armoury (rapiers, swords, axes, spearheads, and a bronze shield) and human skulls (Bradley and Gordon 1988, 508) suggests that the Lea/Stort/Cam valleys could have formed a major route to East Anglia during the late second and early first millennium BC (Hatley 1933, 16. Fox 1943. Needham and Burgess 1980, 453. Couchman 1980). These river valleys linked the two politically dominant Late Bronze Age regions: the Thames and the Fens. This conclusion was based largely on the metalwork retrieved from the river before the start of developer-led excavations.

The advent of commercially-funded large area excavation has subsequently revealed evidence of settlement and land enclosure lining the banks of the Lea. One of the first significant discoveries, resulting from large area stripping, was made at the Innova Business Park in Enfield. Bronze Age trackways and fields showed how land was managed along this routeway. Field boundaries have subsequently been found close to the riverbanks in Tower Hamlets, Stratford, Enfield, Edmonton (especially the loess soils) and Chingford (Bishop 2005).

The determination to secure access to the Lea waters is shown in the brushwood trackways and jetties, found in the lower reaches. Most major projects in this part of the Lea now strike boundaries and settlements associated with Bronze Age land control. For example, excavation at the site of the Olympic Village uncovered a Bronze Age settlement. It was overlooked by a c35m diameter Late Bronze Age ringwork discovered at Leyton on the east bank (Bishop 2006). The Leyton ringwork was located on a blunt peninsula facing

directly onto the Lea valley floodplain, it was a vantage point providing extensive views both up and down the valley and across the river (ibid.12). As with other ringworks along the Thames and along the North Sea coast of Essex there is no evidence that the site continued in occupation after the Late Bronze Age.

Above Waltham Abbey (which may be the site of an aggrandiser enclosure), ribbon development continues to the north in Turnford, Wormley Wood, near to Hertford and more particularly along the Stort and on land that now forms Stansted Airport. There have been a series of large-scale excavations at Stansted Airport in a block of land lying immediately east of the River Stort (Cooke et al 2008, Fig. 2.3). The earliest evidence for permanent settlement in the area dates to the Middle Bronze Age, at a time that clearance and agricultural exploitation of the landscape in the vicinity seems to have intensified (Wiltshire 1991). There appears to have been a decline in the density of settlement activity in the Late Bronze Age leading to a hiatus towards the end of the period (Cooke et al 2008, Fig 4.2, 71). Small scale settlement of this area resumed in the Middle Iron Age (ibid 80, 281).

NW ESSEX (Figure 4)

If the River Lea was the start of a link between two politically dominant regions, what other evidence exists at the watershed of the Stort and Cam? In the north western corner of the county we enter the realm of the politically ascendant Fenlands. The headwaters of both the Rivers Stort and Cam are located in this area. The Cam drains north, through the upper chalk valleys, toward Cambridge and the Fens. The Essex National Mapping Programme has recorded a cluster of prehistoric earthworks in this area including a significant number of barrow cemeteries along the Cam valley (Ingle and Saunders 2011). That clustering of cropmarks plus the concentration of known Bronze Age metalwork (particularly Late Bronze Age finds) recorded in the Historic Environment Record shows the prehistoric importance of the northern portion of the Lea-Stort–Cam social corridor. Further north, Middle and Late Bronze Age land divisions proliferate, increasing in density as the Cam flows down to the Prehistoric Fen edge (Yates 2007, 117). The Bronze Age period in this part Essex is best understood in terms of links and connections with the Fenland communities.

RIVER RODING (Figure 4)

East of the Lea-Stort, the River Roding runs the length of the county outfalling at Barking on the Thames. Work along a 19 km stretch of the A120 between Stansted and Braintree revealed a noticeable focus of Middle and Late Bronze Age activity within the watershed of the River Roding. Middle Bronze Age features, including pits and linear ditches were recorded at three sites – North of Frogs Hall Stables, Stone Hall, and Strood Hall (Powell 2007, 20). There are the remnants of a NE–SW orientated rectilinear field system at the first site, constructed in the Middle Bronze Age and still being used in the Late Bronze Age (ibid. Fig 2.5). The second site, Stone Hall, has a scatter of Middle Bronze Age pits succeeded by a Late Bronze Age rectilinear field system and an integrated droveway (ibid. Fig 2.8). A number of human cremations were buried within the enclosed farmlands, all dateable to the start of the first millennium BC (ibid. Table 2.5). At the final site in this

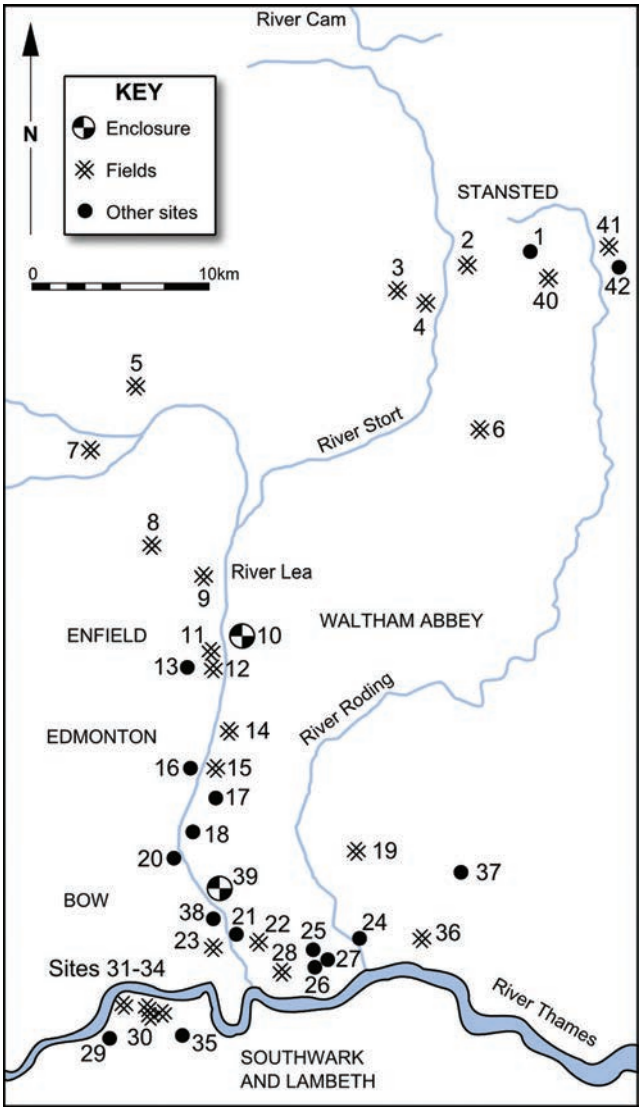

FIGURE 4: River Lea, Stort and Cam.
1. Stansted Airport. 2. Dunmow Road, Bishops Stortford. 3. Thorley. 4. Thornbera Road, Bishops Stortford. 5. SW of St John's Wood, Hertford. 6. Hatfield Heath to Matching Tye Rising main. Sites 31 + 35. 7. Cole Green Bypass. 8. Wormley Wood. 9. Canada Field, Turnford. 10. Waltham Abbey. 11. Rammey Marsh. 12. Innova Science Park, Enfield. 13. Aylands Allotments. 14. Chingford. 15. Montague Road, Enfield. 16. Plevna Road, Enfield. 17. Banbury Reservoir. 18. Maynard reservoir, Waltham Forest. 19. Former King George V Hospital, Newbury Park. 20. Warwick reservoir. 21. CTRL, Stratford New Town. 22. Stratford market depot.23. Old Ford, Bow. 24. Movers Lane, Barking (A13). 25. Vicarage Primary School, Newham. 26. Woolwich Manor Way, Beckton (A13). 27. Golfers Site, North Beckton. 28. A13 Prince Regent Lane (A13). 29. Vauxhall Bridge. 30. 99–101 Waterloo Road, Lambeth. 31. Bermondsey Abbey. 32. Phoenix Wharf,Bermondsey. 33. 10–16 Lafone Street. 34. Wolseley Street. 35. Bramcote Grove, Bermondsey. 36. Hays, Dagenham. 37. Dagenham Heathway. 38. Olympic Village. 39. Leyton ringwork. 40. North of Frogs Hall (A120). 41. Stone Hall (A120). 42. Strood Hall (A120).
Source: Yates 2007 with additions.

watershed, Strood Hall, fragments of copper alloy together with Middle Bronze Age pottery were retrieved from a pair of overlapping linear features (ibid. 23); residual Late Bronze Age sherds were found in adjacent but later features (ibid. 33). Cropmarks plotted under the National Mapping and Portable Antiquity Scheme findspots along this watercourse (www.finds.org.uk) show the potential for further Roding valley fieldwork. It suggests that the Roding, as with all the major rivers in Essex, was a natural routeway connecting far-flung communities.

THE BLACKWATER ESTUARY (Figure 5)

Switching to the North Sea coast, we encounter the Lower Blackwater estuary, an area with the largest concentrations of cropmarks in Essex (Ingle and Saunders 2011). The freshwaters pouring out to sea come from a myriad of waterways draining down from the boulder clays inland. The hydrology is dendritic (treelike) in structure and this pattern influenced settlement, formal farming and metal deposition. Communities were drawn into a wide ranging and interdependent exchange network. Land pressures were particularly intense around the mouth of the Blackwater. A number of key sites within this Late Bronze Age landscape overlooked the estuary: Slough House Farm, Chigborough Farm, Rook Hall, Tolleshunt D'Arcy and Heybridge Basin. They suggest a remarkable degree of land pressure, with an implication that people were marshalling livestock by the coast (Yates 2007, 74). A particular form of Late Bronze Age sub-rectangular enclosure, directly involved with livestock rearing, was found in this zone at Lofts Farm (Brown 1988). The enclosure there would have enabled the community to exploit the grassland of the surrounding gravel terraces along with the pasture fringing the Blackwater estuary (ibid, 295).

Inland a series of river valleys branch off from the Chelmer and Blackwater, providing access to the interior of Essex. Such river corridors were repeatedly the focus for settlement and communications in south east England throughout the Middle and Late Bronze Age (Yates 2007). It is in the Chelmer Valley that new forms of Late Bronze Age settlement/architectural creations have been found. Two "partner" ringworks dominated this social corridor. The Great Baddow enclosure may have commanded inland views to the west, whilst Springfield Lyons offers command of land to the east – out towards the Sea.

Springfield Lyons ringwork lies on a slight promontory providing extensive views to the east across one of the widest parts of the Chelmer floodplain (Brown 2001, 93). Brown argues that the choice of its location was connected to the existence of the remains of a Neolithic causewayed enclosure (ibid.97). This association may have been a means of emphasising the past for social and political advantage (ibid 97). The argument is more compelling after a similar discovery at Kingsborough Farm on the Isle of Sheppey. At this site in Kent, a Late Bronze Age enclosure was carefully placed between two Neolithic causewayed enclosures, the remnants of which would still have been visible (Allen et al 2008, 284). The Late Bronze Age ringwork was of a similar size to both Neolithic enclosures and may have been a bid to legitimise political power; an attempt to re-assert genealogical origins in order to underpin new patronage relationships (Yates 2007, 126).

Recent excavation indicates the presence of extensive Late Bronze Age occupation and fields contemporary with the Springfield Lyons ringwork (Brown 2001, 97). On the eastern edge of Springfield Lyons promontory, open animal corrals have been discovered one hundred metres away from the enclosure at Springfield Park (Manning and Moore 2004, 21 and 26). Stock raising appears to be restricted to a single, rapid phase of activity with a date range in the 10th or 9th centuries BC (ibid 26). It falls within the start and end dates of the Springfield Lyons enclosure which had been occupied throughout the tenth and ninth centuries cal BC and probably throughout the eleventh century as well. Environmental sampling at Springfield Park produced only small quantities of charred cereals, again indicating that the Chelmer valley had a predominantly pastoral political economy (ibid 26).

An arc of metalworking appears to delineate an outer boundary to the Springfield Lyons ringwork (Buckley, Brown and Greenwood 1986, 263). It is the same pattern of placement observable at the great ringwork of Queen Marys Hospital at Carshalton (Yates 2007 Fig 12.5). Metalworking evidence is not confined to this outer boundary, for the largest sword mould assemblage in the country had been buried in the enclosure ditches at Springfield Lyons.

West of Chelmsford and north of Maldon a series of rivers and brooks branch out into the Essex interior. These natural communication corridors were once thought to be the focus for open farming rather than the formal land divisions often found on prime land flanking major river mouths (*cf* Yates 2007, 77). Excavations along the A120 have changed that interpretation. It is now clear that regimented farms were also created much further inland. That is the case within the Roding watershed discussed earlier in this paper. It is also true of the streams and brooks which form part of the Chelmer/Blackwater water catchment zone.

It appears that during the Middle Bronze Age there was quite intensive exploitation of land within easy reach of the two parallel watercourses of the Roding and the Chelmer (Powell 2007, 26). Far more Late Bronze Age sites were found along the A120 roadworks than Middle Bronze Age ones, particularly within the River Chelmer catchment. At Great Dunmow Round House, sections of linear ditches (one of which contained post-Deverel Rimbury ware in its base) were recorded close to a feeder stream to the Chelmer (ibid. 35). Another fragment of a possible Late Bronze Age rectilinear field system on the same ENE–WSW alignment was discovered immediately east at West of Ongar Road, again overlooking the same feeder stream (ibid. 35).

Over the course of the 19km road corridor, Middle/Late Bronze Age field systems/droveways were discovered at five sites. Such inland finds at first seem to contradict the model that conspicuous regimented landscapes are confined to coastal/river social corridors. Or does it? The remarkable thing is that all the sites were confined to a narrow neck of land separating the Roding and the Chelmer; three sites within the Roding watershed and two on the west bank of the Chelmer. From this point the river courses diverge – the Roding heading due south and the Chelmer tracking eastward. It suggests that these farms deep inland, were connected with both the Thames and the North Sea.

There is other evidence from the A120 roadworks showing a connection between inland sites and ones nearer to the coast.

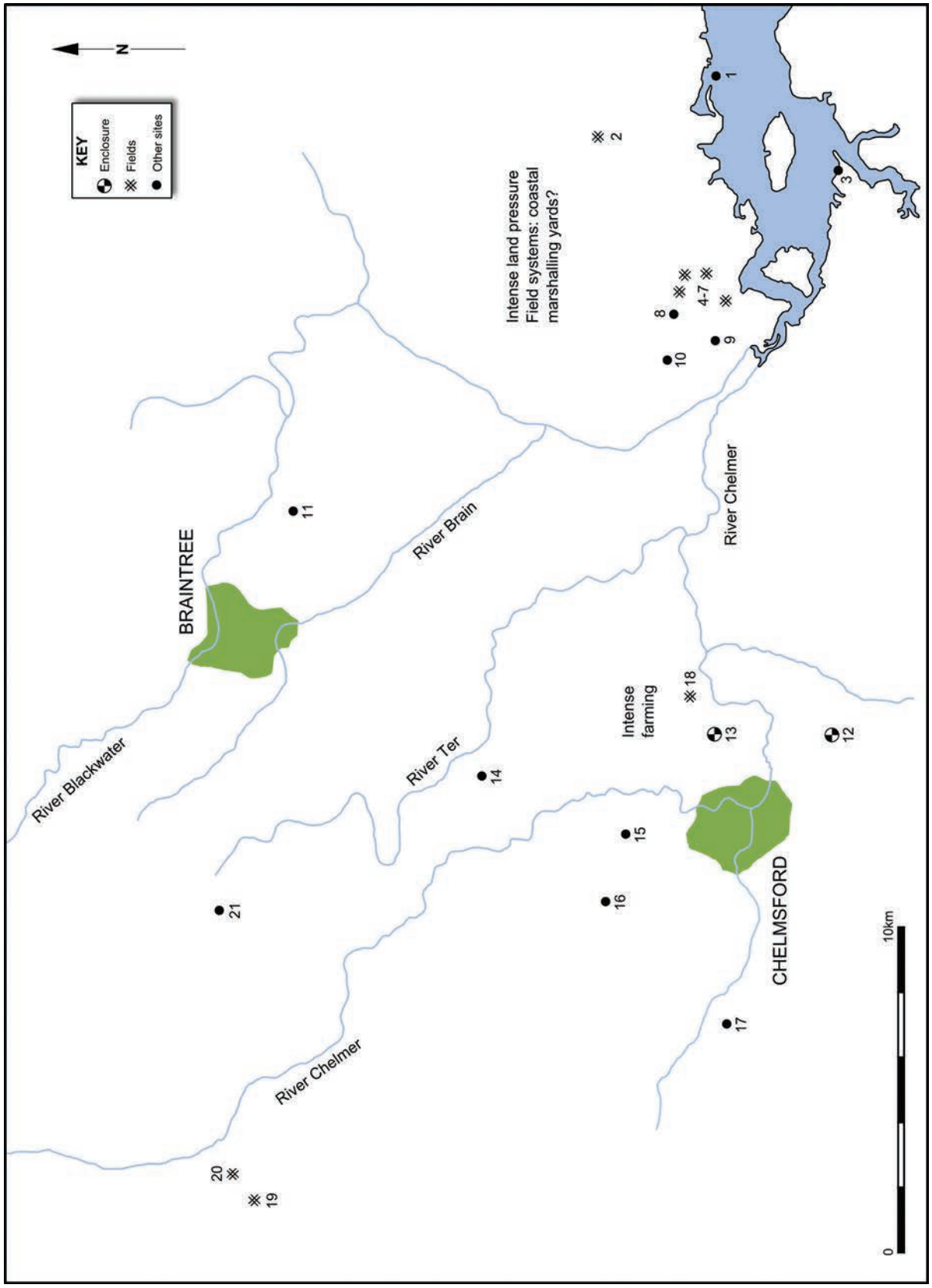

FIGURE 5: The Chelmer and Blackwater. 1. Rolls Farm. 2. Hill Farm, Tolleshunt D'Arcy. 3. Blackwater site three. 4. Chigborough Farm. 5.Rook Hall Farm. 6. Slough House Farm. 7. Blackwater Sailing Club, Heybridge. 8. Lofts Farm. 9. Crescent Road. 10. Howell's Farm. 11. Bradwell. 12. Great Baddow. 13. Springfield Lyons. 14. Little Leighs. 15. Windmill Field, Broomfield. 16. Broads Green. 17. Roxwell Quarry. 18. Springfield Park. 19. Great Dunmow Round House (A120). 20. West of Ongar Road (A120). 21. Greenfields (A120). Source: Yates 2007 with additions.

By far the most important Middle Bronze Age discovery in this civil engineering project was made at a site called Greenfields, sited on a spur of land flanked by the Stebbing Brook to the west and the start of the River Ter to the east. Both flow south to join the River Chelmer.

A natural hollow, which had some lasting symbolic significance within the landscape, became the focus for structured deposition starting in the Middle Bronze Age. A complete Middle Bronze Age vessel containing a piece of copper alloy scrap had been buried in an adjacent pit (Powell 2007, 38). Subsequently formalised depositions included over 500 fragments of clay casting moulds used in sword manufacturing within the Ewart Park tradition of the 9th to 8th centuries BC (ibid 39). A copper alloy fragment together with 89 post-Deverel Rimbury pottery sherds was retrieved from an adjoining small pit (ibid 40). The site is significant in two respects. First, it is a rare discovery of *in situ* metalwork and casting moulds. Secondly it suggests a link to another site much further downriver. Springfield Lyons ringwork overlooking the Chelmer is also associated with a large assemblage of Ewart Park tradition sword casting moulds and like Greenfields, the material was deliberately selected for deposition and was not a general dump of metalworking debris (Powell 2007, 39. Buckley and Hedges 1987). Possibly such metalworking deposition was referencing the river systems, linking and connecting extended social groupings.

TENDRING (Figure 6)

We now move further up the North Sea coast toward the Tendring peninsula and Suffolk. The River Colne runs through Colchester and the distribution of finds including metalwork suggests fairly dense occupation in the Bronze Age. The large ring ditch barrows at Sheepen, Lexden and Chitts Hill and their associated artefacts imply high status residents. As elsewhere in Essex, this level of Bronze Age activity is not sustained into the Early Iron Age (Davies 1992, 7).

It is not just the size of individual Bronze Age barrows which shows the importance of the River Colne valley; the Essex National Mapping Programme has recorded a profuse number of funeral monuments, increasing in density toward the river mouth. Two barrow cemeteries in this area have been excavated and published in recent years. The first, Moverons Farm lies on the Brightlingsea Peninsula overlooking the Colne estuary. Several hundred people appear to have been interred here, mainly between 1600 to 1300 cal BC (Clarke and Lavender 2008, 57). It appears that pasture or arable land was chosen for the cemetery and taken out of agricultural use (ibid. 61). The fertile brickearths on this peninsula were subsequently enclosed by a field system in the Late Bronze Age. Concentrations of burnt flint and worked flint scatters are associated with the Later Bronze Age excavated sites (ibid. 2008, 22).

Five kilometres away there is another Middle Bronze Age cemetery at Lodge Farm situated on a similar low lying spur; this time above the St Osyth Creek. Again it was a tightly packed ring-ditch cemetery with Ardleigh style cremation vessels (Germany 2007). Unlike Moverons Farm, Late Bronze Age evidence is lacking here. But it too has no signs of any Early Iron Age activity. These two cemeteries, together with those at Chitts Hill and Ardleigh all occur in prominent locations along the River Colne and its tributaries. There is another river grouping within the Tendring peninsula focused on the Holland Brook, again at prominent locations (Little Bentley, Little Bromley and Thorpe-le-Soken). Mark Germany therefore observes that each Ardleigh type cemetery is river orientated (ibid. 2007, 113), each flowing out and linking them to the sea.

The Tendring plateau occupies much of the peninsula and the soils are fertile and well drained. Some of the most extensive cropmark complexes anywhere in the county can be found here and the landscape is especially rich in linear boundaries (Ingle and Saunders 2011).Within the Tendring peninsula agricultural landholdings are well represented in the archaeological record with the discovery of Bronze Age field systems at Hill Farm, Vince's Farm and Martell's Quarry (Yates 2007, 79). To this list, can now be added the recent finds from Jaywick Road at Clacton-on-Sea., where a section of a north-west to south-east aligned ditched droveway and a possible associated watering hole were discovered. Material recovered from the fill of these features suggests a Late Bronze Age date (Letch 2005, 57–58 and 69).

Finally there is the River Stour valley which has a high concentration of barrow cemeteries along the valley from Lawford (Strachan, Brown and Knopp 2000). Late Bronze Age field systems are located at the river mouth and Late Bronze Age metalwork has been found along the estuary foreshores. Heading further north along the North Sea coast, evidence of regimented fields systems diminishes as the great conduit of the Thames becomes more distant.

CONNECTING

The European Bronze Age is characterised by extended inter-regional exchange networks. Communities were inter-dependent, sharing a common fortune. The exchange networks were extensive and not confined by present day administrative County boundaries. For example, Peter Clark has shown the strong similarities between Middle Bronze Age settlements in Kent and those in the Pas-de-Calais (Clark 2004a, 2004b). The sea was not a barrier but a key link to a wider world. With its marine access to communities across the North Sea and to the Continent via the Dover Straits, the priority in Essex should be to look at the flow of people back and forth. Evidence for migration into and within the eastern lowlands of England is an important issue, difficult to address but not beyond enquiry. Common cultural traditions (architecture, ceramics and funerary monuments) may offer clues but the trace element examination of skeletal bone (rare though it is) may reveal the mobility of particular peoples, their origin and where they lived during their lives.

Developer-led excavation, involving large area stripping, provides an insight into the way land in Essex was managed at this time. The focus is on the coastal, riverine and watersheds just as it is in neighbouring Kent where extended and distant communities were linked within the tree like (dendritic) communications network of river systems.

The construction of the regimental rectilinear field systems created a gridded terrain and the fashion for this type of land use together with the circular enclosures or ringworks shows a remarkable degree of conformity. They may have been emblems of affiliation to extended inter-regional exchange (Yates 2007, 135). Developer led excavation on the gravel terraces around Heathrow Airport, showed that up to 150sq

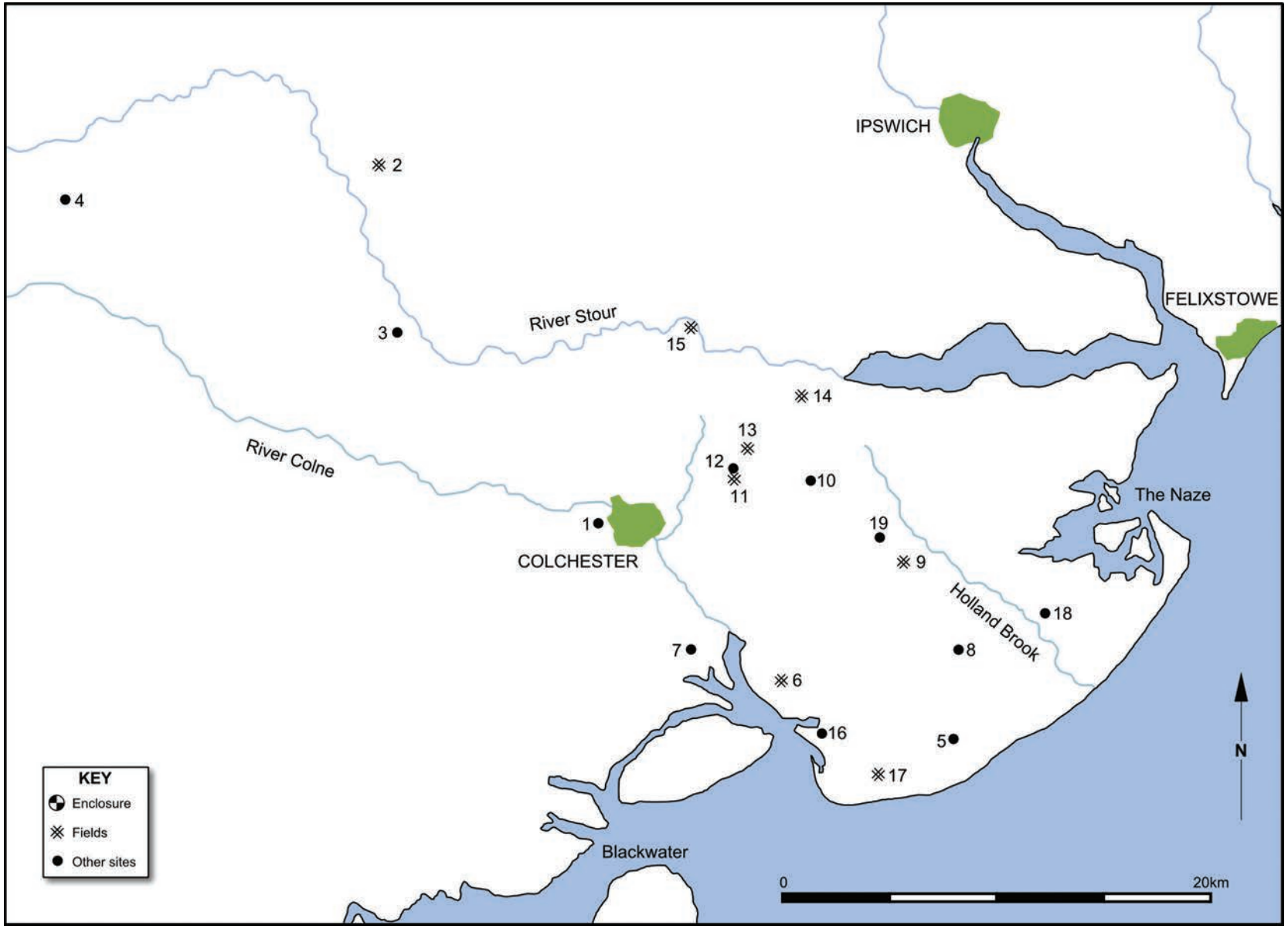

FIGURE 6: Colchester to Felixstowe. 1. Colchester (Lexden, Sheepen, Chitts Hill). 2. County Farm. 3. Ferriers Farm. 4. Ridgewell Hall. 5. Rush Green, Clacton. 6. Moverons Farm, Brightlingsea. 7. Frog Hall Farm, Fingringhoe. 8. Montana Nursery, Little Clacton. 9. Hill Farm, Tendring. 10. Little Bromley. 11. Martell's Quarry. 12. Martells Hall. 13. Vince's Farm, Ardleigh. 14. Lawford. 15. Langham. 16. Lodge Farm. 17. Jaywick Lane. 18. Thorpe-le-Soken. 19. Little Bentley. Source: Yates 2007 with additions.

km of land was possibly enclosed during the Middle and Late Bronze Ages (Yates 2007, 32). The scale of enclosure being exceeded on Salisbury Plain. The potential magnitude of co-axial field systems should not be underestimated in future fieldwork. Such monumental land grids drew people into a wider world of exchange and social interaction.

There would have been a marked degree of fluidity in political fortunes and power within the South East. The challenge in future commercial work will be to strive for even greater chronological precision in order to chart the non-synchronous development and eventual demise of Bronze Age field systems and their attendant infra-structure. That challenge will be more immediate in Essex as parts of the Bronze Age coastal legacy is likely to be obliterated by rising sea levels. Monitoring work at Rolls Farm in the Blackwater estuary has already shown the pace of destruction caused by the onset of marine inundation (Heppell 2003).

DISCONNECTING

The wealth of data emerging in British commercial archaeology shows a marked contrast between the level of Early Iron Age activity and that of the Middle and Late Bronze Ages. A pattern of apparent social dislocation in the Early Iron Age, after a prolonged epoch of prosperity, is repeated throughout the counties in the South of England. Successive synopses of the evidence for Essex have supported this interpretation (Bradley 1996, Yates 2001 and 2007) and recent excavations covered in this paper do not alter that conclusion. One excavation transect traversing the county provides particular support. If we combine the findings from the excavations at Stansted with the discoveries along the A120 roadworks we have the benefit of a 20+ km long east–west sample through the county, from the River Lea/Stort/Cam corridor east to Braintree (Timby et al. 2007).

The general findings from the A120 works show a steady expansion of settlement and land division in the Late Bronze Age which comes to an abrupt end. There is little evidence that this process of intensification continued in the Early Iron Age (Powell 2007, 45).The only clear evidence of Early Iron Age activity along the entire 19km course of the roadworks comes from a 16m³ pit found West of Strood Hall (ibid Fig 2.2). That paucity of EIA activity was also encountered at Stansted Airport. Despite excavating 34 hectares at the airfield , little Early Iron Age activity was observed with only a series of small pits scattered in a thin distribution over the landscape noted (Cooke et al. 2008, 77). A short portion of a ditch boundary was found (ibid 73) but houses and waterholes were absent and possibly the woodlands and scrublands were left to regenerate (ibid 73, 77. Carruthers 2008).

Greater chronological precision is needed to understand the Late Bronze Age – Early Iron Age transition. Current ceramic categorisation is in need of reassessment nationally and that may affect regional interpretations at the end of the Bronze Age epoch. At Stansted, for example, there were difficulties in establishing a coherent chronology for the Late Bronze Age/Early Iron Age periods (Cooke et al 2008, 72. Leivers 2008). A problem that hampers Essex fieldwork.

The need to integrate palaeo-environmental analysis in commercial contracts is also vital throughout the South East of England. It can provide the means of identifying a) signs of scrub regeneration associated with a farming decline and b) any markers of climatic deterioration at the end of the Bronze Age (David Dunkin pers. comm.).

For over eight hundred years, between 1500–700BC, there was a remarkable era of economic expansion which was dependent on participation in a larger continental network of alliances and exchange. The future challenge, in understanding the development and demise of the political economies which sprang up during this epoch in the eastern lowlands of England, will be to improve on the sometimes sketchy chronology. The new Regional Research Framework (Medlycott 2011) is a major step in that direction.

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The Iron Age of Essex Revisited

By Paul R. Sealey

Abbreviations: BA, Bronze Age; EROM, early Roman; IA, Iron Age; LBA, late Bronze Age; LIA, late Iron Age; MIA, middle Iron Age; and PDR, post-Deverel-Rimbury

INTRODUCTION

In an earlier survey of the IA of Essex, the writer attempted something approaching comprehensive coverage of the topic (Sealey 1996). This update is more limited and specific in its scope because the intention is only to highlight significant discoveries and research since the Writtle conference of 1993. The emphasis here therefore is on what we now know that we did not know then, and on how new discoveries and research have changed the picture (Figure 1).

The Essex addressed is the historic county, with its western boundary on the river Lea in what is now Greater London. Reference is sometimes made to East Anglia. It should be borne in mind that the term is used here in its correct and technical sense to denote the region that was once the kingdom of the East Angles (Norfolk, Suffolk and adjacent parts of Cambridgeshire), and not the whole tract between the Wash and the lower Thames *i.e.* Essex is not part of East Anglia.

ASPECTS OF METALWORK, CHRONOLOGY AND TECHNOLOGY

The New Start Date for the Iron Age

At the time of the Writtle conference in 1993 it was felt that the introduction of iron made most of the existing stocks of bronze redundant, and that this accounted for the burial of so many hoards of scrap metalwork in the Ewart Park phase of the LBA. Scholarship still subscribes to this explanation of the hoard record but there has been a major change in views on chronology because the radiocarbon dating of wood associated with Ewart Park metalwork suggests the peak in hoard deposition came *c*. 800 BC (Needham *et al*. 1998, 76–80, 82, 93–8), and not (as hitherto thought) a century later, *c*. 700 BC. This put the adoption of iron at a time when the pottery in use was still thought of as LBA. This new and early date for the introduction of iron involved major dislocations to our terminology and conceptual frameworks, and it took some years for a new scheme to emerge (Needham 2007).

The new scheme is given in outline in Table 1. Starting the IA *c*. 800 BC means that the adoption of the new metal fell when what we used to call LBA or PDR decorated pottery was current. Such pottery emerged *c*. 850 BC and remained in use until the appearance of Darmsden–Linton pottery *c*. 600 BC. Henceforth we shall have to think of this PDR decorated pottery as earliest IA instead of latest BA. It developed organically from the LBA or PDR plain ware dated *c*. 1150–850 BC. It can be difficult to tell if any given assemblage is plain or decorated PDR pottery (especially if it is a small group) because there can be sporadic decoration on plain ware, and even in decorated assemblages the proportion of sherds with decoration is low. At the Mucking North Ring (for instance), only a fifth of the rims in a developed decorated group are decorated (Barrett and Bond 1988, 28). Quantified data on the incidence of decoration on body sherds is apparently not available, and this gap in knowledge needs to be rectified.

In the past when excavation reports have spoken of LBA pottery, the authors had in mind the predominantly flint-tempered wares current *c*. 1150–600 BC. Needham suggests we now refer to those centuries as late Bronze Age–earliest Iron Age. Earliest IA covers the period *c*. 800–600 BC when what we used to call LBA decorated ware (PDR decorated pottery) was current. He further suggests we use the formula 'late Bronze Age/earliest Iron Age' for the period *c*. 850–750 BC when we are talking of the century or so when iron displaced bronze as the staple metal for tools. The subsequent period – with IA pottery of Darmsden–Linton type *c*. 600–350 BC – becomes the 'early Iron Age' (Needham 2007, 40–41, 55).

We shall have to bear in mind that the expression 'late Bronze Age' meant something rather different before the current Needham terminology. There are real possibilities for confusion, and in future great care will have to be taken to make quite sure we are clear what any given text means by the expression. We also need to keep in mind that the Needham late Bronze Age–earliest Iron Age covers a time span of upwards of half a millennium. Bearing in mind the length of time involved, every effort should be made to try and identify trends that might allow the recognition of stages in the ceramic sequence (Needham 2007, 42).

Metal in Essex in the Earliest and Early Iron Age *c*. 800–350 BC

Now that ironworking is thought to have been introduced by the end of the Ewart Park phase of the LBA *c*. 800 BC, the succeeding Llyn Fawr phase (the earliest IA) is seen in a different light. It used to be thought of as the culmination of the mature LBA and to represent a valid phase of BA metalworking in its own right, a view still advocated by O'Connor (2007). What one feels will become mainstream opinion sees it instead as an anachronistic postscript to the BA at a time when iron was already in the ascendant (Needham 2007).

In Essex, bronze metalwork of Llyn Fawr type is rare. Unlike East Anglia, there are no Llyn Fawr hoards in Essex (O'Connor 2007, fig.1). The East Anglian hoard concentration would have been even more striking if O'Connor had included the Cringleford (Norfolk) axe hoard (Lawson 2000a; 2000b) and the Undley (Suffolk) chape hoard (Pendleton 1999, 127, fig.14). No iron or bronze that can be allocated to the Earliest IA has in fact come to light in Essex since the Writtle conference. Indeed, there are apparently only two metalwork items of the *c*. 800–600 BC Llyn Fawr phase from Essex. The first is a bronze Sompting axe from the Lea marshes at Walthamstow published as a drawing in the frontispiece to Hatley (1933), with its subsequent publication by Brailsford (1953, 26, fig.7 no.6) drawn to my attention by M.J. Brudenell. The second is a bronze sword from the foreshore at West Mersea (Brown 1986; Wilkinson and Murphy 1986, 188, 190). It is a Thames weapon, that is to say a late Ewart Park sword made under strong Gündlingen influence and which should therefore

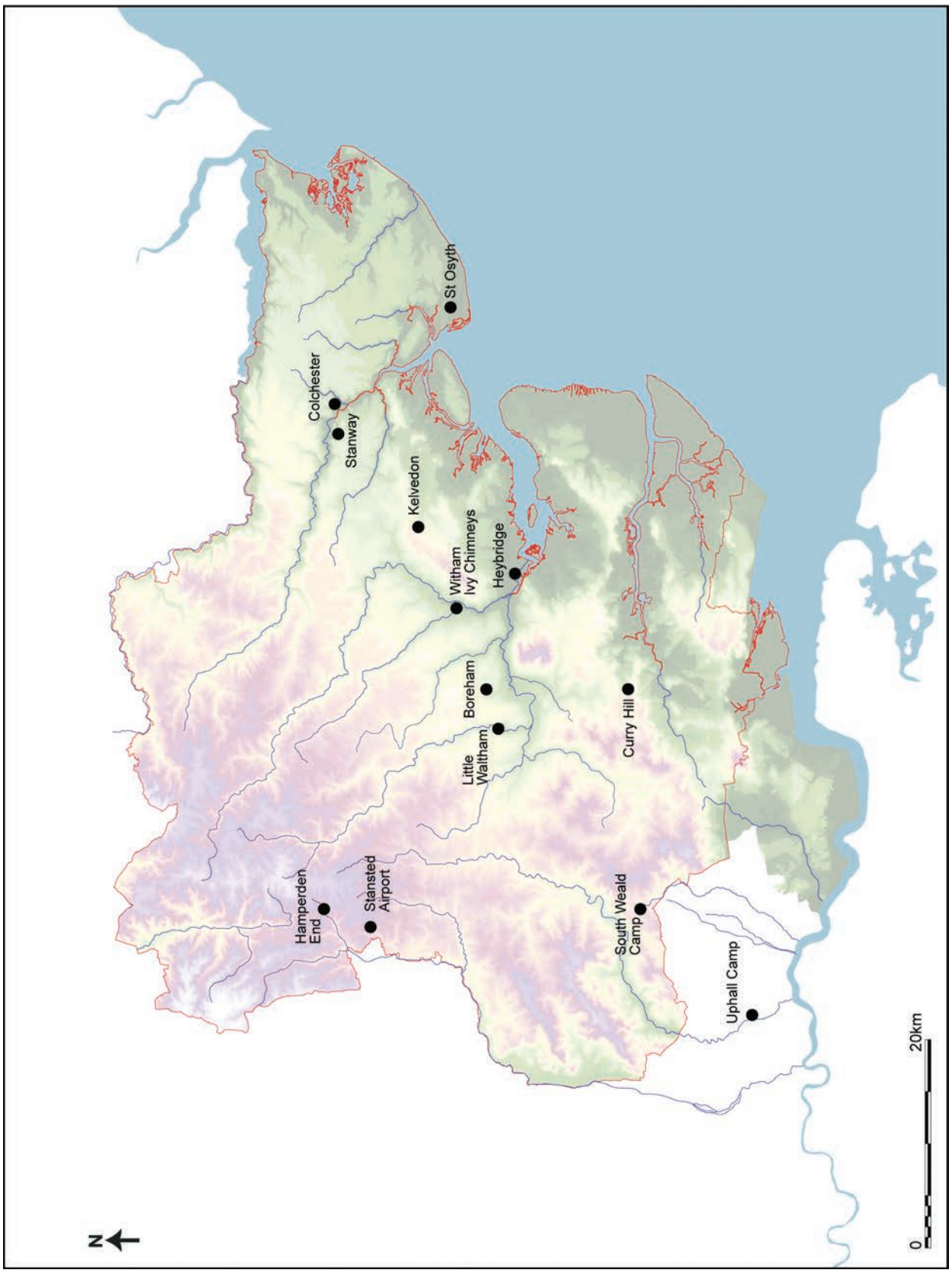


FIGURE 1: Selected Iron Age sites mentioned in the text © Crown copyright. All rights reserved. Essex County Council 100019602, 2013

Date	Period	Pottery	Metal phase	Metal use
c. 1150-800 BC	Late Bronze Age	Post-Deverel-Rimbury plain ware, otherwise known as late Bronze Age plain ware, with decorated ware emerging from *c*. 850 BC	The Wilburton phase *c*. 1140-1020 BC, followed by the Ewart Park phase *c*. 1020-800 BC	Developed Bronze Age at the start. Iron introduced towards the end, replacing bronze as the staple metal from *c*. 850-750 BC leading to the deposition of many bronze scrap hoards at the same time in what is now termed the late Bronze Age/earliest Iron Age.
c. 800-600 BC	Earliest Iron Age (note the use of 'earliest'), formerly these centuries were thought of as part of the late Bronze Age	Post-Deverel-Rimbury decorated ware, formerly thought of as part of the late Bronze Age ceramic sequence but now styled earliest Iron Age pottery	The Llyn Fawr phase of bronze metalworking contemporary with Hallstatt C, marking the start of the Iron Age	Gold disappears. Rapidly declining use of bronze as iron takes over. Finds of all metals are rare as limited stocks of iron discourage ritual discards and use as grave goods. Dwindling use of bronze for votive deposition as the ideological value of the metal slumps. Bronze is retained for such things as cauldrons and buckets
c. 600-350 BC	Early Iron Age, note the different use of 'early' and 'earliest' in this column	Darmsden-Linton pottery in Essex, south Suffolk and adjacent parts of Cambs but not elsewhere	Developed Iron Age, with Hallstatt D *c*. 600-475 BC	Iron now the staple metal for artefacts but they are still rare in the archaeological record because iron stocks remain too limited for much in the way of ritual discards and grave goods. Rigorous recycling leaves little iron to feature as casual losses on sites

(based on Needham 2007).

TABLE 1: The new look for the late Bronze Age and the start of the Iron Age

date *c*. 800–750 BC (Colquhoun and Burgess 1988, 74–5, 112, 115; O'Connor 2007, 74). Its deposition, complete in a watery context, exemplifies the continued use – at least for a time – of bronze for votive offerings (Colquhoun and Burgess 1988, 75; Needham 2007, 51).

The dearth of iron in earliest IA contexts (let alone those of LBA date) can readily be accounted for by the precious character of the new metal. That would have discouraged ritual discards of iron and encouraged comprehensive recycling of what little iron there was. Iron only entered the archaeological record when stocks had reached sufficient levels for ritual discards, deposition in graves or casual losses on settlement sites to take place. The problem is exacerbated by the difficulty of recognising stray finds of early iron without archaeological context for what they are (Needham 2007, 49–52).

What might be one of the earliest signs of ironworking in Essex comes from the MTCP site at Stansted airport and takes the form of hammerscale in Pit 340004 associated with flint and sand-with-flint tempered pottery described as *c*. 800–400 BC transitional LBA to early IA ware (Brown and Leivers 2008, 71–2; Keys 2008, 16.1; Leivers 2008, 17.27). Our earliest iron artefacts *per se* are the contents of a neglected hoard from Pit CF101 at Orsett consisting of a ring-headed pin and six plain rings, two of which are penannular. Associated pottery is Darmsden–Linton. An adjacent pit with similar pottery had another iron ring. There were no carinated fine ware bowls in the associated pottery and the *illustrated* sherds are almost entirely flint-tempered. This suggests a date at the start of the Darmsden–Linton sequence *c*. 600 BC (Hedges and Buckley 1978, 291, fig.45 nos 2–9 for the iron; Barrett 1978, 284, fig.42 nos 75–107 for the pottery). Another early find of iron is the bar associated with developed Darmsden–Linton pottery on the SCS site at Stansted airport (Major 2004a, 33; Brown 2004, fig. 33 no.36 & fig.36 nos 44, 50 & 58 for the pottery).

Aspects of Iron in the Middle and Late Iron Ages

Finds of iron remain few and far between in Essex, even in the last three or four centuries of the IA. Assembling data on

finds of the metal from all contexts would be a useful exercise for scholarship in the future because it might give us an insight into the availability of iron at different stages of the period and in different parts of the county. The earliest find of the metal in a grave is a pair of iron penannular brooches from a fourth-century BC ring-ditch at Boreham associated with MIA pottery, kindly shown me by Mark Germany and Joyce Compton. In the second century BC we have a hoard of two iron currency bars from Stanway. They had been placed horizontally in the middle fill of an enclosure ditch. Boundaries like the Stanway enclosure ditch were often a focus for the ritual deposition of material without intention of recovery (Crummy *et al*. 2007, 26–7; Hingley 2005; 2007). One had no reason to expect finds of the iron currency bars found in the West of England to turn up in Essex, and the Stanway hoard was a surprise. But the find is not as isolated as it might at first appear because two currency bar hoards have been found in south Cambridgeshire, at Huntingdon (Hingley 2006, 246) and in a tributary of the river Cam between Grantchester and Haslingfield (de Jersey 2000a, 3–4). Iron is present in some quantity in Essex in the *c*. 75–25 BC warrior burial from Kelvedon, (Sealey 2007a) but finds of the metal on settlement sites remain few and far between. All that survived from the large MIA village at St Osyth was one tiny iron awl (Major 2007, 77). This dearth of iron makes the large first-century BC assemblage from the ACS village at Stansted airport all the more exceptional. Including brooches, there were no less than 133 iron objects, as well as two iron nails (Major 2004d, 133–5). One wonders if it means the village was abandoned in haste, with the villagers fleeing and leaving their possessions behind them.

Flint Working in the Iron Age

The discussion of metal technology in the preceding sections leads to the vexed question of flint utilisation in the IA. The topic of flint use then is one that arouses strong feelings, with the consensus of opinion against it. Nevertheless, there is a growing body of evidence in support. Technically, IA flint utilisation has now become legitimate simply because the transfer of PDR decorated pottery and associated contexts from the LBA to the earliest IA has taken LBA flint artefacts with them. It is flint from later periods of the IA that concerns us here.

Flintwork in early to MIA contexts has traditionally been viewed as residual, and so the case for *bona fide* IA flint utilisation has to be based on assemblages where residuality can be eliminated. Just such an assemblage came from the Essex site of Birchanger where the pottery was predominantly MIA with only a little earlier flint-tempered ware present (Young and Humphrey 1999, 234–5; Humphrey and Young 2003, 80 citing Austin 1994). Since then flint of IA date has been published from the Stanway site at Colchester, where it was also apparently MIA (Martingell 2007). Indeed ten of the ninety-seven sites with *potential* evidence of flint use in the IA listed by Humphrey (2007, 155–6) are in Essex. Enough is known now of IA flint utilisation to attempt a characterisation (*ibid*., 145). Assemblages are small, and made of local flint. There is a restricted range of tools; and those present were made with limited expertise, often with a hammerstone. The typical IA flint tool is the squat flake (Martingell 1990; 2003, 91, 93).

POTTERY AND THE CERAMIC SEQUENCE

Earliest and Early Iron Age Pottery *c*. 800–350 BC

Needham (2007, 48) suggested that the pottery from the enclosure at Broomfield (Brown 1995a) marks the transition from PDR plain to PDR decorated wares. If so, it should stand at the start of what we now regard as the earliest IA pottery in the county. Pit M330 at North Shoebury had an interesting assemblage of what is apparently a more developed stage of decorated PDR pottery (Brown 1995c, 80, fig.63 nos 49–59, 83). A large assemblage from context 2171 on the SCS site at Stansted airport marks the transition from PDR decorated ware to the Darmsden–Linton pottery style. It comes with a radiocarbon date of cal. 760–520 BC at the one sigma level. Bearing in mind the presence of a Darmsden–Linton style pedestal base, it may well belong towards the end of that date range (Brown 2004, 41, fig.30 nos 5–14).

A very large and important assemblage of Darmsden–Linton pottery weighing 80kg has been published from the SCS site at Stansted airport (Havis and Brooks 2004a, 23–4; Brown 2004, 41, fig.31 nos 19–23, figs 32–5, fig.36 nos 42–61). It came from a series of intercutting pits with a calibrated radiocarbon date of 518–384 BC at the two sigma level. The date fits well with the typology because the lack of decoration on the fine ware bowls anticipates MIA plain wares and suggests the pottery lay towards the end of the Darmsden–Linton sequence. A selection of Darmsden–Linton pottery from some of the Stansted sites is shown in Figures 2 and 3. Three radiocarbon dates from organic residues on pottery from a roundhouse at Hunts Hill Farm in Upminster show that Darmsden–Linton was still current in the fourth century BC (Cotton *et al*. 2011, 44; Bayliss *et al*. 2011, 122–3). Another significant group of Darmsden–Linton material from Essex came from North Shoebury. Most of it is shell-tempered; two such sherds are decorated with a red haematite-style finish. Three coarse ware jars have a radiocarbon date of cal. 390 BC–AD 20, and presumably lie at the very start of the date range (Brown 1995c, 83–7). Clay-lined pits at early IA North Shoebury might have been used for firing pottery. Associated fired-clay cylinders were proposed as the turn-tables or *tournettes* used by the potters (Wymer and Brown 1995, 22; Barford 1995, 125). A particularly interesting group of Darmsden–Linton pottery came from Slough House Farm, where at least eight fine ware or decorated pots had been selected for deposition in a pit. Some sherds had a haematite-style slip; others were decorated with impressed circlets with white inlay (Wallis 1998a, 17 for the pit; Brown 1998, 132, 134–6 nos 41–7 for the pottery). Another site with Darmsden–Linton pottery is Little Oakley (Barford 2002, 116–26).

The growing number of Essex sites with Darmsden–Linton pottery fits oddly with the distribution map and assessment published by Cunliffe (2005, 98, 102), which show a spread of sites from the Wash to the middle Thames but with hardly any in Essex. None has subsequently been reported from Norfolk (Percival 1999, 176–7), and M.J. Brudenell (University of York) tells me that his examination of the assemblages listed by Cunliffe shows the attribution to be unsound. At least north of the Thames, Darmsden–Linton centres on Essex with only occasional finds in south-east Cambridgeshire and the south of Suffolk, such as Barham (Martin 1993, 38).

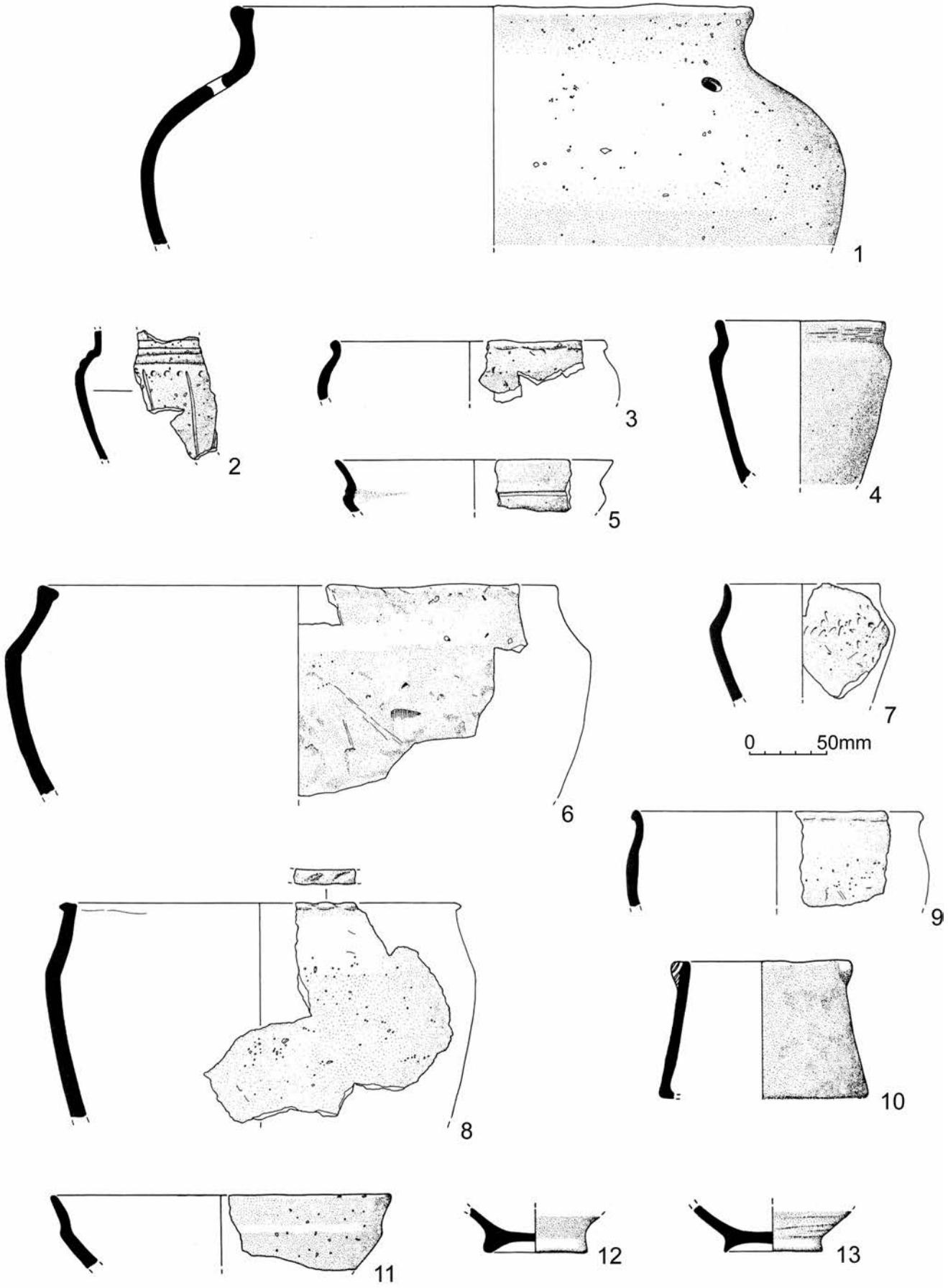


FIGURE 2: Selected Darmsden–Linton pottery from sites at Stansted airport *c*. 600–350 BC (after Brown 2004).

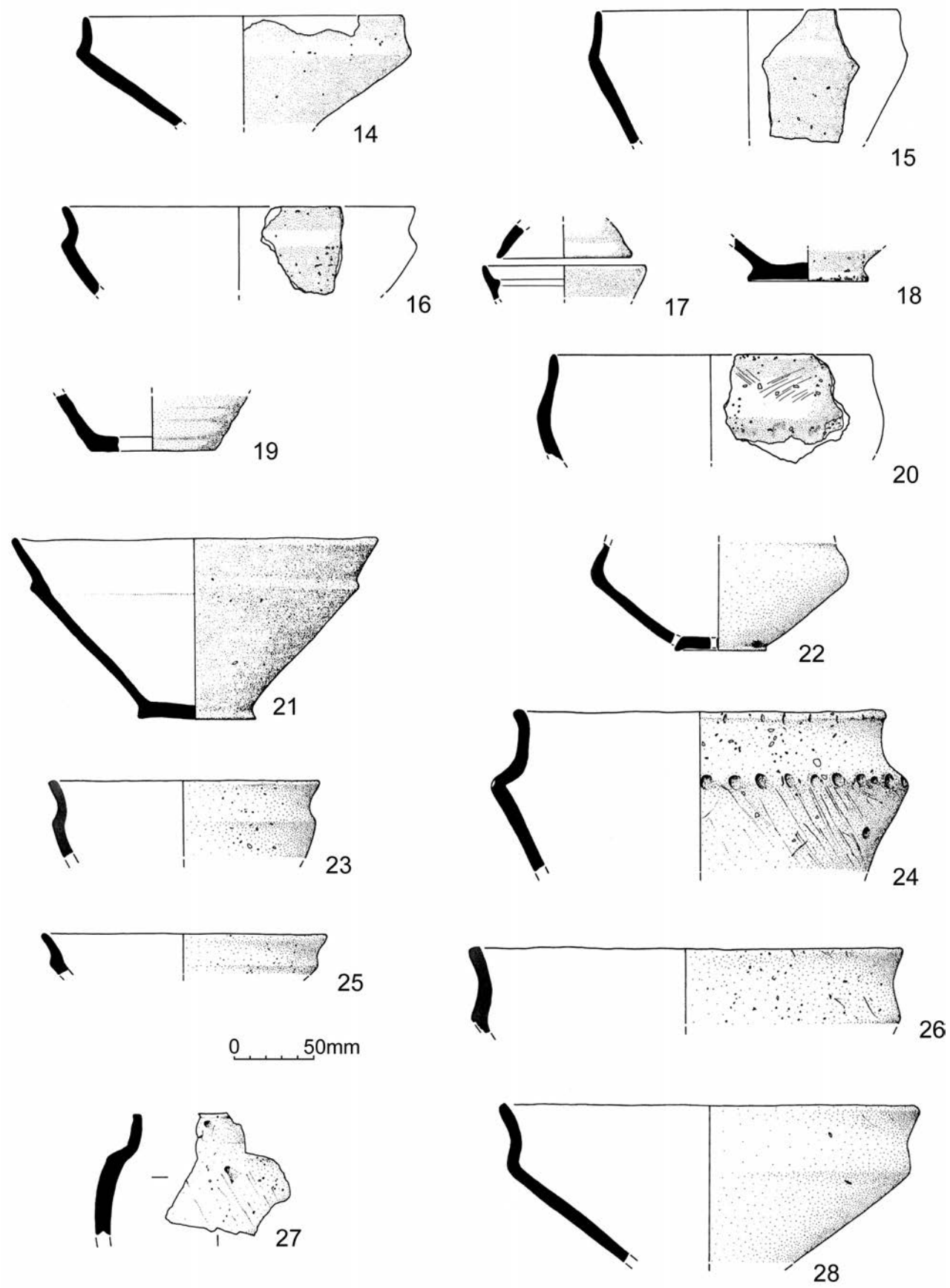


FIGURE 3: Selected Darmsden–Linton pottery from sites at Stansted airport *c*. 600–350 BC (after Brown 2004).

Conventional wisdom places great emphasis on the pedestal base in Darmsden–Linton pottery assemblages as an indicator of continental contact, to the exclusion of other typological features (Sealey 2007b, 55 with refs). In Kent, pottery that overlaps in date with Darmsden–Linton has particularly close links with wares from France (Champion

2007a, 99; 2007b, 296–7 with refs), and the investigation of typological links between Essex Darmsden–Linton wares and pottery or metalwork on the mainland of Europe might prove a fruitful line of enquiry. One notes (for instance) that a Little Oakley pot (Barford 2002, fig.92 no.33) bears a striking resemblance to vessels in the Morel Collection from Champagne (Stead and Rigby 1999, fig.13 nos 2692, 2774 & 2777), and that the rilling at the junction of the neck and shoulder on the *c*. 600 BC bronze situla from Oss in the Netherlands (Fontijn and Fokkens 2007, 366, 368) closely resembles the grooves on Darmsden–Linton carinated bowls.

Middle Iron Age Pottery *c*. 350–50 BC

There is a pottery assemblage transitional between Darmsden–Linton and MIA ware from the SCS site at Stansted (Brown 2004, 41–2, fig.31 nos 15–18). Greenwood (1997, 156–7) describes a small selection of such transitional pottery from Hornchurch and North Ockendon. Another transitional group comes from Ivy Chimneys at Witham, although the report describes it as MIA (Turner-Walker and Wallace 1999, 124–7). Early features that hark back to Darmsden–Linton include the high-shouldered and carinated situlate jars with steep straight sides, and the two pots with horizontal rilling on the shoulder (*ibid*., fig.85 nos 2, 3, 8 & 10). The largest assemblage of developed MIA pottery published since 1993 is the 51kg from the St Osyth village (Lavender 2007, 74–7), a site abandoned before the end of the period. A smaller group of 17kg from Stanway articulates with LIA pottery there and includes later MIA pottery than St Osyth (Sealey 2007b). Other interesting groups include those from Slough House Farm and Howell's Farm near Heybridge (Brown 1998, fig.97 nos 51–7, 136, 139, fig.101 nos 6–12), and Langford Road in Heybridge itself (Brown 1997 fig. 14 nos 8–12), as well as the Abbotstone and Garrison sites in Colchester (Sealey 2004b, 18–23, 25–30, fig.17 nos 8–31; Sealey 2004c, 33, 40–2, figs 38–40 nos 8–34) and Uphall Camp (Greenwood 2001, 214). Two small assemblages of MIA pottery from North Shoebury and Elms Farm at Heybridge included stamped and decorated ware in the Mucking–Crayford style found along the Thames estuary (Brown 1995c, 87–8; 2001, 64, fig.17 nos 57–63), and there is a fine Mucking–Crayford decorated bowl from Orsett (Cheer 1998, fig.59 no.9, 92). Two more such sherds from Uphall Camp have been published by Greenwood (2001, 215).

At North Shoebury the MIA pottery included vessels tempered with chalk. These apparently came from further afield, from north central Essex, the Grays region in the south of the county or even perhaps north Kent (Brown 1995c, 88). There is indeed every reason to think that much more IA pottery – of whatever date – than we have hitherto thought was traded some distance in Essex and East Anglia (Sealey 2007b, 59).

Excavations at Old Hall in Boreham parish uncovered a ring-ditch with three early La Tène brooches (Sealey unpublished; Germany in preparation). Associated pottery is MIA and allows one adjust the start of this ceramic style back from *c*. 300 BC (Sealey 2007b, 55) to – let us say – *c*. 350 BC.

Late Iron Age Pottery *c*. 50 BC–AD 43

The start date of LIA wheel-thrown grog-tempered pottery of Aylesford–Swarling or Belgic type has been explored by Sealey (2007a, 27–31), who argued that it is present in cremation graves in Essex from *c*. 75 BC but that it did not displace MIA pottery in settlement contexts until *c*. 50–25 BC. There are still very few assemblages that document the transition from MIA to LIA pottery in Essex, but pottery from two roundhouses at the ACS village at Stansted airport is some help (Going 2004, figs 100 & 109 nos 64–71 & 223–8, 159, 162). Material of first-century AD date is much more common. Important groups include those from Buildings Farm at Great Dunmow (Wallace 1997, 66–7, 71–3) and Slough House Farm at Heybridge (Horsley and Wallace 1998, 142–4). Interesting groups of pottery of LIA type of conquest period date have been published from the Stanway funerary enclosures (Benfield 2007) and the ACS village at Stansted (Going 2004, figs 97–9 nos 24–60, 158–9). The grog in LIA pottery is assumed to have come from broken pottery. A find from Buildings Farm at Great Dunmow raised the possibility that it had instead been specially prepared, although the suggestion has not been endorsed by pottery specialists (Wallace 1997, 80 *pace* Freestone and Humphrey 1997).

Late Iron Age Spouted Strainer Bowls

An interesting minor component of the LIA ceramic repertoire is the spouted strainer bowl. They are copies of more elaborate copper-alloy versions. For once, we can say something specific about the function of a prehistoric vessel type. Spouted strainer bowls have traditionally been interpreted as wine strainers, but there are no prototypes in the Roman world and associations with wine amphoras are rare. In his discussion of a suite of four ceramic strainers and a pottery cauldron from a pit dated *c*. AD 45 at Ardleigh, Sealey (1999, 119–24) suggested these vessels were used for flavouring a native drink – such as ale or mead – with vegetable additives. A connection with local drinks was subsequently confirmed by correspondence analysis (Pitts 2005, 155–6).

The first direct evidence of function came from the copper-alloy strainer bowl in the *c*. AD 40–50 doctor's grave at Stanway (Crummy 2007a, 323–6). Analysis of residues inside the spout showed the vessels had been used for a medicinal drink prepared from artemisia (mugwort or wormwood) (Wiltshire 2007). There was no pollen from grapes to indicate wine, and not enough cereal pollen to suggest ale. But whether or nor this was the case with all spouted strainer bowls remains to be seen (Crummy 2007a, 326).

A Note on South Essex Shell-tempered Ware

In the early IA, shell-tempered wares became common in south Essex (Brown 1995b, 30). At North Shoebury there is recognisably Darmsden–Linton material in shell-tempered ware (*e.g*. Brown 1995c, fig.65 nos 81–2 & fig.66 nos 105–7) but in the MIA, south Essex shell-tempered ware develops a range of forms not reproduced elsewhere in the county. Very little of this MIA and later pottery has been published from sites in south Essex since the Writtle conference in 1993. A rare exception is the five vessels illustrated from Ship Lane at Aveley of LIA to EROM date. There shell-tempered ware made up 31% by weight of those assemblages, and grog-tempered ware 35% (Martin 2002, 140–1, 143). An interesting insight into shell-tempered ware came from Orsett, where it emerged that the distinctive ledge-rim only developed in the mid-first century AD (Cheer 1988, 93).

Fifteen years ago there was little sign of exports of south Essex shell-tempered ware to the north of the county. It is seldom found in MIA assemblages (Lavender 2007, 74). A rare exception is Grange Lane at Little Dunmow, where it is present in 'very small quantities' (Avery 2007, 219). But several assemblages of LIA pottery are now known from the north of the county in which shell-tempered pottery is present in sufficient quantity for one to think in terms of a regular trade in the ware. Site 50 at Little Dunmow Road is one of them, where it was 6% of the pottery by estimated vessel equivalent (Powell 2007, 70–71; Powell and Biddulph 2007, fig.2.40 nos 6 & 10; Biddulph 2007c, 225). At Grenville Road in Braintree, 33% by weight of a late first-century BC group of pottery was shell-tempered (Martin 2000, 104). We know that these finds of shell-tempered ware came from south Essex because of their typology. There is no sign in IA Essex of shell-tempered ware from the south-east Midlands and Fens (Wallace and Horsley 2004, 310).

DOMESTIC ARCHITECTURE AND POPULATION LEVELS

Roundhouse Archaeology

Domestic buildings in the IA of Essex were – with a very few exceptions – roundhouses, and many house plans have been uncovered since 1993. Until the middle of the first millennium BC, the major surviving components of roundhouse walls are circular settings of posts set in the ground at regular intervals (Brown 1999, 177). A small house from Great Holts Farm at Boreham shows this tradition in the early IA. Post-holes there defined a sub-circular structure with a diameter of some 8m; associated pottery was Darmsden–Linton (Germany 2003, 14, 216; Brown 2003, 93–4). By the MIA such an arrangement was generally replaced by a penannular gully in which the wall posts were set, with an outer and concentric eaves-drip gully to take rain water from the roof. It is most unusual for both such gullies to have survived, but one such instance was reported from Site 38 at Takeley (Powell 2007, 70–2; Powell and Biddulph 2007, 74–5). Another interesting house is a middle Iron Age structure from Hyderabad Barracks at Colchester (Crummy 2011) (Figure 4). Just inside the eaves-drip gully can be seen a line of stake holes for the wall. Rather more difficult to interpret are the concentric rings of post-holes in the centre of the house. They are set so close together that access to the centre of the house would not have been possible. One explanation is that the line of posts was roof supports that included replacements in a different position such that not all the posts stood at anyone time. Internal posts in houses may have included timbers for items of furniture set in the ground (Harding 2009, 212), in which case we might even be dealing with a central round table here.

Most penannular eaves-drip gullies are less than 12m in diameter. Larger ones are very rare, and may indicate

FIGURE 4: The middle Iron Age roundhouse from Hyderabad Barracks at Colchester. Copyright: Colchester Archaeological Trust

richer households (Evans and Hodder 2006, 278). A few such great houses have been found in Essex. One from Howell's Farm at Heybridge had an eaves-drip gully with a diameter of 14m (Wallis 1998b, 111–12, 114–16). On the CIS Site at Stansted Airport there was one of MIA date 15m in diameter. Its exceptional status found further expression in the deep foundations for a watch tower at one corner of its rectilinear enclosure (Havis and Brooks 2004a, 24–5; 2004b, 521). An LIA to EROM roundhouse at Orsett was even bigger, with a diameter of 15.5m (Carter 1998, 23–4). But the biggest of all is an oval MIA house with a maximum diameter of 16.3m from Uphall Camp, where the associated finds may support the case for elite status (Greenwood 2001, 211). Even in the case of a typical roundhouse, significant quantities of materials were required for its construction (Reynolds 1982, 190; 1993, 99–100; Darrah 2006). With impressive houses of the kind described here, the materials needed were greater still because any increase in house diameter involved an exponential increase in the weight of the roof (with all that implies for the quantity of reed thatch required) (Carter 1998, 120–1), and this lends weight to the view that these great houses may indeed have been for people of some consequence.

Unravelling the precise details of the superstructures of IA roundhouses is challenging. Carter (1998, 111–13, 120–8, 157–62) offers an extended and imaginative discussion of the problems. A few specific observations can be made. To judge by post-pipes at Orsett and St Osyth, timber in the round as well as was squared timber was used (*op. cit*., 111; Germany 2007, 53). One of the structural timbers at St Osyth was oak (Gale 2007, 89–90). The use of iron nails in the superstructures is suspected. Nails have been reported from LIA and EROM cremations at Stansted airport in circumstances where there is no reason to think they held the pyre timbers together and where they presumably represent nails from recycled structural timbers taken from derelict houses (Gale 1997, 78; Fitzpatrick 1997, 106; Cooke 2008, 99).

Evidence for the maintenance of roundhouses can take several forms. At St Osyth, the application of a secondary coat of daub some 15mm thick – but without wattles – looks like a repair (Major 2007, 81). One of the houses there had its doorway rebuilt three times (Germany 2007, 53). At the Stansted airport ACS village, another roundhouse may have been patched up after the cutting of a fresh length of wall-foundation trench (Havis and Brooks 2004a, 92). But eventually houses beyond repair were replaced, sometimes in much the same position as their predecessors, such that the excavated plans partially overlap, as at Buildings Farm outside Great Dunmow (Lavender 1997, 50–2), several of the houses at St Osyth (Germany 2007, figs 33 & 36, 54) and Roundhouse C at Slough House Farm at Heybridge (Wallis 1998a, 21, fig.17). Despite the number of roundhouses excavated in Essex, very few had structural timbers that had been left to rot in their post-holes: the decaying posts were presumably removed and used for firewood. The replacement of houses in much the same position is quite different from the practice in the BA when many settlements in southern Britain only had a single phase of occupation (Brück 1999).

This leads to the question of how long a roundhouse could remain habitable before serious structural decay made it unsafe. It is worth giving thought to the topic because the answer might help gauge how long settlements like St Osyth – where houses had been rebuilt in the same position – may have been occupied. Brück (1999, 149 following Wainwright and Longworth 1971, 224–5) suggests that in favourable circumstances oak heartwood posts set in the ground could have a life of about fifteen years for every 50mm of post diameter. At Little Waltham, timbers from roundhouses fell in the 200–350mm range (Drury 1978, 120), which suggests a possible life of 60 to 105 years. Traditional estimates of IA roundhouse life at 25–50 years might well be on the conservative side (Evans and Hodder 2006, 268; Drury 1978, 126).

Rectangular Houses

Not all IA houses in Essex were round: two rectangular domestic structures have been published since 1993. In the ACS village at Stansted airport a six or eight-post house measuring at least 6 by 4m was one of the earliest structures on the site; it was replaced by a roundhouse in the same position (Havis and Brooks 2004a, 79–8, fig.57, pl.5). Close-Brooks has argued convincingly that the site plans for the *c*. 250–100 BC village at Little Waltham show another post-built rectangular structure 7.5 by 8m across (Close-Brooks 1993, 336–7 adjusting Drury 1978, 24–6). Site 50 on the A120 had a truncated L-shaped MIA gully 7.7 metres long which might have been a building, but the dearth of finds (only three sherds of pottery) suggested it was a barn or even a shrine rather than a house (Powell 2007, fig.2.26, 59–60). Another small post-built rectangular house at Howell's Farm near Heybridge measured 7 by 5.5m. It was dated early first century AD (Wallis 1998b, 116, fig.89). M. Atkinson tells me that more rectangular structures of LIA date were excavated at another Heybridge site, Elms Farm.

The Rationale behind Settlement Enclosure in the Iron Age

Most of the IA roundhouses in Essex were on settlements demarcated by an enclosure ditch (Figure 5). Twenty years ago there was a tendency to think of these enclosures as defensive and to interpret them primarily in terms of actual or potential warfare. That view is no longer held, and the reasons are not far to seek. Sites that look defended can be deceptive, such as the MIA farmstead at Ypres Road in Colchester. The ditch at the entrance way was deep and impressive, but at the rear of the settlement it was little more than a gully. Emphasis on an impressive ditch at the entrance suggests the reasons for enclosure were more to do with ostentation than defence (Crossan and Masefield 2004, 20–1; Brooks and Masefield 2005, 8–9). Likewise at Stanway, the ditch around a MIA farmstead was allowed to silt up soon after its creation. No attempt was made to recut it or keep it free of accumulations of soil wash, and so it is difficult to see why it was needed in the first place and a defensive role seems implausible (Sealey 2007b, 51–2). It is now felt that settlement boundaries had an ideological basis that cannot be explained entirely in utilitarian or more prosaically functional terms.

The boundary of archaic Rome called the *pomerium* illustrates the web of ritual and protocol that could be invested in boundaries. Originally defined by a plough furrow, the *pomerium* defined spheres of activity and prescribed conduct: human burials could not take place within it; foreign kings and queens were not allowed within its confines, it was forbidden to carry weapons inside, and more besides (Ogilvie

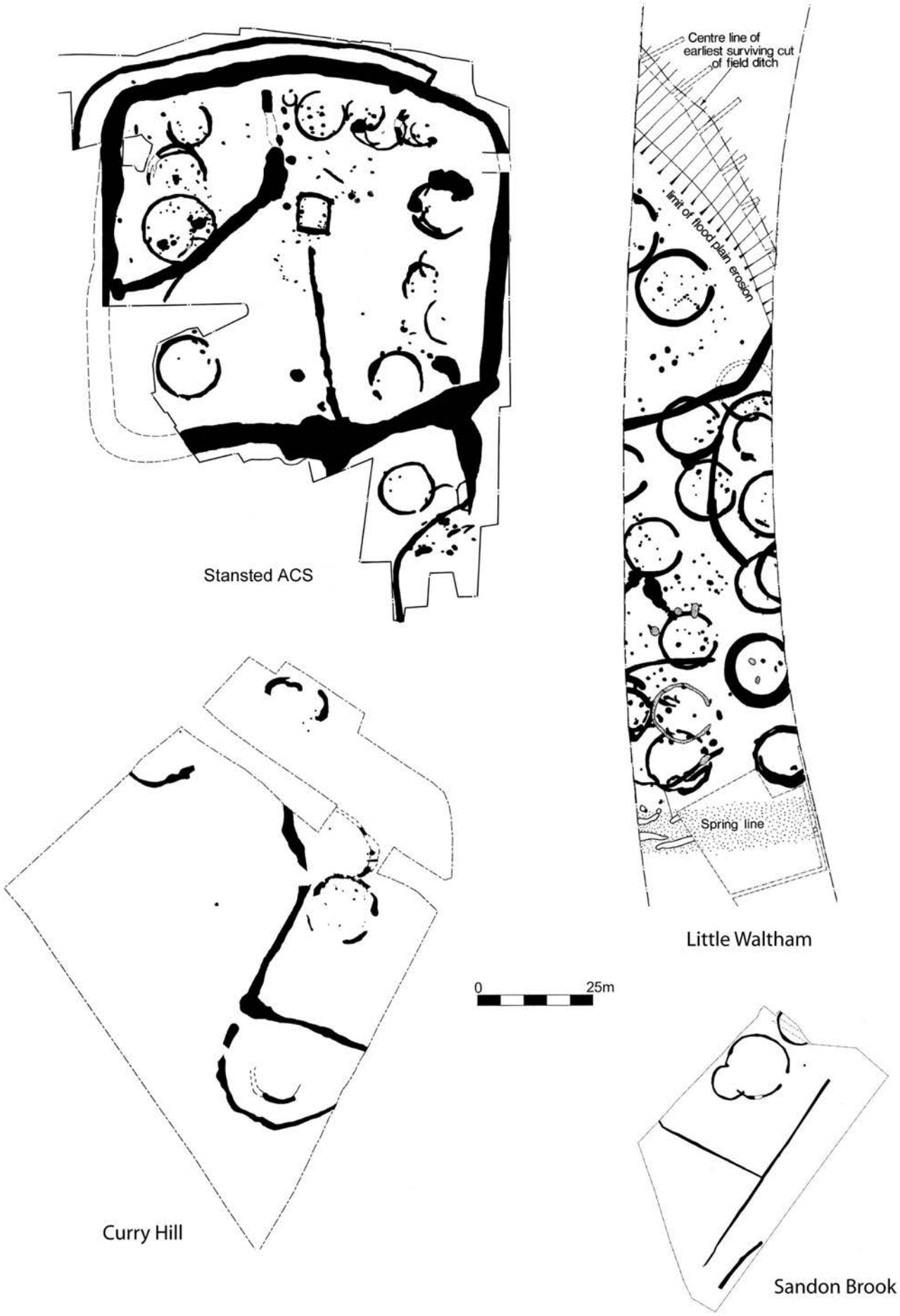


FIGURE 5: Plans of selected Iron Age settlements

1970, 179–80; Cornell 1995, 503). Boundaries in IA Britain might have been the focus of equally elaborate codes of ritual and etiquette.

Nevertheless, we should not overlook the defensive role of some settlement enclosures. A case in point is the ACS village at Stansted airport which was defined by a deep and flat-bottomed ditch big enough to have been a protection against hostile intent (Havis and Brooks 2004a, 80, fig.58; Cooke 2008, 108). One of the sections shows a steep outer slope, with a gentler inner one; coupled with the broad flat base of the ditch, one has a fortification – but on a smaller scale – reminiscent of the Fécamp style of hill-fort defences identified in northern France and found in a few forts in southern Britain (Wheeler and Richardson 1957, 11; Cunliffe 2005, 357, 364, 402).

The Case for Population Decline in the Late Iron Age

Tables 2–3 have the numbers and dates of IA roundhouses from excavations along the lines of the A120 and A130 highways, as well as Stansted airport. Those excavations have been singled out for study because they tackled whole swathes of countryside, and are likely therefore to give more representative results of roundhouse incidence than excavations which concentrated on a single site.

In evaluating the data in Table 3, it is important to remember that nine of the twelve MIA to LIA houses came from the ACS village at Stansted airport which was abandoned in the first century by *c*. 25 BC (Havis and Brooks 2004a, 79). It is striking that roundhouses tend to be MIA. Very few of the houses in Tables 2–3 are later. One used to think this could be explained by the replacement of roundhouses in the LIA with rectangular structures resting on sleeper beams which seldom leave any archaeological trace (Sealey 1996, 60). It is difficult to endorse that now because precious little in the way of rectangular houses of IA date has come to light since then, and those that have turned up were often post-built (see above).

On the contrary, the survival of the roundhouse architectural tradition through the LIA is evident from the erection of such buildings in the EROM period in the region. Several were built in EROM London (Sheldon 1974, 15–16; Roskams 1991, 3, 5–8; Perring 1991, 101, 106). They also feature in Essex after AD 43, in the LTCP eastern settlement at Stansted airport (Cooke 2008, 97–8, 100–1) and elsewhere (Carter 1998, 33–5, 36; Biddulph 2007b, 110).

Even allowing for the LIA introduction of rectangular houses that can leave little trace in the archaeological record, the decline in the number of roundhouses between the MIA and the LIA in Tables 2–3 shows there was a significant decline in the population of IA Essex towards the end of the period.

CASE STUDIES IN SETTLEMENT ARCHAEOLOGY

A Middle Iron Age Nucleated Settlement at St Osyth

St Osyth is the most extensively excavated MIA settlement of recent years (Germany 2007, 43–58, 115–17). What were apparently the earliest roundhouses on the site (Figure 6) were the three erected in the south-east corner of the excavated area over a field system of narrow strip-fields. Subsequently a wide trackway that ran east-west was constructed. At the east end it had a funnel entrance with a narrow droveway that led south. An easterly extension of this droveway ditch was cut through the site of two of these three earliest houses. Some twenty metres to the north was the St Osyth village proper of nine roundhouses in a ditched enclosure. The ditch was only 88cm deep at its deepest point, and often much shallower; some sections had been recut. Between the

Site	Period	Number of houses
Stansted airport LTCP western end	MIA	5
Stansted airport LTCP western end	MIA to LIA	1
Stansted airport LTCP eastern settlement	LIA	1
Stansted airport LTCP eastern settlement	LIA to EROM	4
Stansted airport NP	MIA	2
Stansted airport MTCP	MIA to LIA	1
Stansted airport M11	MIA to LIA	1
Stansted airport M11	LIA to EROM	1
Stansted airport ACS	MIA to LIA	9
Stansted airport CIS	MIA	1
Stansted airport LBS	MIA	1
A120 Highwood Farm	MIA	3
A120 Highwood Farm	IA	1
A120 Grange Lane	MIA	2
A120 East of Parsonage Lane	MIA	1
A120 East of Little Dunmow Lane	MIA	4
A120 East of Little Dunmow Lane	LIA	2
A130 Sandon Brook	early IA to MIA	3
A130 Curry Hill North	early IA	1
A130 Curry Hill Central	early IA to MIA	5

(after Havis and Brooks 2004a, Cooke 2008, and Dale et al. 2007)

TABLE 2: Numbers of dateable Iron Age roundhouses from selected excavations in Essex

Period	Number of roundhouses	Percentage of total
IA	1	2
early IA	1	2
early IA to MIA	8	16
MIA	19	38
MIA to LIA	12	24
LIA	3	6
LIA to EROM	5	10
Total	49	

(percentages are rounded to the nearest whole number)

TABLE 3: Incidence by period of the roundhouses in Table 2

enclosure ditch and a northern continuation of the trackway ditch were a further four roundhouses. In the south-east corner of the site, three more roundhouses were built. Two of them were sited in rectangular compounds. There were not enough stratigraphical relationships to link all nineteen of the roundhouses at St Osyth into a unified scheme of settlement development, but the greatest number of houses standing at any one time might have fourteen.

The Late Iron Age Village at Heybridge

Elms Farm

Heybridge is a village on the north bank of the river Blackwater opposite the town of Maldon, where the rivers Chelmer and Blackwater enter the North Sea through the Blackwater estuary. Excavations and chance discoveries since the nineteenth century west of the modern village indicate an extensive Roman settlement preceded by major IA activity on the flood plain (Wickenden 1987). In 1993–95 a major campaign of excavations shed new light on the settlement (Atkinson and Preston 1998).

Occupation at LIA Heybridge began in the middle of the first century BC. An undefended settlement extended over some 20ha, although the density of housing was generally low. Individual properties were set in small ditched compounds; most were roundhouses, but some rectilinear structures were also identified. These houses were bounded by a trackway, beyond which lay a landscape of long narrow fields. A conspicuous feature of the village was a small temple complex consisting of a rectangular ditched shrine with a central pit and an adjacent roundhouse; a miniature pot had been buried inside the house. Both structures were located on a low natural gravel eminence. Iron-working and the production of copper-alloy artefacts took place in the village. The IA coin list includes twelve potins and a wealth of bronze issues: there were five of Tasciovanus, four of Dubnovellaunos and eighty-three of Cunobelin. In the middle of the first century AD extensive remodelling of the site effectively removed all but the deepest IA features and made it difficult to reconstruct the morphology of the first settlement in detail. Extensive areas of top soil were removed down to the natural gravel. A rectangular street grid of gravelled roads was laid out on beds of sand; land between these streets was treated with spreads of coarser gravel, sometimes incorporating amphora sherds and animal bone. The IA shrine was replaced by a more ambitious temple precinct. These changes took place over a short period of time and bear every appearance of a major project directed by some central authority, although it is difficult to know if it took place on the eve of the Roman invasion or shortly afterwards.

South Weald Camp and Uphall Camp

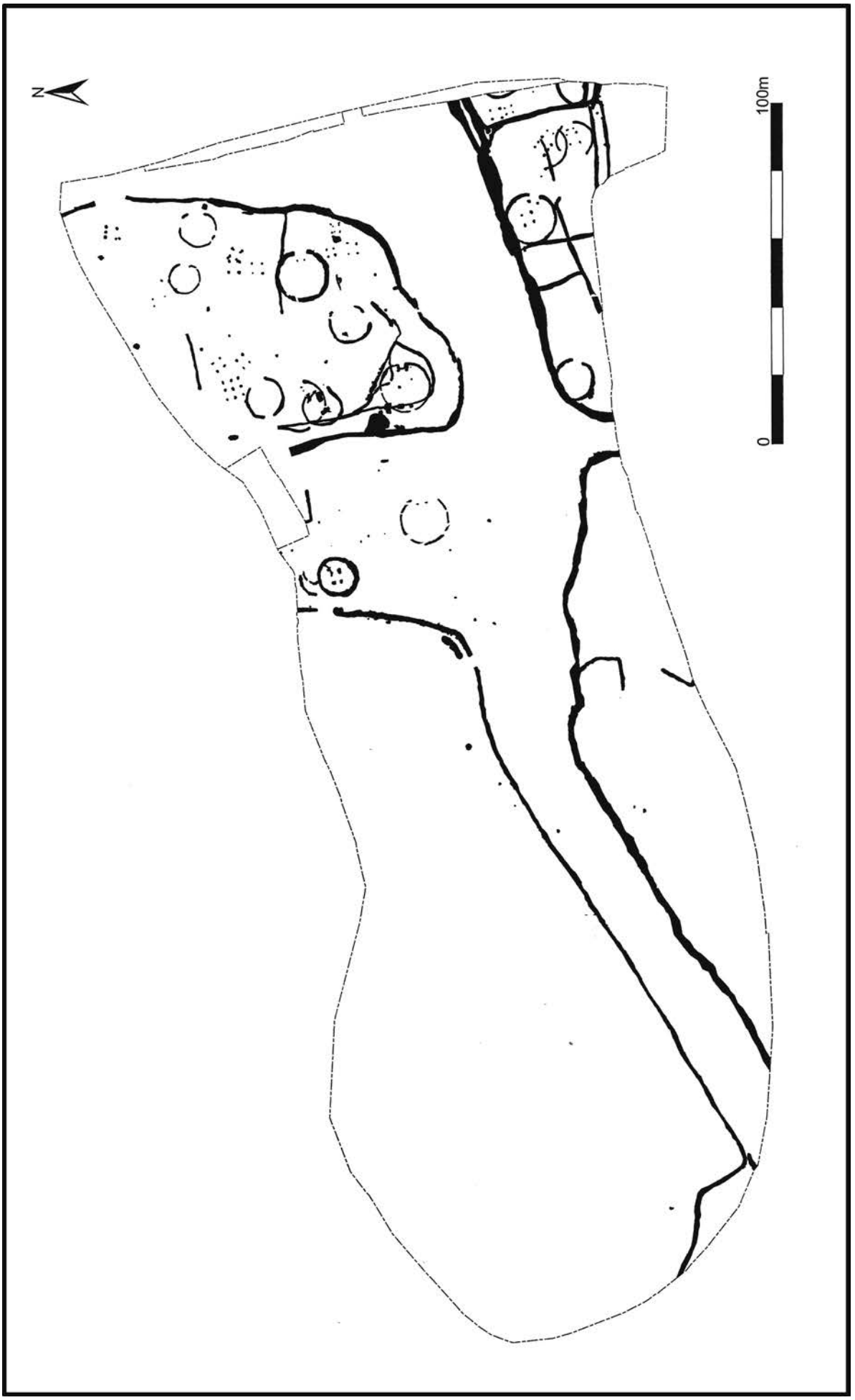
Coverage of Essex IA settlements would be incomplete without reference to South Weald Camp, a univallate hill-fort at Brentford that enclosed some 2.8ha. Excavation established a single phase of construction in the LIA. Finds included a Dressel 1 amphora rim (Isserlin 1995; Medlycott *et al*. 1995). We now also have a new interim report on Uphall Camp in Ilford (Greenwood 2001). Uphall Camp brings to mind four other sites with Iron Age activity in what was once west Essex, but is now the London borough of Havering: Great Sunnings Farm, Hunts Hill Farm, Manor Farm and Moor Hall Farm. A summary account of what was excavated is now available (Howell *et al*. 2011).

TRADE WITH THE ROMAN WORLD

The Wine Trade with Prehistoric Essex

Wine was the most important element in trade between Britain and the Roman world. Most arrived in Dressel 1 amphoras from Italy, a form that had a long life until *c*. 10 BC. Sites in Essex that have produced examples since the compilation of earlier gazetteers are listed by Wallace (1995). All the discoveries of recent years have been from settlement sites, with none from graves. A dramatic settlement find was the neckless Dressel 1 that had been placed horizontally in its context at Hunts Hill Farm in Upminster (Greenwood *et al*. 2006, 15). Forty-four more were retrieved from the Elms Farm excavations at Heybridge (Sealey 2009, 15–19), and the writer has seen another eleven from the 2007–8 excavations at the Sheepen site in Colchester. Essex has more of these early amphoras than any other English county.

The start of the wine trade goes back to *c*. 100 BC, to judge by the typology of some of the Dressel 1 amphoras from the ACS village at Stansted because they include a variant known as Dressel 1G. Its presence there obliges us to adjust the start date of occupation from *c*. 75 BC (Havis and Brooks 2004a, 79) back towards *c*. 100 BC (Sealey 2009, 6 n.23). The ACS villagers drank their wine with some style, to judge by a local copy in copper-alloy of the handle of a Roman silver drinking cup (Major 2004d, 132 no.26). That bronze smiths in Essex were making their own versions of Roman cups is of some interest because the number of wine cups shown on IA



FFIGURE. 6: The middle Iron Age Settlement at St Osyth

FIGURE 7: The late first-century BC imported Roman glass bowl from the *c*. 40–50 AD warrior burial at Stanway. Copyright: Colchester Archaeological Trust

coins suggests these copies and their imported prototypes were more common than the number of surviving examples might suggest (Williams 2005a, 26, 29, 32–3).

Study of the wine amphoras from Stanway and the Elms Farm site at Heybridge showed that wine imports in Dressel 1 peaked at the very end of the form *c*. 10 BC. Afterwards, the volume declined by between two-thirds and three-quarters as wine that had hitherto been exported from Italy was consumed there instead (Sealey 2009). Before we leave the topic of wine, it only remains to be said that there is no persuasive evidence in Essex for the ritual decapitation of Dressel 1 amphoras that we find in Gaul (*pace* Ralph 2007, 310).

Some Other Roman Imports

Amongst the pottery from the 1993–95 excavations at Heybridge Elms Farm, Dr P.A. Tyers identified a Mediterranean beaker of form Vegas 1b, decorated with thorn-like mouldings (Greene 1979, 4–5). The type is first century BC, and ends under Augustus. It has not been reported elsewhere in Britain.

The most striking Roman import in IA Essex is a glass bowl from the *c*. AD 40–50 warrior burial at Stanway (Figure 7). It must have been a precious antique at the funeral because it had been made in the last decades BC. Vessels like it are shown in late first-century BC wall paintings at Pompeii, but until the excavation of the Stanway specimen it had been thought those bowls might only have been products of the imaginations of the painters. The Stanway bowl refuted that: it is a document of major importance for glass studies, as well as one of the earliest known blown vessels (Cool 2007, 340–3).

DECORATED METALWORK

One of the glories of the La Tène metalwork of IA Britain is the decorated copper-alloy mirror series. Since 1993 two examples have been published from Essex. They were found at Hyderabad Barracks in Colchester and at Rickling (Jope 2000, 289; Sealey 2006). Production came to an end in Essex and elsewhere in the south-east by the start of the first century AD, but the reasons for this are unfathomable. Mirror-style art was not confined to mirrors. It is present on a pair of copper-alloy shears from Hamperden End (Figure 8). They are unique: the only other pair from IA Britain was found at Flag Fen (Peterborough), but that set is undecorated (Anonymous 2004; Hill and Crummy 2005; Megaw and Megaw 2005, 46–7). Links between mirrors and other examples of LIA art are further exemplified by the tankard handle in the *c*. 75–25 BC warrior burial from Kelvedon (Sealey 2007a, 12–13).

As data accumulates, anomalies in the archaeological record can rear their head. A case in point is the distribution

County	Terret	Linch-pin	Strap-union	Bridle-piece	Mount	Totals
Norfolk	40	5	3	3	6	57
Suffolk	28	3	1	1	4	37
Cambridgeshire	2				1	3
Essex	4		1			5
Totals	74	8	5	4	11	102

(after Worrell 2007)

TABLE 4. Horse and vehicle fittings recorded by the Portable Antiquities Scheme between September 1997 and October 2004

FIGURE 8: The late Iron Age copper-alloy shears from Hamperden End. Copyright: Network Archaeology

of horse gear and vehicle fittings in Essex and East Anglia and neighbouring counties (Table 4). The discrepancy between Essex (where they are rare) and East Anglia (where they are common) is remarkable, particularly as some of the 4,000 chariots Cassivellaunus brought to bear against Caesar (*De Bello Gallico* 5.19) must have hailed from the London region and parts of west Essex. It is difficult to know how to account for this (Worrell 2007, 376–80; Garrow 2008, 25–6).

WARFARE

A warrior burial from Kelvedon dated *c*. 75–25 BC (Sealey 2007a) has shed much light on prehistoric warfare in Essex. The Kelvedon warrior was armed with a sword, shield and spear (Figure 9). Some of his weaponry had come from an armourer overseas: the possibility that the warrior had travelled would have made him a member of what Wells (2007, 472) called the 'international warrior elite'. Individuals equipped with a sword, shield and spear represented a style of fighting that developed on the mainland of Europe in the third century BC but which was not adopted in Britain until much later, in the first century BC. Six other swords from IA Essex are described in the Stead (2006) corpus. Kelvedon represents the elite side of IA warfare. Most warriors had to make do with one or more spears, like those in the first-century AD hoard of six from Orsett buried on the eve of the Roman invasion (Major 1998, 83–5).

At a humbler level, the sling was apparently in use. Fired-clay sling shot continues to be reported from Essex (Major 2007, 79–80). An LIA example from Great Sunnings Farm at Upminster is illustrated with a colour plate (Greenwood *et al*. 2006, 35). Presumably fired-clay sling shot was used for herding or hunting (they would not damage the pelt or hide), rather than for warfare (Cunliffe 1987, 165). A small hoard was found just across the Essex border, at Sudbury in Suffolk (Martin *et al*. 1990, 162). One hopes that a hoard of *stone* sling shot will eventually turn up in Essex to show that they played a part in warfare as well.

DEATH AND BURIAL

For most of the IA in Britain the dead were disposed of in ways that left no perceptible archaeological trace. Only towards the end of the period do funerary rites become a significant part of the archaeological record in Essex.

Early and Middle Iron Age Burials

On the Colchester garrison site, a cremation in Pit F276 was accompanied by sherds of Darmsden–Linton pottery placed vertically (on edge) in the pit base (Sealey 2004c, 40, fig.38 nos 4–7; Brooks and Masefield 2005, 20). We have already mentioned the suite of three fourth-century BC brooches from a circular ring-ditch at Old Hall in Boreham parish. Mark Germany tells me that there were five other MIA ring-ditches in the immediate vicinity; four were circular, and one square. Aggressive soil conditions meant that bone had not survived, and two iron penannular brooches were the only possible grave goods. The Boreham cemetery is an exceptional site because IA inhumations in round barrows are so rare in Britain (Hughes 1994, 400) .

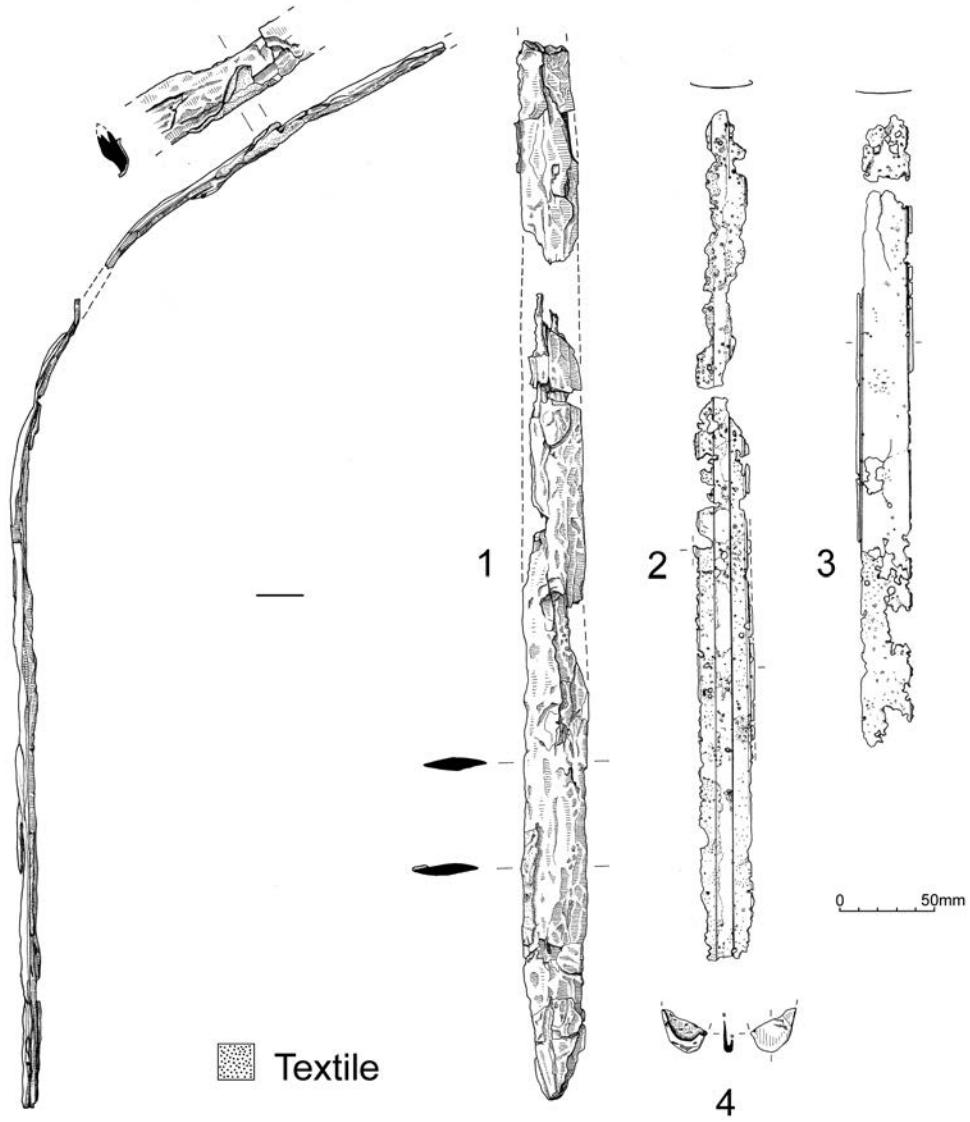


FIGURE 9: Sword and scabbard from the Kelvedon warrior burial *c*. 75–25 BC. 1, iron sword blade; 2, front plate of the copper-alloy scabbard with tin strip; 3, back plate of the copper-alloy scabbard; 4, copper-alloy scabbard chape

Late Iron Age Unurned and Unassociated Cremations, and Cenotaphs

At Stanway the cremated bones of an adult had been placed in a pit stratigraphically higher than – but not far from – a currency bar hoard in the ditch of the MIA farmstead there. The bones had not been placed in a pot and there were no grave goods; charcoal in the pit might have been pyre debris The date was apparently early in the LIA (Crummy *et al*. 2007, 26–7). Another unurned cremation of LIA date without grave goods was excavated at Takeley (Ennis 2008, 31). A small LIA to EROM cemetery on the MTCP site at Stansted airport had two features without any cremated bone at all which were interpreted as cenotaphs (Cooke 2008, 110–11). These unurned and unassociated cremations and cenotaphs are a new feature of the Essex IA. One wonders in particular how many unurned and unassociated cremations have been overlooked in the past. It is not beyond the realms of possibility that there may be actual cemeteries of such graves awaiting discovery.

Pyre Sites and Pyre Debris Pits at Heybridge Elms Farm

Although there are interim reports on IA Elms Farm with some account of the funerary rites there (Atkinson and Preston 1998, 92–4; Sealey 2009, 15), the primary source for what follows is information generously provided by the excavator, Mark Atkinson. One of the two LIA cremations at Elms Farm was a late first-century BC grave (Atkinson and Preston 1999, 28) which acted as the marker for nineteen pyres that stretched in a line northwards, aligned with a field boundary a few metres away. Two more pyre sites were found further east. Those pyre sites closest to the grave were positioned at regular intervals; pyres at the far end of the sequence of nineteen were more randomly located. It is tempting to think that the nineteen pyre sites represent a chronological sequence that started with the one closest to the cremation grave. If so, it suggests that it was important to mourners that the location of previous pyres was remembered, with the implication that former pyres were somehow venerated.

A typical pyre site was an elongated oval or oblong scoop with a tongue-like notch on the west side designed to promote the flow of air into the burning pyre. There were often signs of *in situ* burning on the floor and sides. Fills consisted of charcoal, gravel, cremated human bone, burnt broken pottery and metalwork, most commonly brooches. The human bone was scattered throughout the fill and ranged in weight up to several hundred grams. There were no indications that the fills of these pyre pits had been disturbed after the combustion of the corpse, and it would seem that a pyre site was only used once.

There were also some sixteen pits with debris that had been removed from the pyre. These pyre-debris features were smaller pits than the pyre sites, and rounded rather than oval or oblong. Fills had charcoal, cremated bone and burnt pottery; one had a brooch. As a rule, there was no sign of *in situ* burning. Not all the pyre debris was present, and the impression given was of the deliberate burial of a token sample of pyre material. Some of the pyre-related features were close to pyre sites, others were further away. The most striking pyre-related feature was Pit 15417 which produced over 58kg of imported and local pottery, much of it burnt and distorted by fire.

Elite Cremations at Stanway

Cremation rites towards the summit of the IA social pyramid are documented by the funerary enclosures at Stanway (Crummy *et al*. 2007). Here too were found the pyre sites and pyre-debris pits recognised at Heybridge, but with the addition of plank-built funerary chambers and cremations in rectangular enclosures. Conjoined rectangular funerary enclosures have also been reported from the LTCP site at Stansted airport, complete with central cremations (Cooke 2008, 95, 98–9, 124). The earliest funerary feature at Stanway was a large rectangular enclosure constructed *c*. 25 BC. A contemporary pit with debris from a pyre was found elsewhere on the site. No more activity took place at Stanway until the middle of the first century AD. At the time of the Roman invasion another rectangular funerary enclosure was laid out *c*. AD 35–45 to the east of Enclosure 1. Two more enclosures were added to the south *c*. AD 40–50. What might be styled conventional cremation graves were found on the west side of the enclosures. These had complete grave goods and cremated bone heaped in one or more piles on the floor. Some of these burials were unexceptional, but at least two were remarkable for the range and nature of their grave goods. One was a warrior and the other a doctor, quite possibly a druid – although that has been contested (Crummy 2008). Both had more or less complete amphoras and so belonged to the Welwyn-type graves defined by Stead (1967, 44).

The picture is complicated by the presence towards the centre of each enclosure of a timber-built chamber in which cremated bone, smashed pottery and other broken artefacts had been placed. Some of these smashed artefacts had been burnt, suggesting exposure to a pyre. After the deposition of this material the roof of the chamber was re-instated. The size, elaborate structure and position of each chamber in its enclosure suggest the human remains belonged to higher status individuals than those in the Welwyn-type graves alongside the chambers. But there is always much less bone in the chambers than in the other graves at Stanway, and the challenge is to decide if the chambers represent a stage in the cremation process or its culmination. Analogy with Folly Lane at Verulamium suggests the chamber was a stage in the process (Niblett 1999, 394). Crummy (2007, 433) took the same view of the Stanway chambers, even though (unlike Folly Lane) there was no adjacent grave pit.

Excavations at Stanway and Elms Farm at Heybridge have transformed our knowledge of LIA cremation practices in Essex. It has emerged that the cremation process was more protracted and elaborate than we had hitherto realised, particularly in the case of elite funerals.

COINAGE AND CURRENCY

The number of IA coins from Essex available for study has increased dramatically since 1993, largely through the more systematic recording of metal detector finds by the Portable Antiquities Scheme. One of the more important results of this new data concerns British G. Enough finds of these rare coins are now known to show that the embryonic Trinovantes occupied a restricted territory *c*. 55–25 BC running from Woodbridge in Suffolk, south towards Maldon in Essex (de Jersey and Newman 2001). Traditionally we have thought of Essex and the Trinovantes as if they were co-extensive, but that view now needs qualification. A later ruler of the Trinovantes was Dubnovellaunos, the prince who fled as a suppliant to the emperor Augustus *c*. AD 10 (*Res Gestae* 32). We now have a thorough review of his coinage by Kretz (2008). One of his more important conclusions is that he was one and the same man as the Dubnovellaunos whose coins are found in Kent (Kretz 1998). An ambitious essay by Curteis (2008) synthesises the coin data in its entirety for IA Essex.

From the end of the first century BC, dynasts in Essex and elsewhere in Britain issued coins with legends (inscriptions) (Williams 2002, 10). Many of them are set in a rectangular frame or cartouche, a practice not found on contemporary Roman or Gaulish issues. Williams (2003) argues convincingly that the practice was inspired by the cartouches of the name stamps on imported pottery that reached LIA Britain. He also integrates coin legends with the graffiti on pottery in the IA, a topic explored further in an Essex context by Sealey (2007c).

It is the coinage of the high king Cunobelinus that has attracted the most sustained attention since the 1993 conference; and rightly so, bearing in mind his long reign *c*. AD 10–39/40 as well as his stature as *Britannorum rex* (Suetonius *Gaius* 44.2). But the use of the genitive rather than the nominative case for his name on these coins led Williams (2007, 6–7) to suggest that we may have exaggerated the security of his hold on power. Indeed, two new personal names on his coinage that have come to light in recent years apparently show him prepared to acknowledge the participation of others in his authority. One name is abbreviated to AGR, and the other to DVB (de Jersey 2001, 15–16, 23, 31–2; 2002; Sills 2003b; Kretz 2008, 23–4). We now have a detailed study of the silver coinage (de Jersey 2001) to complement the forty-year-old study of his gold issues (Allen 1975). In conjunction with other research by de Jersey on the earliest phase of the gold coinage (the *biga* series), it has emerged that the earliest gold and silver coins of this formidable king are concentrated in the old Trinovantian heartlands of north-east Essex and south-east Suffolk. Evidently his unification of the Catuvellauni and Trinovantes came later in his reign, an important insight

with tantalising implications for political history (de Jersey 2000b, 3; 2001, 24, 26–8; de Jersey and Wickenden 2004, 177–8). Scientific analysis of his bronze coinage indicates two mints. One was at Colchester, but the location of the second is unknown, although Verulamium is a possibility (Clogg and Haselgrove 1995). At the end of his reign we have the famous gold coins of the *classic* series, with crisp images executed in Roman style. There is a consistent alignment of the obverse and reverse dies on the *classic* series, showing the use of hinged dies along Mediterranean lines. This interesting technical innovation hints at close contacts between Cunobelin and the Roman world (Edward and Dennis 2006, 253–5). Another technical study has shown that Cunobelin was able to strike his gold coins to a weight standard that is accurate to within at least 0.11g, an astonishing achievement (Williams 2005b, 125–6).

Coin hoards have added significantly to knowledge, and three of the most interesting should be mentioned here. A cache from Orsett is remarkable because it includes specimens of the earliest stratum of coinage found in temperate Europe, three gold copies of the Macedonian issues that served as the prototypes for much of the coinage found in Gaul. These particular coins may be as early as *c*. 300 BC, although the hoard itself did not go to ground until the mid first century BC (Sills 1999; 2003a, 369–70). We now have a hoard that consists exclusively of gold staters of Dubnovellaunos, the only one of its kind. Dave Marvin kindly told me that there were five coins in all, dispersed over 100m at Heybridge (Kretz 2008, 19) (Figure 10). The last hoard we should mention is the Great Waltham find of issues of Dubnovellaunos and Cunobelin, with five and eighteen staters of each respectively (de Jersey and Wickenden 2004) showing that Cunobelin was indeed the direct successor of Dubnovellaunos in Essex.

FIGURE 10: The dispersed hoard of five gold staters of Dubnovellaunos from Heybridge. Copyright: Colchester and Ipswich Museum Service

LANDSCAPES, AGRICULTURE AND THE COAST

Iron Age Fields and Droveways

There were two kinds of field in IA Essex: long strip fields (which were rare) and small rectangular fields (which were common). Long narrow fields, often only 25m wide, of MIA date were found at St Osyth, with droveways running parallel to the long axes (Germany 2007, 43–4). Three more strip fields of similar width were laid out in the LIA at Slough House Farm near Heybridge (Wallis 1998a, 34–6). In no instance has it been possible to gauge the length of these strip fields. Small square or rectangular fields have been more widely reported. Examples of early first-century AD date from Chigborough Farm at Heybridge were 0.73 and 0.27ha in size. Wells with wattle linings there watered livestock in a sparsely wooded landscape of meadowland (Waughman 1998, 76–8, 104; Wiltshire and Murphy 1998, 196). Some bigger LIA fields at Stansted airport on the eastern settlement at the LTCP site occupied 0.8 and 1.75ha (Cooke 2008, 95–7). One of the biggest IA fields from the county was the LIA Enclosure D at Slough House Farm, a rectangle occupying 2ha interpreted as a livestock corral (Wallis 1998a, 34–5). This landscape of small rectangular fields is typical of the IA in southern England (Fowler 1981, 157–8). All these fields were identified as such from their boundary ditches. Unditched fields can be recognised from abraded pottery sherds that reached them in manure. Such may have been the case at Stanway, where residual MIA pottery from the LIA funerary Enclosures 3 to 5 looks like manure from fields that were not defined by ditches (Sealey 2007b, 54). The practice of manuring could be demonstrated at the Colchester garrison excavations because scraps of pre-LIA pottery there had found their way into field ditches in a landscape where no one lived (Sealey 2004c, 36–7). There is enough data for IA fields in Essex now to justify collation and synthesis along the lines attempted by Yates (2007, 22–8, 73–80, 82) for BA field systems in the county.

Running through IA field systems are the livestock trackways known as droveways. At Ardleigh, Droveway C10 of BA origin remained in use through the LIA until the Roman period. It could be traced for 1.35km across a landscape of small rectangular fields (Brown 1999, 178, fig.114). There was another one on the eastern edge of a field at Stansted airport on the eastern settlement at the LTCP site. Analysis of sediments indicated trampling by animals and concentrations of dung (Cooke 2008, 96–7). At Colchester, the junction of two LIA droveways that met at right angles shed an interesting light on stock management. Post-holes from a gate were found, along with smaller stake-holes from wicker fencing that had blocked the entrance. Parts of the droveway were gravelled to provide a firmer surface for livestock (Crossan and Masefield 2004, 18–19). A droveway of LIA to EROM date on the MTCP site at Stansted airport also had a metalled surface (Cooke 2008, 112).

Aspects of Food and Food Preparation

There are still only a few assemblages of animal bone for the IA in Essex, largely because many of the sites excavated are on gravel with acidic soils. No animal bone at all was recovered from the MIA village at St Osyth for this reason (Germany 2007, 115). Where bone has been recovered, as on the sites along the A120 highway, the quantities are too small to allow the identification of trends and little more can be

done than record the presence of the standard domesticated animals (Evans 2007). A rare exception is Stansted airport, where more bone than is usual for Essex was recovered. One of the interesting conclusions to emerge was that the numbers of cattle and sheep/goat farmed in the MIA and LIA were approximately equal, with pigs in a minority (Hutton 2004, 63; Bates 2008, 24).

Data on cereal cultivation continues to appear, but – as with animal bone – is in need of synthesis and evaluation on a county-wide basis. One of the more interesting cereal reports is that for MIA St Osyth where it could be shown that the four-post structures were indeed used for grain storage. It also emerged that this wheat and barley may have been sown in the autumn (Fryer 2007, 93). There were thirteen of these small and square four-post structures at St Osyth. They all lay alongside roundhouses and tended to occur in groups of three; sometimes an earlier structure was replaced by a later one in the same position. Typically they were 3m² (Germany 2007, 54, 56). A variation on the theme was reported from Stansted airport. On the eastern settlement at the LTCP site there, a sub-rectangular five-post structure was set centrally in an arc of gully suggesting that this particular structure had a circular roof with an eaves-drip gully (Cooke 2008, 98, 101).

Food and diet leads naturally to how food was prepared, and an important element in food processing was the quern. We now know that there was a long period of overlap between the saddle and rotary quern in Essex, and the more efficient rotary type may not have displaced the saddle quern there until late in the IA. Nearly a fifth of all Essex querns were imported from Kent, and the trade lasted throughout the period. Most of these querns in Kentish sandstone are found in coastal parts of south Essex (Buckley 1988, 74; Major 1995b, 36; Major 2004a, 34; Major 2004d, 136). Dr D.P.S. Peacock tells me that conglomerate querns from a source in Normandy reached the LIA site of Elms Farm at Heybridge. The actual cooking of food sometimes took place in dome-shaped clay ovens; part of one was found at MIA Stanway (Crummy *et al*. 2007, 38). But none of this means that everyone had enough to eat: a juvenile from a LIA ditch at Stansted had not enjoyed an adequate diet (Cooke 2008, 103, 120).

The Coast

There is one fish weir from the Essex coast with a radiocarbon date that would put it in the IA (Murphy and Brown 1999, 16). Suspicions that this is a rogue date (all the others are post-Roman) are heightened by the evident avoidance of fish as a food source around North Sea coasts in the period (Dobney and Ervynck 2007). We may never know if this taboo was an expression of distaste for fish or the opposite, but it is worth noting that a copper-alloy spout in the form of a bream from a strainer bowl of LIA or EROM date from just across the border with Suffolk at Mildenhall (Sealey 2004a) implies at least a sympathetic attitude towards fish.

Fish may have been avoided in the period but salt from sea water patently was not, as the many salt production sites along the coast called Red Hills testify. Hitherto most of these sites (where dateable) have transpired to be LIA or EROM. Salt production earlier has been deduced from finds of briquetage (fired-clay salt-making equipment) in MIA contexts, and it is reassuring that a Red Hill of that date has now been excavated, at Tollesbury Creek (Germany 2004). Since the 1993 Writtle conference, surveys of the coast have brought to light many more Red Hills (Murphy and Brown 1999, 16–17). Inland finds of briquetage continue to attract comment. Crummy (2007b, 377) suggested they might be relics of a trade in salted-fish from the coastline, but a reluctance to consume fish in the IA makes that less likely. Before we leave the Red Hills, attention should be drawn to the bracing critique of Sealey (1995) by Barford (2000).

STRUCTURED AND RITUAL DEPOSITION, AND BURNT STONES

Structured and Ritual Deposition

This is a topic that enjoys a vogue that would have been unthinkable fifty years ago, but nowadays excavation reports abound with accounts of deliberate ritual deposition; and some cases the sheer oddity of these deposits inclines one to endorse them as such. Examples from IA Essex include the complete pots buried in LIA to EROM ditches at Stansted airport (Cooke 2008, 118–20). Elsewhere at Stansted a pit had two complete cattle jaw bones laid flat in their context with burnt sandstone pebbles (Havis and Brooks 2004a, 28). At Cressing Temple the burial of a complete horse in the LIA suggests something out of the ordinary (Ennis 2004) (Figure 11). The ritual deposition of coins at the Harlow temple has been explored by Haselgrove (2005, 409–16). Claims that quartz pebbles in roundhouse gullies were placed there with ritual intent (Powell 2007, 58, 62; Powell and Biddulph 2007, 75) finds support in the Darmsden–Linton pots from Hunts Hill Farm at Upminster with a large pebble placed inside each of them (Cotton *et al*. 2011, 47, 49; Jones 2011, 128).

The Puzzle of the Burnt Stones

This leads to the neglected question of burnt stones in IA pits. More and more examples are coming to light (Havis 2007, 184; Havis and Brooks 2004a, 17; Bishop 2006, 13–14). The topic was thrown into high relief with the publication of some 100kg of burnt flint and sandstones of MIA date from Stanway (Crummy *et al*. 2007, 18–21). They are larger than the stones found naturally in the ground at Stanway. Although flint accounts for 95% of the stones in local gravels, the composition of the burnt stones was very different: approximately 90% were sandstone, and only 10% were flint. Evidently the sandstone pebbles had been collected for heating, rather than having been scorched *in situ* on the ground. Sandstone pebbles are homogeneous and expand and contract evenly with changes in temperature; as such, they would cope better than flint with rapid heating and cooling, so they were no doubt preferred to flint because they do not shatter from heat in the way that flint does.

It used to be thought that such heat-affected stones were pot-boilers, heated stones plunged into water-filled pots to heat the contents. This assumes that the pots could not stand direct exposure to a fire. Bearing in mind we now know that they could cope with thermal shock (Gibson and Woods 1990, 33–4), some other explanation must be sought. A possible solution of the burnt stone phenomenon came from MIA to LIA Pit 7123 at Stratford in east London (Hiller and Wilkinson 2005, 16–17; Bradley 2005, 37). Charcoal suggested the stones had been heated *in situ*, and the pit had seen use on more than one occasion. The report suggested it was connected with cooking but if so, there should be many more of these from

FIGURE 11: The late Iron Age horse burial from Cressing Temple. Copyright: Essex County Council

the county. It might instead have been a sauna with the stake holes around the edges supporting a covering to retain steam and heat, with users entering the sauna through a gap in the stakeholes (Barfield and Hodder 1987, 372–3). A pit dated *c*. 600–300 BC at Moor Hall Farm in Rainham with burnt stones had been lined with clay (Cotton *et al*. 2011, 50), and if the clay was there to make the pit water-tight we may have a further link here with heating water and saunas.

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Colchester: the years 1993 to 2008

Philip Crummy[1]

The fifteen years following the last Essex Conference saw various major opportunities for investigations in many places throughout the *oppidum* and the Roman colony. In particular, there were chances to work outside the town centre and examine the pre-Roman and Roman *oppidum* on a scale not possible before, especially at Gosbecks, Stanway Quarry, Abbotstone, Colchester Institute, and the sprawling site of Colchester Garrison (Fig. 1). Work was also possible to significant effect on medieval and later sites particularly those St Mary Magdalen hospital and church and the house of the Crouched Friars (Fig. 1).

ORIGIN AND DEVELOPMENT OF CAMULODUNUM

Christopher Hawkes in his 1947 review of the Camulodunum and its dykes (Fig. 1; Hawkes & Hull 1947) made three key assertions which still hold good today: 1) the date of the 'original occupation' of Camulodunum could not be established, 2) the dyke system developed in stages, and 3) the earliest dykes are the contour works at Gosbecks. He also believed that that the dyke system belonged 'essentially to the century of the British Iron Age preceding the Roman conquest of AD 43'. This is still a fair assessment, although the post-conquest element of the dyke system has turned out to be quite substantial (Hawkes & Crummy 1995, 177).

The numismatic evidence (largely) was and still often is taken to imply that Camulodunum changed hands several times as a result of inter-tribal warfare. Hawkes fully accepted this view to the extent that he equated the Late Iron Age start of the occupation of the Sheepen site with the foundation of Cunobelin's ''capital'', an event which he dated to *c* AD 10 when he believed that Camulodunum was recaptured by the Catuvellauni from Dubnovellaunus (seen as Trinovantian) who then fled to Rome in search of support from Augustus. This view was repeated in his essays for *Camulodunum 2* (especially pp 6–7) published in 1995 as *Colchester Archaeological Report* **11**. However, the start date of Sheepen has been repeatedly challenged over the years by various people (notably M R Hull, D Peacock, A Fitzpatrick, P Sealey, R Niblett, and C Haselgrove) who all suggested dates before *c* AD 10. In the early 1990s, Hawkes reviewed all the evidence and the conclusions drawn from it by the various protagonists (*Camulodunum 2*, 70–83). This led him to accept the proposition that the Late Iron Age occupation of Sheepen did indeed begin before *c* AD 10 but, following on from the analysis of Colin Haselgrove in particular, he came to the conclusion that the earliest phase of this occupation had been relatively minor and concentrated on the northern part of the site (ie his Regions 1, 2 & 4 on Fig. 2). Crucially he accepted that it must have been pre-Cunobelin in context.

The proposition that the Sheepen site was in existence before AD 10 received further support from archaeological excavations which started in 2006 in advance of major redevelopments at Colchester Institute (Fig. 2; Brooks & Holloway 2009). The area examined was Hawkes' Region 4 where, as we have just mentioned, occupation before *c* AD 10 has been suggested. This part of the Sheepen site proved to have been much busier than expected from the results of the Hawkes and Hull excavations of the 1930s because the area turned out to have been dominated by a substantial and unexpected gravelled road evidently leading south-eastwards at first to the west gate of the fortress and later, on the same site, to the west gate of the Roman town. The fact that the road was constructed to connect Sheepen with the Roman fortress/town indicates that the road and everything along its frontages must have been post-conquest in origin. Importantly, however, earlier material was found in this area which is datable not just to before the Roman conquest but to the *c* 50–10 BC range. Although small in quantity, this material was securely stratified in a timber-lined well (AF125) and a ditch ('leat') (Fig. 2), both of which appear to have been contemporary with it.

All this serves to help break the direct personal connection between the Sheepen site and Cunobelin and to underline the likelihood that Camulodunum, in its final form, was the product of a series of *ad hoc* defensive improvements and additions over a long period of time extending beyond the Roman conquest of AD 43. The scale of the excavations at Sheepen over the years, and the large volume of finds which the site has produced, have tended to give disproportionate weight to the significance of the site in the developmental history of Camulodunum. As has long been recognised (Hawkes & Hull 1947, 10), the origin of Camulodunum probably lies at Gosbecks, either in the earliest of the dykes there (the Gosbecks Dyke) or, more likely, the 'farmstead' which nestles nicely in its east-facing curve (Fig. 1; Hawkes & Crummy 1995, 95–105). In 1993, all that could be said of the foundation date for Camulodunum was simply that it must have been 'before *c* 25 BC' (Hawkes & Crummy 1995, 174). It is possible now to improve on this statement and push the date back to 'at least *c* 50 BC'. But the justification for this revision is tricky and tenuous, partly because of imprecision and uncertainties in the dating of pottery belonging to the century or so before the arrival of Gallo-Belgic wares in Britain *c* 10 BC.

The Stanway Quarry and Abbotstone sites (Fig. 3A; Crummy *et al* 2007, 7–13 and Pooley & Benfield 2005 respectively) both produced apparently unbroken continuity of sequences beginning in the Middle Iron Age and continuing into the Roman period. Each started with a Middle Iron Age enclosure each evidently containing a round-house. At the Ypres Road site, as part of the Garrison excavations, a Middle Iron Age round-house was found inside a rectangular enclosure (Fig. 3B1 & 3B2). No direct continuity could be proved with Camulodunum, but the enclosure shared the same alignment as a Late Iron Age droveway which cut it (Brooks & Masefield 2005), suggesting that continuity of a sort must have applied between the round-house and the defended Late Iron Age settlement. At Gosbecks in 1995–7 and 1999 (Crummy *et al* forthcoming), small-scale excavations produced the only sherd of Dressel '1a' amphora yet known from Colchester. This is extremely interesting because the number of amphora sherds recovered so far from Gosbecks is tiny whereas the number

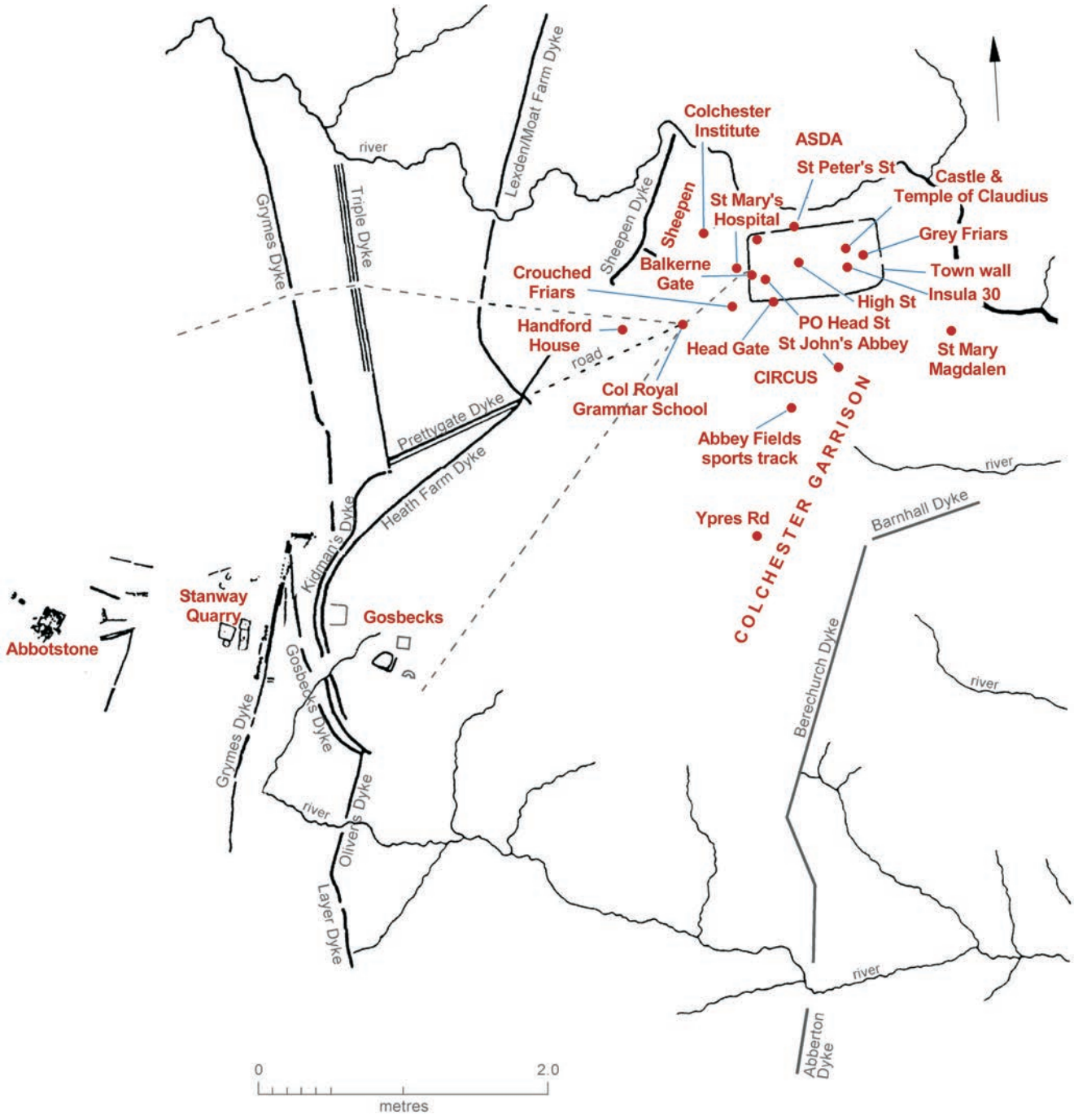


FIGURE 1: Plan of Camulodunum, showing the locations of all the sites mentioned in the text (including those of later date).

from the rest of Colchester, especially Sheepen, is relatively vast. Despite the problems about the typological value of dividing Dressel 1 amphoras into 1a, 1b, and 1c (Sealey 2009, 6–7 including footnotes), this discrepancy strongly suggests that Gosbecks is likely to be earlier than Sheepen in origin and that, therefore, a mid 1st century BC date (at the latest) for the start of Camulodunum is highly likely.

Another important feature of the work of the last fifteen years in Colchester is the discovery of the sites of possibly as many as three round-houses (Stanway Quarry (Crummy *et al* 2007; Abbotstone (Fig. 3A; Pooley & Benfield 2005); Ypres Road (Fig. 3B1 & B2; Brooks & Masefield 2005, 8–13, figs 4–12). None had been found before in Colchester. Interestingly – and probably very significantly – they all appear to date to the Middle Iron Age and, what is more, no Late Iron Age houses have been recognised anywhere in Colchester. This suggests that the inhabitants of the Late Iron Age settlement did not live in round-houses but in some other form or forms of dwelling which have not left a clear-enough imprint for us to recognise.

An explanation for this profound change comes from the work at Stanway Quarry. Here the burial rite, with its chambers, rectilinear enclosures, and the breaking of pots, points to a connection with the Catalauni of the Champagne region in France, whose mother settlement was Châlons-en-Champagne (Crummy *et al* 2007, 451–6). Given that round-houses are a peculiarly distinctive feature of the British Iron Age, their apparent absence in Late Iron Age Colchester (and elsewhere, come to that) provides *prima facie* evidence to support the

FIGURE 2: Colchester Institute 2003–7: Location and general site plans.

proposition that the settlement was under the influence of the Catalauni, ie the Catuvellauni, from the middle of the 1st century BC if not before.

This interesting conclusion opens up the distinct possibility that Camulodunum was the stronghold of Cassivellaunus which Julius Caesar stormed in 54 BC during his second invasion of Britain (*De Bello Gallico*, 5.21). Not only does the date work in terms of our revised date for the foundation of Camulodunum, but so too does the geographical location (Cassivellaunus was harassing the Trinovantes) and the size

FIGURE 3: Farmsteads.
Abbotstone (1999–2001). A: site plan of Late Iron Age to Roman-period farmstead. Ypres Road (2003). B1: artist's impression of Middle Iron Age farmstead (by Peter Froste). B2: site plan.

of the settlement. Cassivellaunus' stronghold was so big that Caesar, despite the size of his army, attacked it on just two sides and some of the British were able to escape out of a third. The currently-favoured candidates for his base, of which Wheathampstead is the largest, seem to have been far too small, whereas Camulodunum was many times larger than these and of a scale which would fit Caesar's account of his attack (Crummy 2009a).

Camulodunum in the Roman period

The abrupt end of the Sheepen site in AD 61 (Hawkes & Hull 1947, 56) might suggest that the rest of Camulodunum would have suffered a similar fate and that the occupation which was widespread there did not survive the Boudican revolt. However, recent excavations, especially those at Colchester Garrison, have shown that this was not the case and that occupation within the defended parts of the pre-Roman settlement

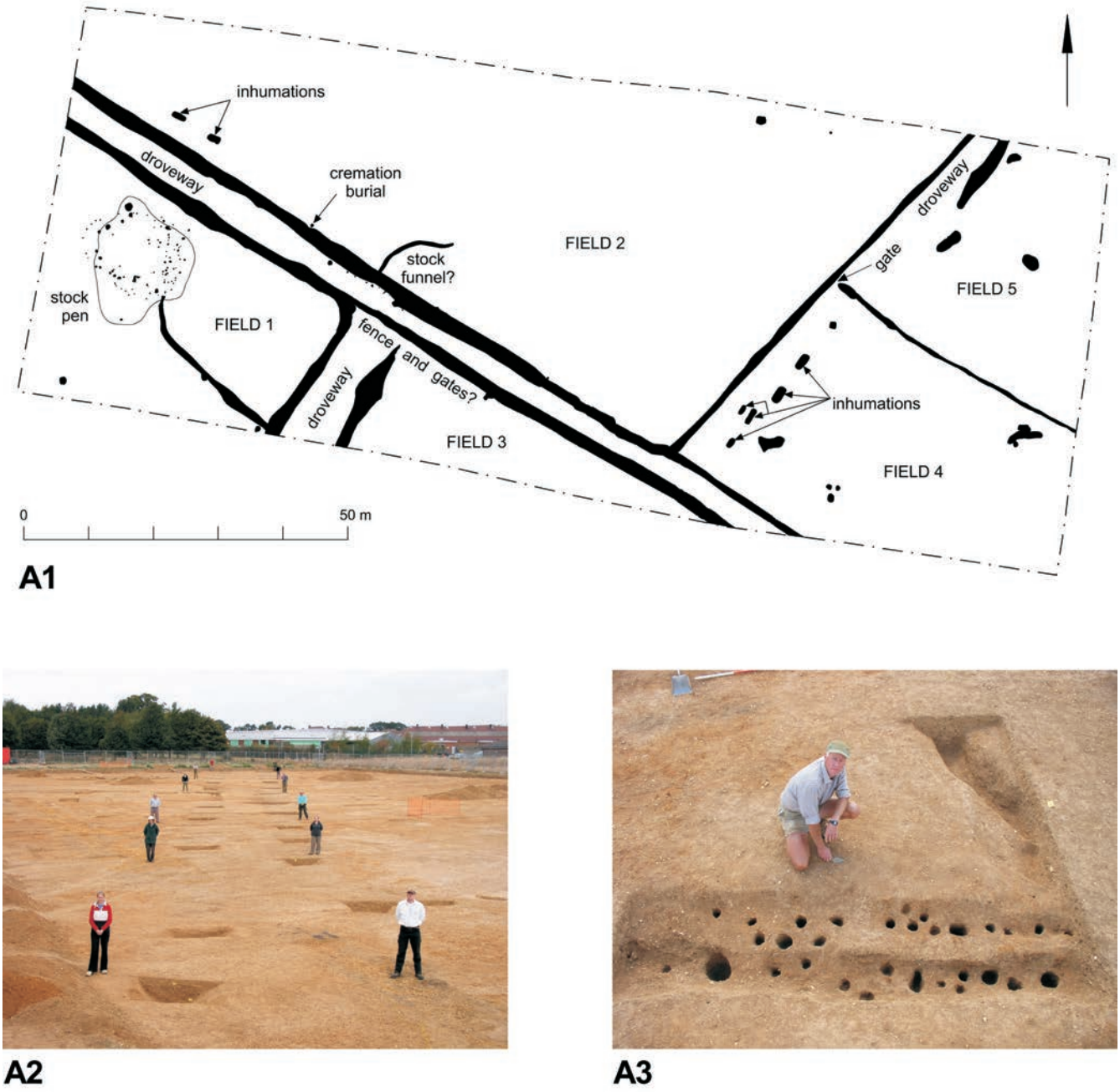


FIGURE 4: Colchester Garrison: Area 6 (2003).
A1: plan. A2: photograph along droveway. A3: part of a boundary along the droveway where there had been at least two phases of fence and a gate.

continued as before into the Roman period, in parallel with the Roman colony. The Garrison excavations showed that the system of ditched droveways, so clearly evident through cropmarks at Gosbecks (Hawkes & Crummy 1995, 96, fig 5.1), originated in the Late Iron Age and survived throughout the Roman period when some of them were metalled with gravel after having developed though long-term use into hollow ways.

The extent of the network of these droveways, coupled with the distribution of the known Roman-period occupation sites within the *oppidum*, suggests that much of the area inside the defences was occupied but the buildings in it were thinly spread and in the form of small farmsteads, perhaps each with a few fields and sharing communal woodland and open land for pasture. A clear illustration of this sequence was provided by Area 6 of the Garrison excavations (Fig. 4; Brooks 2005). Here the site was crossed by a droveway flanked on both sides by fields devoted to stock-raising. This was indicated by short stretches of ditch and a gate which seems to have been used for stock control. Moreover, a phosphate-rich hollow in one of the fields appeared to show a place where stock liked to gather. Although nothing was found of the houses of the family or families who worked these fields, inhumation burials close to field boundaries (Fig. 4) suggest that they must have lived close by.

Although the colony and Camulodunum co-existed side by side, presumably as one administrative unit, the archaeological evidence points to the two places having very different living standards. Significantly, the identification of the physical remains of house sites within Roman-period Camulodunum continues to prove difficult even where sites

have provided sufficient indirect evidence for their existence. The conclusion which we can draw from this absence is that the buildings inside and immediately around the walled town were built to a higher standard than elsewhere. Importantly, this difference must tell us that the people living in the colony enjoyed a higher standard of living than those living in what had been the pre-Roman *oppidum*.

Roman-period funerary sites and practices

Another area where there have been significant advances is in funerary studies, because of the numbers and scale of the excavations which have taken place in the cemetery areas.

The pattern recognised in the 1990s, that inhumation burials were closer to the town centre than cremation burials (Crummy *et al* 1993, 263–4) has been borne out in recent years. The explanation given then still holds good now. Extramural developments around the town largely disappeared in the late 3rd and 4th century as the number and size of the houses inside the walled area declined. The change released more extramural land for burials which, at this date, was usually by inhumation. Hence burials closest to the town walls tends to be of this type. This observation was borne out at the St Mary's Hospital site which lies just outside the walled part of the town and where there were 104 inhumation burials as opposed to only two cremation burials (Benfield 2008b). (See below for more about the St Mary's Hospital site.)

More cremation burials have been excavated over the last fifteen years than inhumation burials because the balance of redevelopment has shifted towards the suburbs away from the town centre and the area immediately around the walls where inhumations dominate. This explains, in part, why, for the first time in Colchester, cemeteries with large numbers of cremation burials have been investigated on useful scales. The main sites where this has occurred are at Handford House off Beverley Road (Fig. 5; at least 51 cremation burials, 9 inhumation burials, 1 pit with pyre debris, and 2 *busta*; Orr 2010), the Abbey Field sports track site (71 cremation burials and pyre-related features; Crossan 2001a & 2001b), the ASDA site (60 cremation burials and pits with pyre debris; Shimmin 2009), and Colchester Garrison (290 inhumations, at least 139 cremation burials, 9 *busta*, and 73 pits with pyre debris; Pooley *et al* 2011).

As a result of this work, various aspects of cemeteries and funerary technique have been recognised and explored, including burial plots, pyres, pits with pyre debris, and *busta*. The old idea challenged some years ago in Crummy *et al* 1993 (p 261), that the Roman town had large cemeteries covering large blocks of land, is clearly not tenable. The so-called Lexden cemetery, the Union cemetery and so on, as described by Rex Hull (1958, 250–8), can now be seen to have been much more complicated. These were not single cemeteries but were simply parts of Colchester which were dominated by burial plots of various kinds and wildly different sizes which were used on a familial basis or in connection with some socio- or religious grouping. The usual broad-brush trends in terms of general burial rites are clear enough in these areas: cremation first, then inhumation without orientation, and then inhumation with orientation, but everywhere there are plenty of exceptions and deviations to underline the complexity of burial practice and the dangers of over-simplification when it comes to interpretation. The challenge now and in the future is to disentangle these apparently haphazard spreads of burials in terms of plots, landscape context, and social networks and groupings.

One interesting example in this kind of interpretation is provided by the ASDA site excavated in 1996–99 (Shimmin 2009). Here the grave goods were distinctly lower in quality than those found in the cemetery areas crowded around the walled town. The ASDA group hangs together as a distinct group as if it was the burial place of a relatively poor, low-status family or group of workers engaged long-term in a common industry such as potting or quarrying sand, gravel and clay. (There are kilns in the area.)

Another example is provided by a group of eight burials on the south side of the circus in the form of small barrows (Fig. 5C). These were recognisable as single cremation burials each enclosed by a circular- or, in all but one case, pennanular-ditch. The rite is very distinctive, with parallels suggesting the presence of a family or other group of people with a Germanic background (Pooley *et al* 2011, 32–3). There could perhaps be an association here with arrangements for the defence of late Roman Britain or this could be the burial ground of a group of immigrants who settled in Colchester for some other reason.

Among the grave goods, particularly significant was the remarkably evocative evidence at the Handford House site for lamps having been buried in the grave when still burning (Fig. 5A1 and A2; Orr 2010). This reinforces the evident truth that empty, usually upright, pots in graves are in fact all that survives of supplies of food, drink and maybe clothes and other items laid out in readiness for the dead person to use, presumably during his or her journey to the afterlife.

This theme was picked up at the Stanway Quarry site where there were some rich assemblages clearly laid out in the graves as if ready to use. Although small in numbers of burials, the cemetery at the Stanway Quarry (1987–2003) proved to be very significant because of the distinctive burial rites involved and the fact it was a British site bridging the pre-Roman and early Roman periods (Crummy *et al* 2007). Seven cremation burials had been placed in four enclosures where there were also four wooden mortuary chambers, two identifiable pyre sites, two mortuary enclosures, and the remains of 149 pots in the ditches plus at least 57 in the chambers, plus fragments from glassware and other objects in the chambers which had evidently been smashed during funerary rites. Some of the cremation burials were well endowed and of high-ranking individuals. One was evidently a warrior because he was buried with a shield. The other was a doctor/surgeon as indicated by a set of surgical instruments and possibly the presence in his grave of artemisia, a herb with medicinal properties.

A temple-tomb was found in 2005 in the grounds of the Colchester Royal Grammar School (Fig. 5E1 & E2; Brooks 2006). It must have been a prominent landmark in its day since it stood at the road junction where the Colchester–London road took a sharp bend towards the Balkerne Gate. The building was square with a perimeter wall tightly enclosing a hexagonal central cell on a massive foundation which seems to indicate that it had supported a tower. There were six cremation burials, two inside the hexagon and four within the square. Unusually the cremated remains included a mixture of cremated animal bones as well as human ones. These included sparrowhawk, prompting speculation that the dead person might have been associated with falconry or that the presence

FIGURE 5: Roman burials and burial practice.
Handford House (2003). A1–A2: two lamps which were buried in their graves when still alight. Their burning wicks were shielded from the soil backfill with large fragments of pots. A3: amphora burial which contained a cinerary urn with cremated remains, two small pots and a ceramic lamp. A4: inhumation with a shale armlet. Colchester Garrison (North Circular Road) (2007). B: *bustum*. Colchester Garrison (Napier Road) (2005). C: remains of at least 8 cremation burials each inside either a circular or a pennanular ditch. Abbey Field sports pitches (2000). D: tile tomb (reconstructed). Colchester Royal Grammar School (2006). E1–2: temple-tomb with hypothetical reconstruction.

of the bird bone was as a result of the burial rite (P Crummy 2006; N Crummy 2006).

Built-up part of the Roman town

In the colony, various area excavations took place in the town, especially the western half of it. The largest of these were at the former Post Office site in Head Street and the former St Mary's Hospital site at the top of Balkerne Lane. These investigations have revealed phases of streets and buildings which conform to and enhance the sequence of legionary fortress to town as revealed in earlier town-centre excavations (Crummy 1984, 15–18).

At the St Mary's Hospital site (Fig. 6; Benfield 2008b; Crummy 2002; Crummy 2003a; Crummy 2004), a hitherto-unknown street was discovered which led north-westwards out of the Balkerne Gate. A sequence of buildings dating from the AD 50s to *c* AD 300 lined both sides of the street. Over 100 inhumations lay to the north in a burial ground which extended up to the west side of the town ditch. The sequence and dating matched those found during the Balkerne Lane excavations in the 1970s (Crummy 1984, 93–153).

The excavation at Head Street on the site of the Post Office in 2000 (Brooks 2004; Crummy 2001a) produced a complicated sequence of occupation which was rationalised in terms of five periods. The earliest was represented by a building which had belonged to the legionary fortress. In characteristic military fashion, its walls were of clay block set on top of plinths made of gravel pebbles in mortar. Too little of the building was uncovered to say anything about its function in the fortress, but it had been destroyed by fire in the Boudican revolt of AD 61, showing that the building had not been demolished when the fortress was evacuated but had been re-used in the new colony. Two periods of buildings followed during the post-revolt rebuilding, the second of which was a substantial house. There was little evidence on the site of Roman-period occupation later than the late 3rd century. This suggests that the house had been demolished around this time and never replaced. The Head Street site conforms to the pattern seen in many places inside the town walls, where large houses were demolished without replacement *c* AD 275–300, and provides more support for the conclusions that the town was in serious economic decline from that time onwards (Crummy 1992, 18–20; Crummy 2001b, 113–18).

Roman town wall

The town wall – the way it was built, its date, gates, interval towers and culverts – is better understood (Crummy 2003b).

A detailed reassessment of the construction of the wall based on the Balkerne Gate and the adjacent stretches led to the identification of subtle changes in the fabric which revealed that the wall had been erected by different gangs each working on their own section of the wall (Crummy 2003b).

A major section was excavated behind the wall in the grounds of the Sixth Form College and revealed a very well-preserved inner face. The section was cut through the bank behind the wall. Under the bank, construction levels for the wall provided substantial stratigraphical evidence to support the conclusion that it had been built in the immediate post-Boudican period. The ground at the base of the wall is saturated because of underground springs. Small wooden piles had been driven under the wall as a preliminary to its construction to help stabilise the ground. Some of these were removed during the excavation for dendrochronological dating but they proved to be too narrow and too compressed for the purpose (Brooks *et al* 2009; Górniak 2006).

And we now have a more reliable plan for Roman Head Gate (Shimmin 2006) and have identified a possible Roman gate in St Peter's Street, along with well-preserved wooden drains on either side of the street out of the ?gate (Wightman 2010; Crummy 2008c).

Roman public buildings

Excavations on the site of Colchester Garrison led to the discovery of Colchester's Roman circus (Fig. 7; Crummy 2005, 2008a, 2008b, 2009, 2011). The complete plan of the building was recovered by means of relatively limited investigations around its circuit. The building proved to be of average length (*c* 450m) but was narrower than normal (71.1–74.3m excluding buttresses) presumably because it was fitted out with only eight gates rather than the more usual twelve (Crummy 2011, 1344, 1363–7). The circus was constructed in the early 2nd century when Colchester was entering its most prosperous phase. It ceased to be used during the last quarter of the 3rd century as the town started to decline.

Despite the discovery of the circus, one major area which continues to represent a gap in our knowledge of the Roman town is its public buildings. The discovery of the Roman circus was of course a major step forward, but the realisation that the town possessed its own circus served to emphasise that it probably also had a amphitheatre, and it is still far from clear where that might have been located. Similarly, the sites of the town's basilica, forum and baths all remain unidentified.

The long-favoured and most obvious site for the basilica is Insula 30, the large *insula* immediately south of the Temple of Claudius. However, recent work suggests that this *insula* was probably in fact not one *insula* at all, but two. If correct, then the basilica must have stood elsewhere. The only other space within the walls which would have been wide enough for something as big as the town's basilica would have been immediately north of the Temple of Claudius (ie the north side of the temple precinct), but such a solution is problematic.

Although the site of the baths remains elusive, at least something of the baths have at least been recognised. The stone-for-stone drawn survey of Colchester Castle in the 1980s revealed in its walls what can only be remains of the hypocausts of the public baths (drawings held by CAT). If Insula 30 had really been two separate *insulae*, then the one on the west would become the prime candidate for the site of the baths, partly because this is where William Wire observed what he described in 1849 as 'three hypocaust fire-places with round headed arches...' (Hull 1958, 204).

Excavations at Gosbecks following the establishment of the archaeological park there in 1995 included a series of exploratory trenches across most of its key archaeological features, ie the Romano-Celtic temple, the ditch of the temple enclosure, the portico, and the theatre enclosure ditch (Crummy 1996). The temple ditch (Fig. 8A1) proved to be 3.6 m deep with fragments of mid 1st-century pottery in its base reminiscent of the broken vessel fragments in the enclosure ditches at Stanway. A collapsed fragment of a column in the ditch (Fig. 8A4) provided physical evidence

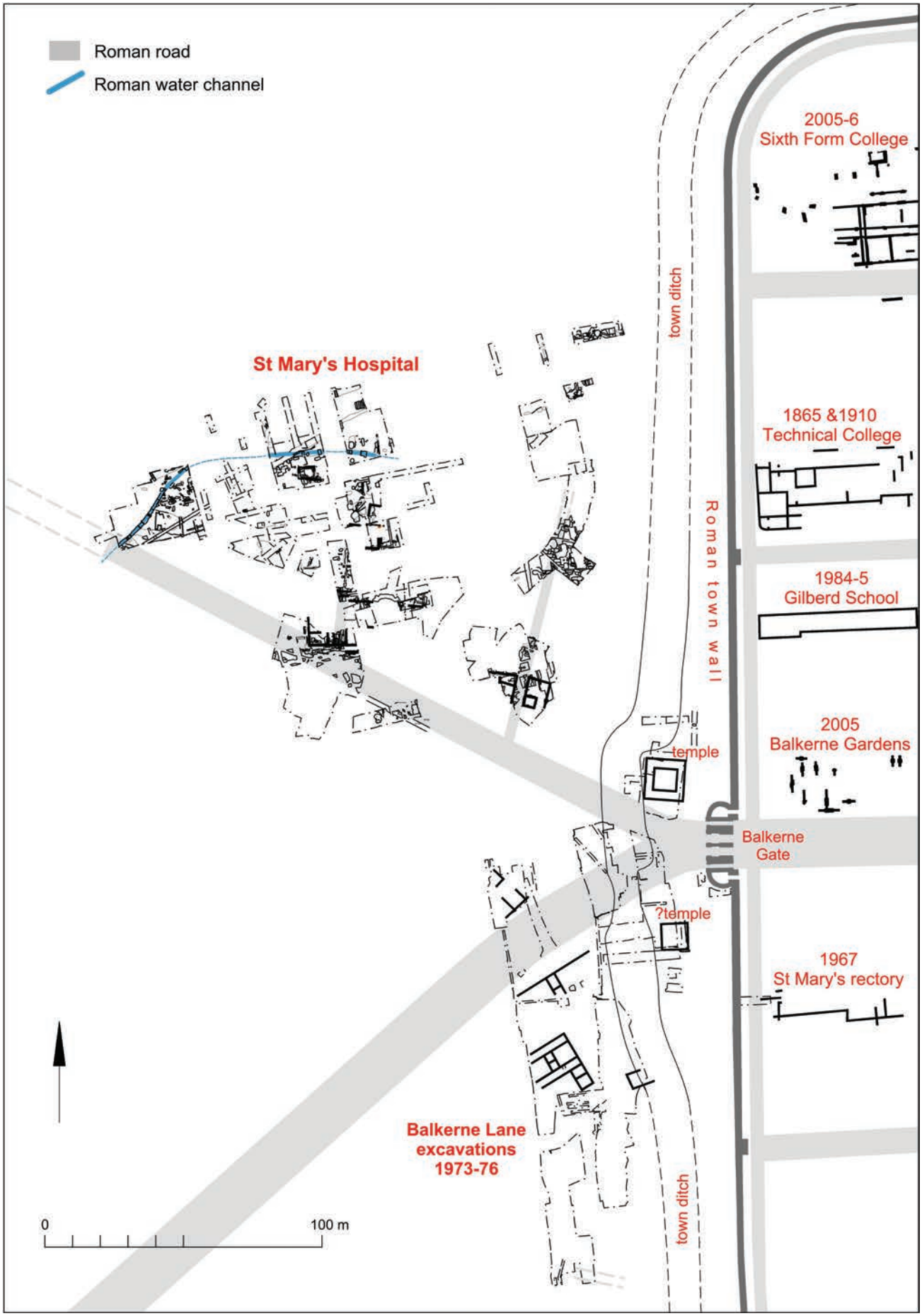


FIGURE 6: St Mary's Hospital site (2001–3) in relation to the Balkerne Lane site excavated 1973–6 and west side of the walled Roman town. The Roman road discovered on the St Mary's Hospital site (extends south-east/north-west) is evidently the same road as the one found on the Colchester Institute site (shown on Fig. 2).

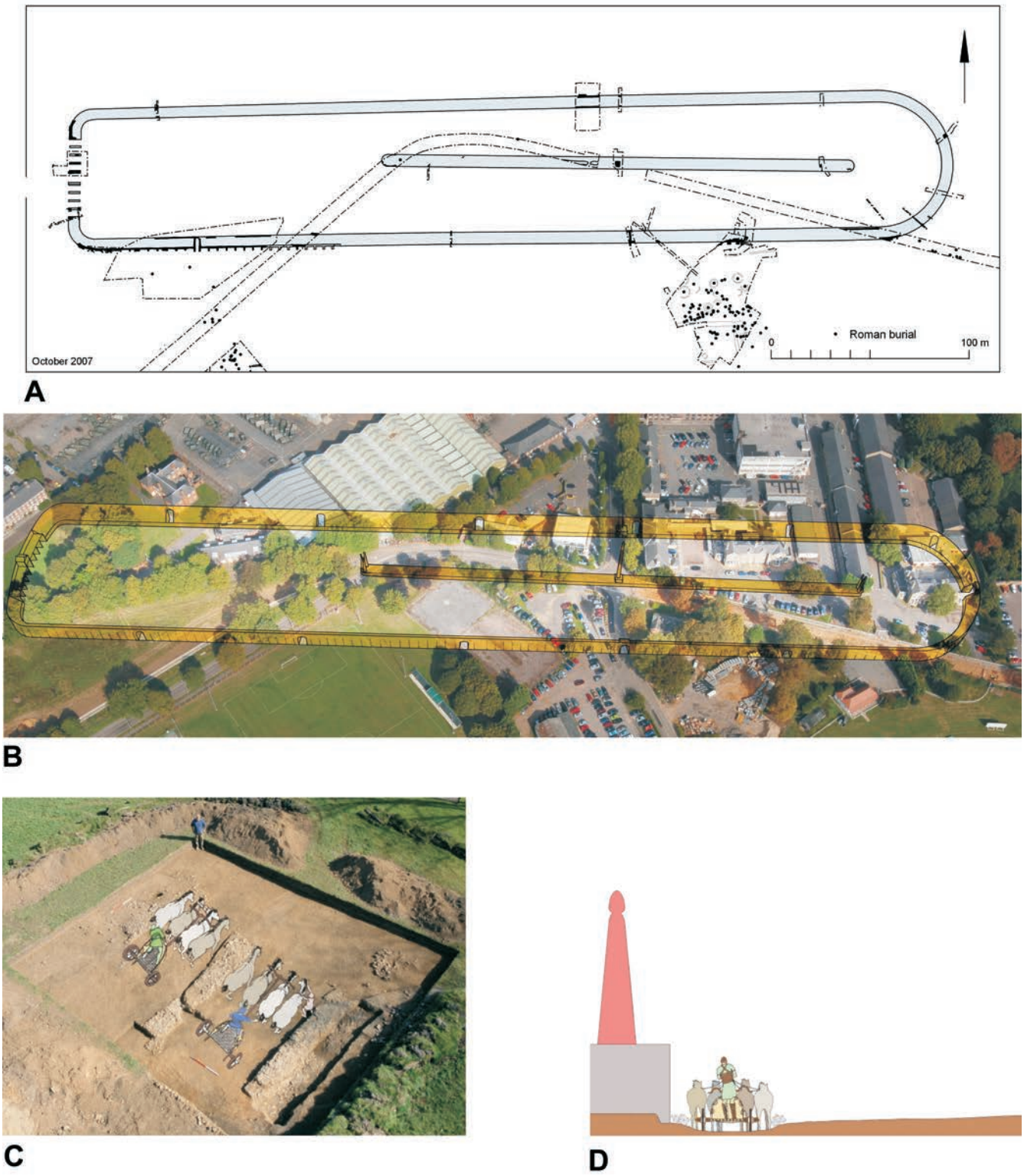
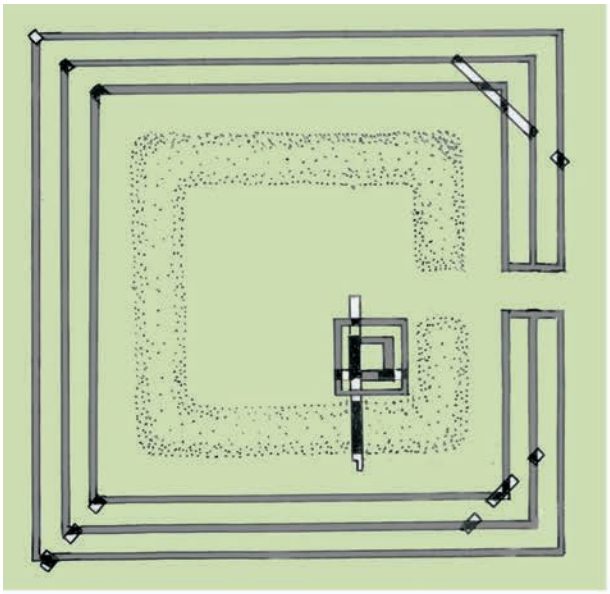
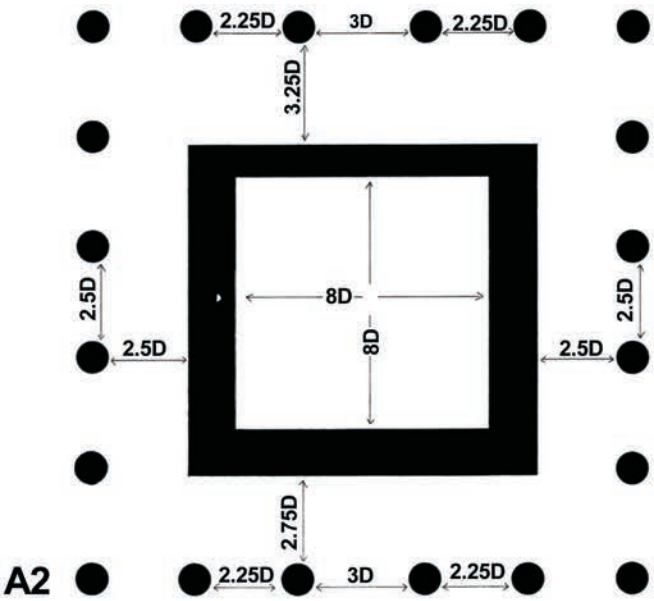
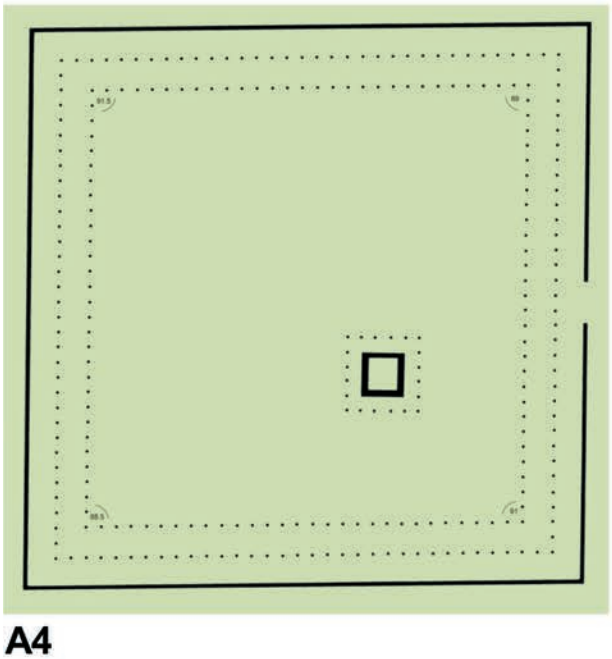


FIGURE 7: The Roman circus.
A: general plan. B: reconstruction of the circus superimposed on a photograph taken in 2005 (Crown copyright reserved). C: Two of the starting gates excavated in 2007 with two *quadrigae* superimposed for scale. D: reconstructed section through the arena surface at the near turning-post, showing the pattern of erosion caused by the chariots performing their 180-degree turns.

for the superstructure of the temple. The recovery of accurate ground-plans for the temple portico (Fig. 8A1) and the Romano-Celtic temple made possible reconstructions of both buildings using Vitruvian principles (Fig. 8A2, A5, & A6). The temple portico was laid out with columns at centres 18 Roman *pedes Monetales* apart. The two rows of columns and the outer wall are each 36 *pedes Monetales* apart (centre to centre) (Fig. 8A5). The distances between columns seem impressively accurate with a convincingly close level of fit with the building's ground-plan that strongly supports this interpretation. However, the right-angles are not nearly so precise, perhaps because the land slopes to the north, but this does not affect the validity of the reconstruction in terms of the layout and spacing of the columns and their spatial







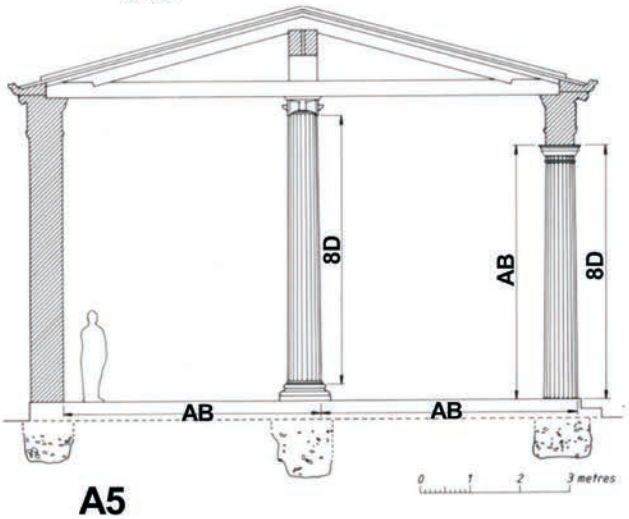


FIGURE 8: Gosbecks Romano-Celtic temple and portico.
A1: Plan of foundations of temple and portico in relation to the earlier ditched enclosure. A2: hypothetical reconstruction of the ground-plan of the temple. A3: part of a collapsed temple column found in the upper fill of the enclosure ditch. A4: hypothetical reconstruction of the ground-plan of the portico. The dots show the centres of the columns. A6: hypothetical reconstruction of the portico in terms of column diameters (D) based on Vitruvian principles.

relationships to the outer wall. The reconstruction for the Romano-Celtic temple has been achieved in terms of column diameters following the principles described by Vitruvius but the result is not compelling (Fig. 8) like that for the temple portico. However, the building does seem to have been octastyle in design.

ANGLO-SAXON AND NORMAN COLCHESTER

Apart from a small quantity of probable 9th-century material from a badly damaged site on the High Street, almost nothing of consequence has been added to our knowledge of Anglo-Saxon Colchester, simply because opportunities to examine the right sites have not presented themselves and preservation of those sites is poor. However, the remains of medieval and later houses have been investigated where frontages survive intact (ie out of the town centre), and significant advances have been made in what we know about Colchester's medieval monastic institutions. A partial ground-plan has been recovered for the church of the Crouched Friars (Benfield & Brooks 2007; Benfield 2007 & 2008a), the St Mary Magdalen church and hospital was more or less completely excavated (Crossan 2004) and, for the first time, little fragments have been seen of the church of Grey Friars (Orr 2003; Crummy 2007) and the monastic and later buildings in the precinct of St John's Abbey (Brooks *et al* 2008).

THE MODERN ARMY IN COLCHESTER

The recent work at Colchester Garrison led to the recording of various features relating to the 20th-century Garrison, especially practice trenches and air-raid shelters (Lister & Orr 2005; Lister 2008).

PUBLICATION AND PUBLIC ACCESS AIMS

Long-term publication problems are being addressed with the establishment of a website (http://cat.essex.ac.uk) which it is hoped the addition of already-published material will make large enough and comprehensive enough to become the *de facto* place to publish all Colchester reports in future.

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Aspects of Roman Settlement in Essex

Maria Medlycott and Mark Atkinson

INTRODUCTION

In the 15 years since the Writtle Conference, our understanding of Roman Essex has advanced considerably, largely as the result of development-led fieldwork. In addition, publication of important backlog sites has been aided by substantial grants from English Heritage and the Heritage Lottery Fund. National surveys include *Britons and Romans: advancing an archaeological agenda* (ed. James and Millett 2001), which provides a synthesis of significant new knowledge and future research themes covering the Iron Age/Roman and Roman/Medieval transitions; Romanisation; material culture and identity; rural society; urbanism; zooarchaeology; and soldiers and civilians. More recently Jeremy Taylor has published *An atlas of Roman rural settlement in England* (2007), which characterises, maps and assesses later Iron Age and Roman rural settlement evidence across England.

This paper aims to look at the development of settlement in Essex within a landscape context (Fig. 1). The types of settlement; towns, villages, villas, farms and cottages are considered individually. This is followed by an attempt to place the settlement types within the broader landscape, so that patterns relating to siting, density and land-use can be considered. To this end, recently published fieldwork on two of the largest field projects in the county, at Stansted Airport and along Stane Street (roughly equivalent to the line of the modern A120 between Braintree and Stansted Airport) provides study areas for detailed consideration.

It should be noted that Colchester and its immediate environs are not discussed as they form the topic for a separate paper within this volume.

URBAN AND VILLAGE SETTLEMENT

The following itemises the considerable fieldwork and publication progress since Wickenden's (1996) summary. Two significant projects have either come to completion or are about to be published, namely the synthesis of the many unpublished excavations in Roman Great Chesterford (Medlycott 2011) and the very large-scale excavations at Elms Farm, Heybridge (Atkinson and Preston forthcoming).

Great Chesterford

The recently published synthesis of the many unpublished excavations in the important Roman town of Great Chesterford since the mid 19th century (Medlycott 2011), provides a much better framework for understanding how the town developed. Geophysical survey has provided the greatest insights/detail over a large area of the town and the impetus to re-evaluate its development and layout (Fig. 2). The north-eastern corner of the fort has been identified and it is evident that the original extent postulated by Rodwell was correct (Rodwell 1972, 290–93). The 'annexe' ditch appears to have been a sub-division of the fort interior. Within the town area the survey identified a large market-place, flanked by substantial masonry buildings. These may have included official buildings such as a *mansio* or a *macellum*. On the northern side of the market-place was an octagonal structure, probably a temple.

Six principal roads led into the market-place, and much of the town was subdivided by lanes, forming a regular planned appearance on its western side. The lanes were probably flanked by timber-framed buildings. Extensive areas of pitting are also visible on the survey. Outside the town were extensive cemeteries and evidence for extra-mural settlement. The presence of a second walled enclosure to the south-west of the main walled town area has been confirmed by small-scale excavation. Within this was found evidence for settlement, to go with the earlier burial and ritual pit evidence from this area (Garwood 2004).

Analysis of the faunal remains from a series of very large, well stratified pits at a temple site outside the town to the east identified the remains of over 1,000 lambs (Baxter 2011). There was evidence for specific sacrificial dates, in the late 1st to early 2nd century they were slaughtered at four times during the year in April, May, June–July and January–March. However by the mid–late 2nd century this changed to a single kill-off phase in July. Selected body parts, namely the left shoulder and fore-leg and the pelvis and back-legs were removed from the site. Smaller numbers of domestic fowl were also killed; many of these were newly hatched, most of the rest were cocks. In addition to the sacrificing of animals, goods were being manufactured for deposition at the temple, including votive leaves and non-functional brooches.

It is suggested that Great Chesterford took on a more significant role in the 4th century, culminating in the construction of the walls as a centre for local administration and possibly as an inland component of the Saxon Shore defences. The fate of the town at the end of the Roman period is not clear. An extensive Anglo-Saxon cemetery (450–600) has been excavated immediately to the north of the town, and there is some evidence for individuals using Romano-British burial practices being included within the cemetery (Evison 1994).

Chelmsford

The Roman town of *Caesaromagus* was established on the site of a mid 1st century settlement, probably a farmstead. A short-lived Roman fort was built to the south of the river crossing in the aftermath of the Boudiccan revolt, with a detached annexe, a bath house and a temple precinct. After the abandonment of the fort in *c.* AD 70, a civilian settlement developed along the London–Colchester road and a side-road to the east which led to Heybridge. The fort annexe was replaced by a series of enclosures beside the London–Colchester road interpreted as a 'road station', a forerunner of the later *mansio*. The town was extensively re-planned in the Hadrianic/early Antonine period (*c.* 120–150), with the addition of a *mansio*, initially built as a temporary timber structure, but soon rebuilt in masonry with a remodelled bath house. The town grew to its maximum extent in the mid 2nd century, with new building plots being laid out along the London–Colchester road. Earthwork defences were constructed in the Antonine period (*c.* 160/75) to defend the

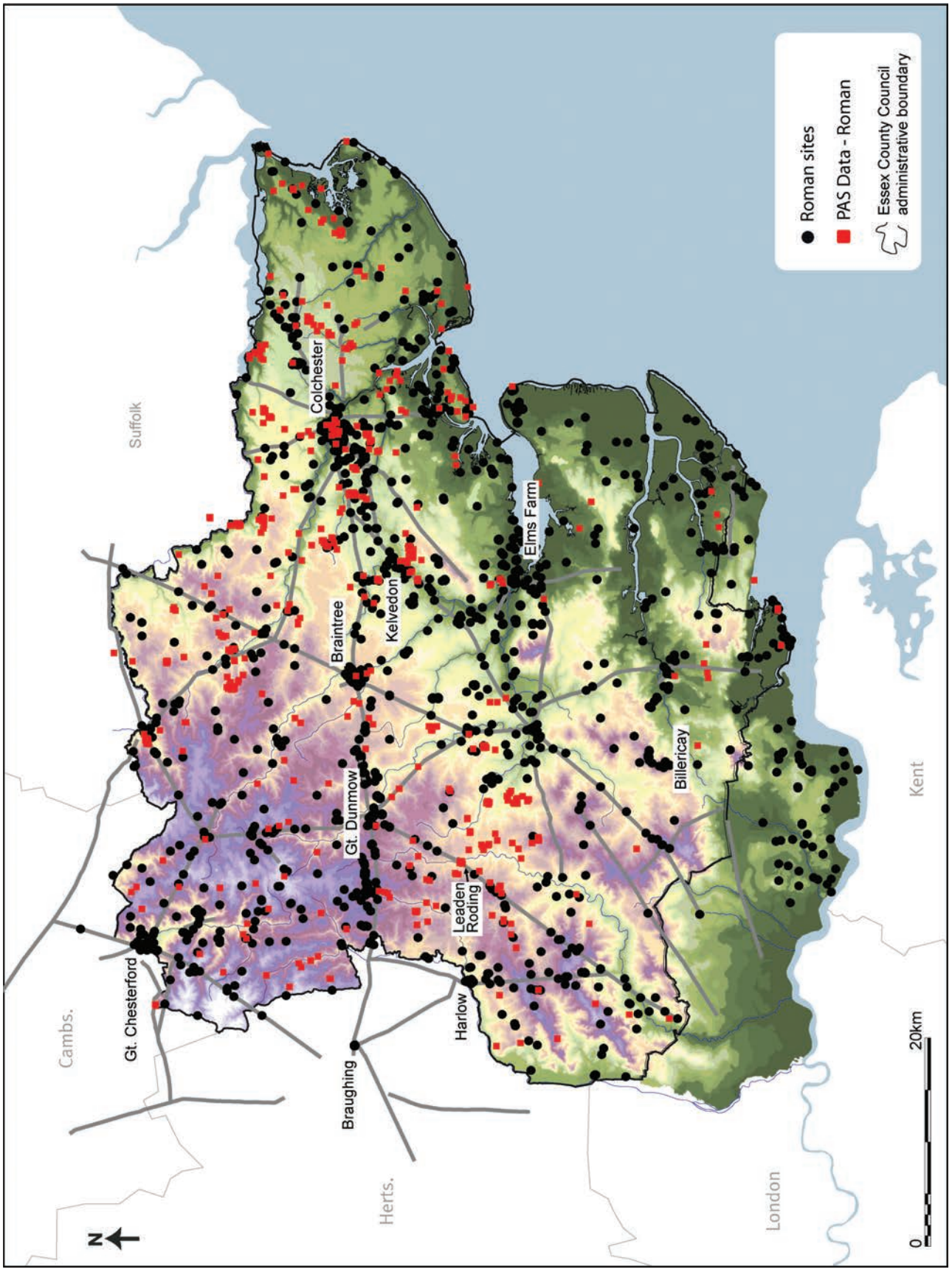


FIGURE 1: Overall map of Roman Essex © Crown copyright. All rights reserved. Essex County Council 100019602, 2013

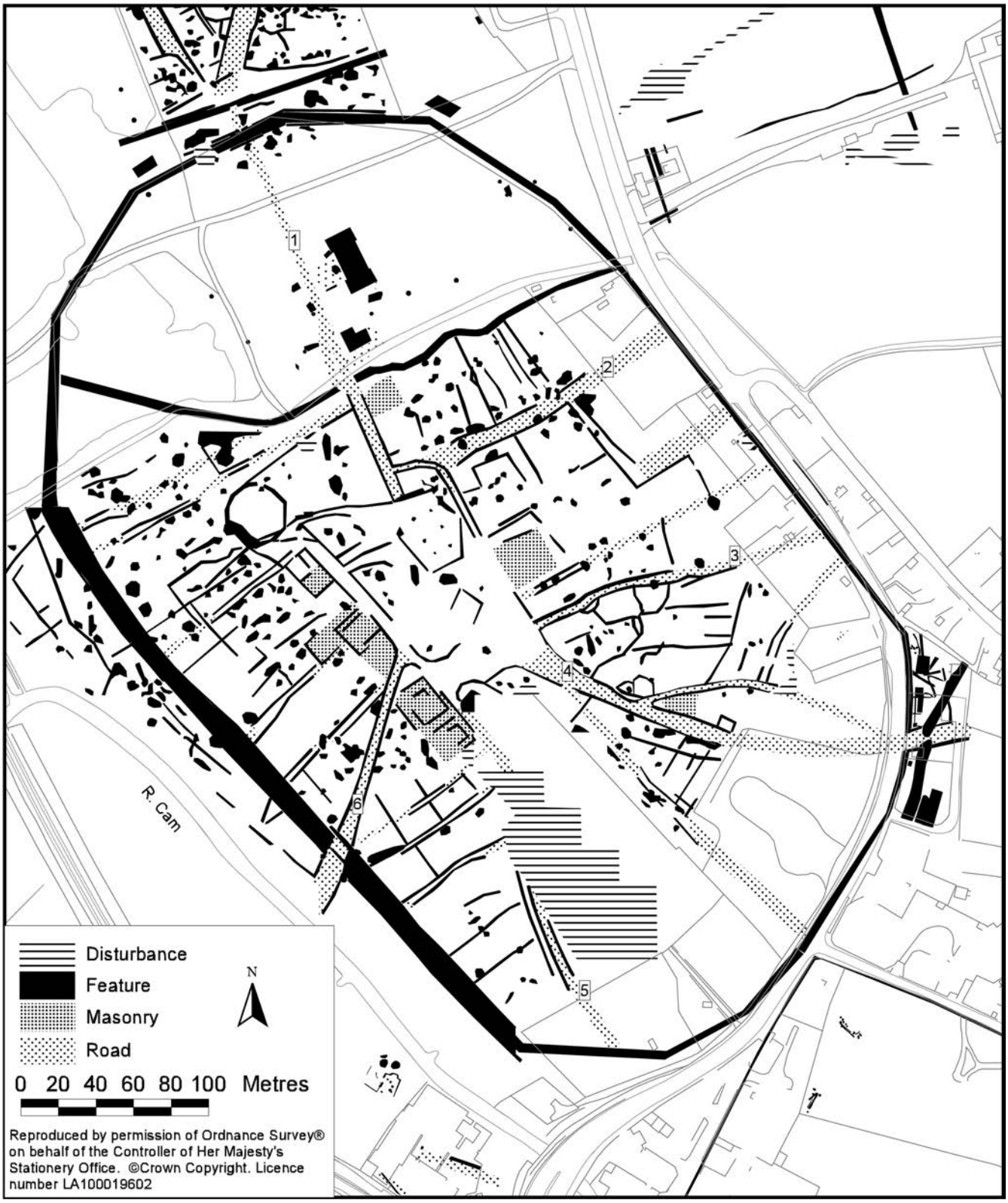


FIGURE 2: Great Chesterford – plan of the town interior incorporating geophysical and excavated evidence

core of the settlement. The *mansio* was repaired after a mid 3rd century fire, and the temple precinct was re-organised in the early 4th century, when a new Romano-Celtic temple was built. A fire in *c.*300 destroyed several buildings in the south of the town. Although most of these were rebuilt, the piecemeal abandonment of building plots in the 4th century implies a gradual decline. It appears that the *mansio* was the *raison d'etre* for the town, as certainly without it Chelmsford would have comprised little more that a linear road-side settlement at the river crossing.

Little substantial work has taken place on Roman Chelmsford in the last ten years that has either significantly added to or modified our understanding of the town. However, trenching on the Clarendon House site (2–6 Parkway) revealed a large ditch that can be equated to the projected line of the Roman town defences (Langton 1996). Trial-trenching at

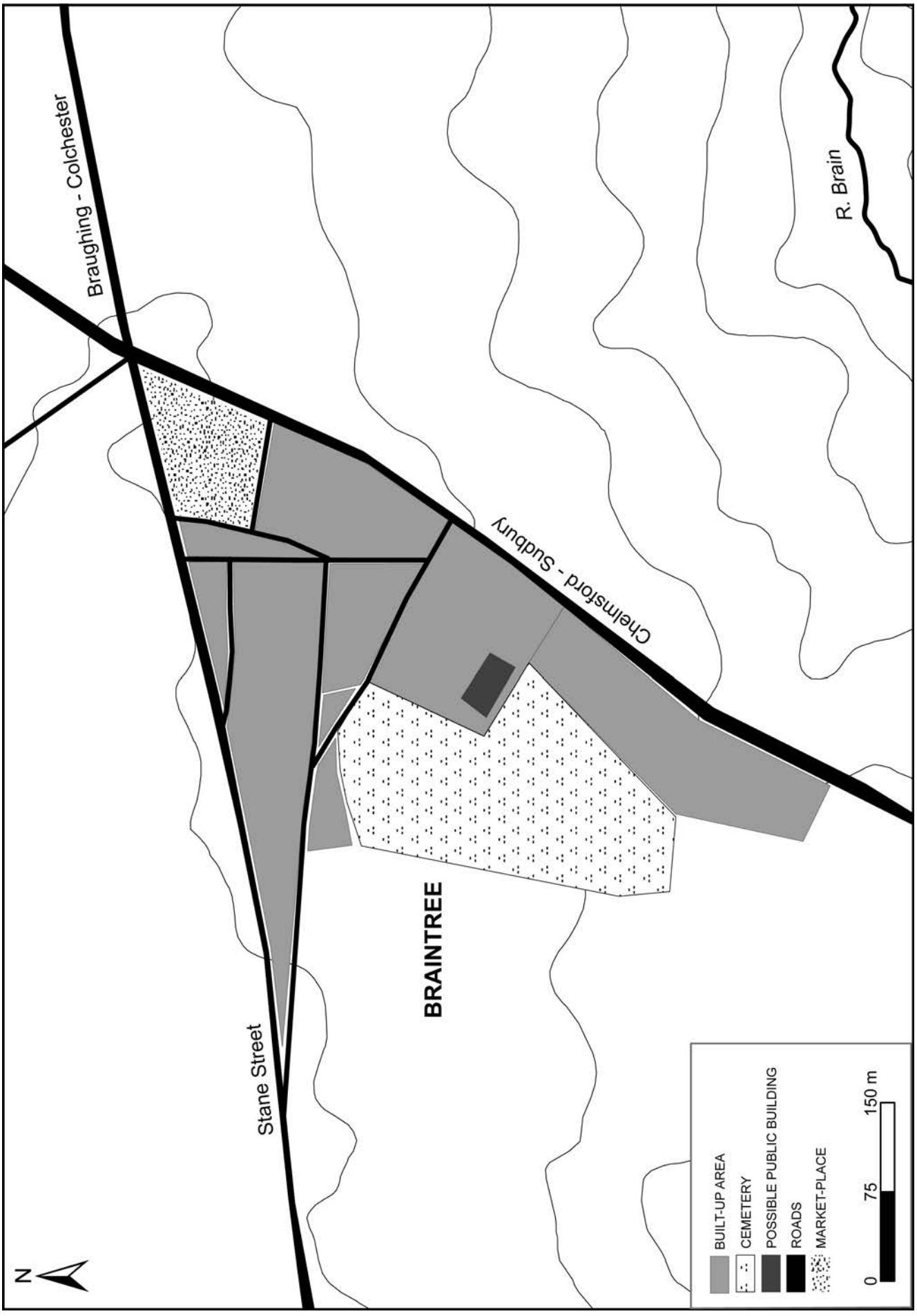


FIGURE 3: Interpretative plan of Roman Braintree

17–18 Grove Road revealed a boundary ditch to the *mansio* complex (Allen 1997). The upper fills of this were dated to the late 4th century and contained quantities of building materials derived from the *mansio*, thus confirming the abandonment and demolition of that building occurred at the very end of the Roman period. Small-scale excavations have extended the spread of extra-mural activity outside the town, to the south along Moulsham Street at least as far as Nos. 145–145A, and to the east along the road to Heybridge to at least as far as the Army and Navy roundabout. This activity has largely taken the form of pits and burials, with some evidence for industry in the form of four tuyères (bellow's nozzles for a furnace) from Lynmouth Gardens (Nicholson and Roberts 2007). Wells and pits dating to the 2nd and 3rd centuries were recently recorded at 31 Mildmay Road (Germany 2009), near the Roman road to Heybridge, sealed by a late 3rd century midden. The 3rd century horn-working industry was also located along the Heybridge Road (Wickenden 1996).

Braintree

The Essex County Council excavations of the 1980s in Braintree town centre were published in 1993 (Havis 1993). However the more significant group of sites excavated by the Brain Valley Archaeological Society (BVAS) and Braintree District Council Manpower Services Scheme still require publication. There has been further excavation in the town centre since 1993, largely limited to the infilling of the backyards of properties on the west side of the High Street. These include a cluster of small-scale excavations at 97–99 (Pearson 2002), 95–103 (Pocock 2006), 103–105 (Hickling 2002) and 109 High Street (Ennis 2003), all contain evidence for dense settlement in the form of beam-slots, pits and post-holes. Excavation at 7 Grenville Road (Garwood 1997) revealed the post-holes of a substantial building, possibly aisled, and more significantly, the building material from a Roman building with architectural pretensions. This latter structure was built of squared timbers, plastered and painted, with a rubble and mortar foundation and tiled roof, and appears to have burnt down. This structure appears to have been considerably more elaborate architecturally than the others that have been excavated to date in Braintree, and it is tentatively suggested that it may have served some form of a public function, rather than being a private dwelling. What is evident from the excavations at Braintree is how concentrated the Roman town appears to have been (Fig. 3). Within the triangle formed by the Stane Street and the Sudbury–Chelmsford road the Roman archaeology is relatively densely packed, with practically every trench (no matter how small) containing structural evidence, or evidence for rubbish disposal, the exception being the putative market-place at the apex of the triangle. However the areas immediately to the north of Stane Street or to the south-east of the Sudbury–Chelmsford road contain virtually no Roman features. It appears that the Roman town did not extend across these roads, and the scarcity of stray Roman finds from the area would suggest that it was not manured using midden material derived from the town. The presumption must be that these areas were either largely under pasture or scrub/woodland. The end of Roman Braintree is intriguing, as on two (unpublished) sites, Saxon sunken-floored buildings appear to have been inserted inside Roman buildings.

Kelvedon

Evidence of Late Iron Age settlement has been found throughout the area of the Roman town at Kelvedon, consisting of individual enclosed house-plots, fields, possibly a temple and some industrial activity. Roman Kelvedon originally comprised a civilian settlement and possibly a short-lived fort (Rodwell, 1988). In the late second century the majority of the built-up area, including a temple and a possible mansio, was enclosed within a defensive ditch, with the cemeteries sited outside. By the end of the Roman period the town was in decline, although there is some evidence for continuation of settlement, not necessarily urban in nature, into the early Saxon period.

Recent trenches have located the north-western town defensive ditch postulated by Rodwell (Ennis and Foreman 2002; Rodwell 1988, Fig. 40). In addition a number of linear features were identified within the enclosed area, which largely lay parallel to the defensive ditch. Excavation to the east of the town enclosure on the Star and Fleece site revealed a trackway, industrial activity in the form of metal-working debris and a Roman quarry pit (Fell and Humphrey 2001).

Great Dunmow

Excavation at Redbond Lodge (Robertson 2005) to the south of the 1972 Chequers Lane site (Wickenden 1988) suggests that the Roman settlement area was neither as dense nor as extensive as previously thought (Fig. 4). The evidence from both Redbond Lodge and Chequers Lane suggest that during the 1st century the area was not inside the built-up settlement, but instead comprised agricultural land, possibly strip fields, just outside the settlement or the rear of smallholdings which fronted onto the road. Although no 1st–century settlement has been identified to date in the town, it seems increasingly likely that it formed ribbon development along the line of Stane Street and along the ridge of high ground. Excavation on the Haslers Lane site some 450m to the south-east (on the edge of the scarp marking the southern edge of the settlement) revealed approximately 110 cremation burials dating to the mid 1st to early 2nd century (Hickling 2003). The types of burial present include urned and unurned cremations, some with ancillary vessels, some boxed or shuttered and some with the bones contained in caskets. Two of the burials were accompanied by mirrors. The 2nd century saw an increase in artefactual material and the first burials in a cremation cemetery in the Redbond Lodge/Chequers Lane area, at or toward the northern side of the settlement. The best settlement evidence dates from the 3rd–4th centuries, with the construction of a possible property boundary and a further increase in artefactual evidence on the Redbond Lodge site, whilst the shrine was built on the Chequers Lane site. Part of a second cremation cemetery (dated to the second century) was excavated in the western half of the town on the Dunmow Junior School site (O'Brien 2005). Fieldwork at the Saracen's Head on the Stortford Road (Germany 1999; Letch 2006) has revealed no trace of the postulated northern boundary to the settlement (Wickenden 1988).

Harlow

Roman Harlow consisted of a temple, which developed from an Iron Age predecessor, with a widespread area of occupation to the north and east. Within this area of occupation there is evidence for both masonry and timber buildings, an internal

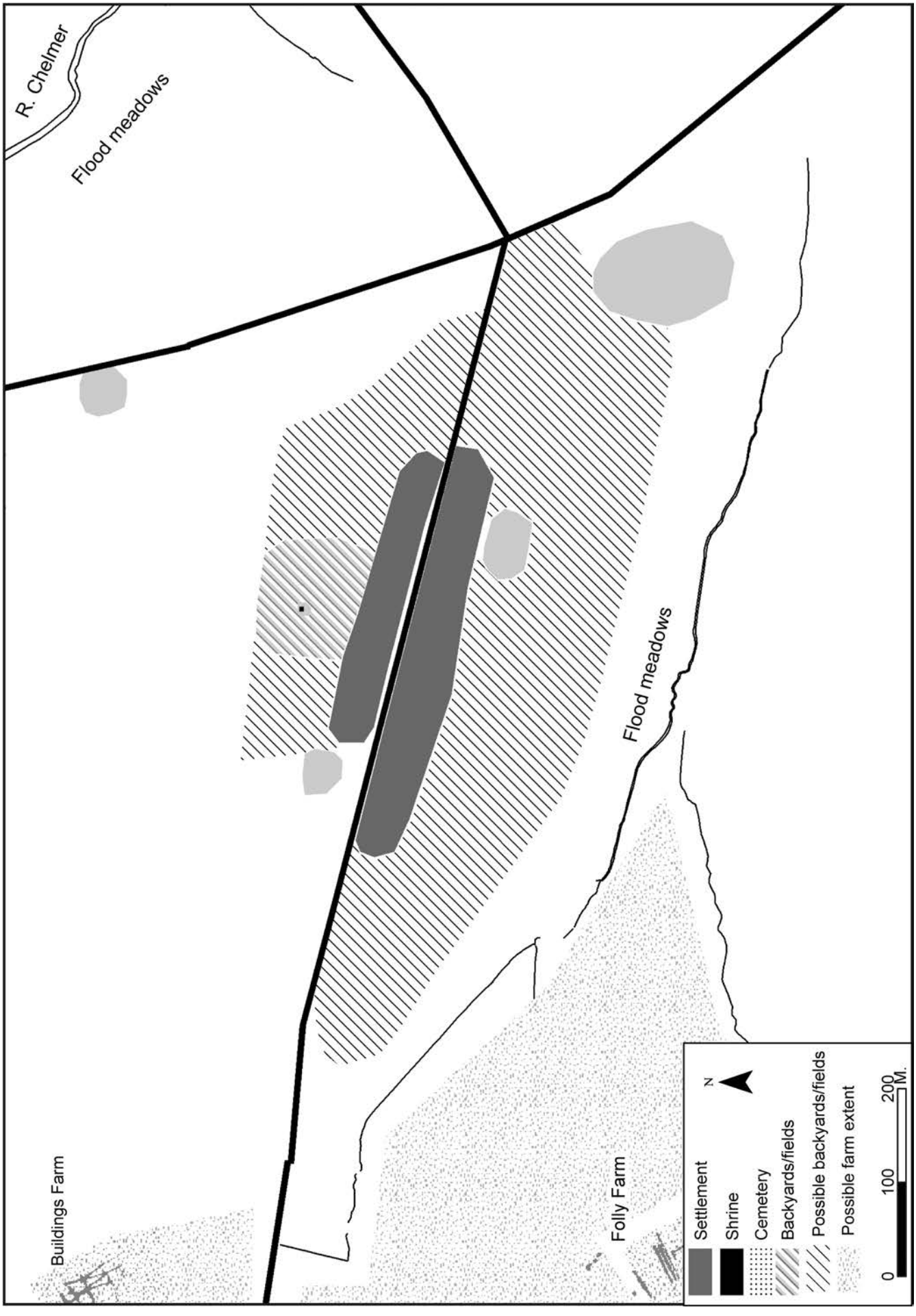


FIGURE 4: Interpretative plan of Roman Great Dunmow

road-pattern and manufacturing areas, as well as a masonry building which has been variously interpreted as a second temple and a public building. The settlement seems to have grown in response to the presence of the temple. What is not clear is whether the settlement was urban in nature, or perhaps something more akin to the settlement excavated at Elms Farm, Heybridge (discussed below).

No new work has taken place on the putative Roman town at Harlow in the last ten years. However, trenching, geophysical survey, fieldwalking and limited excavation nearby has shed some light on its immediate hinterland. Possibly of most significance is the confirmation of the existence of a villa complex some 1.5km to the east of the temple at Gilden Way, Harlowbury (Wardill 1997; Archaeological Services Durham University 2005). A substantial structure, measuring 40 x 40m was identified in the centre of a ditched enclosure, approximately 40m west of the central building is a second building measuring 50m by 10m, possibly a barn or agricultural range. A magnetometer survey of 2.4 hectares of land identified an extensive complex of ditches delineating enclosures, boundaries and other possible structures in the vicinity. To the south-east at Old Hall, Church Langley a small Roman rural settlement was excavated (Medlycott 2000) and there is further evidence for Roman occupation, including structures and field-systems at New Hall (Drake *et al* 2004). It is therefore possible that the Roman settlement at Harlow was

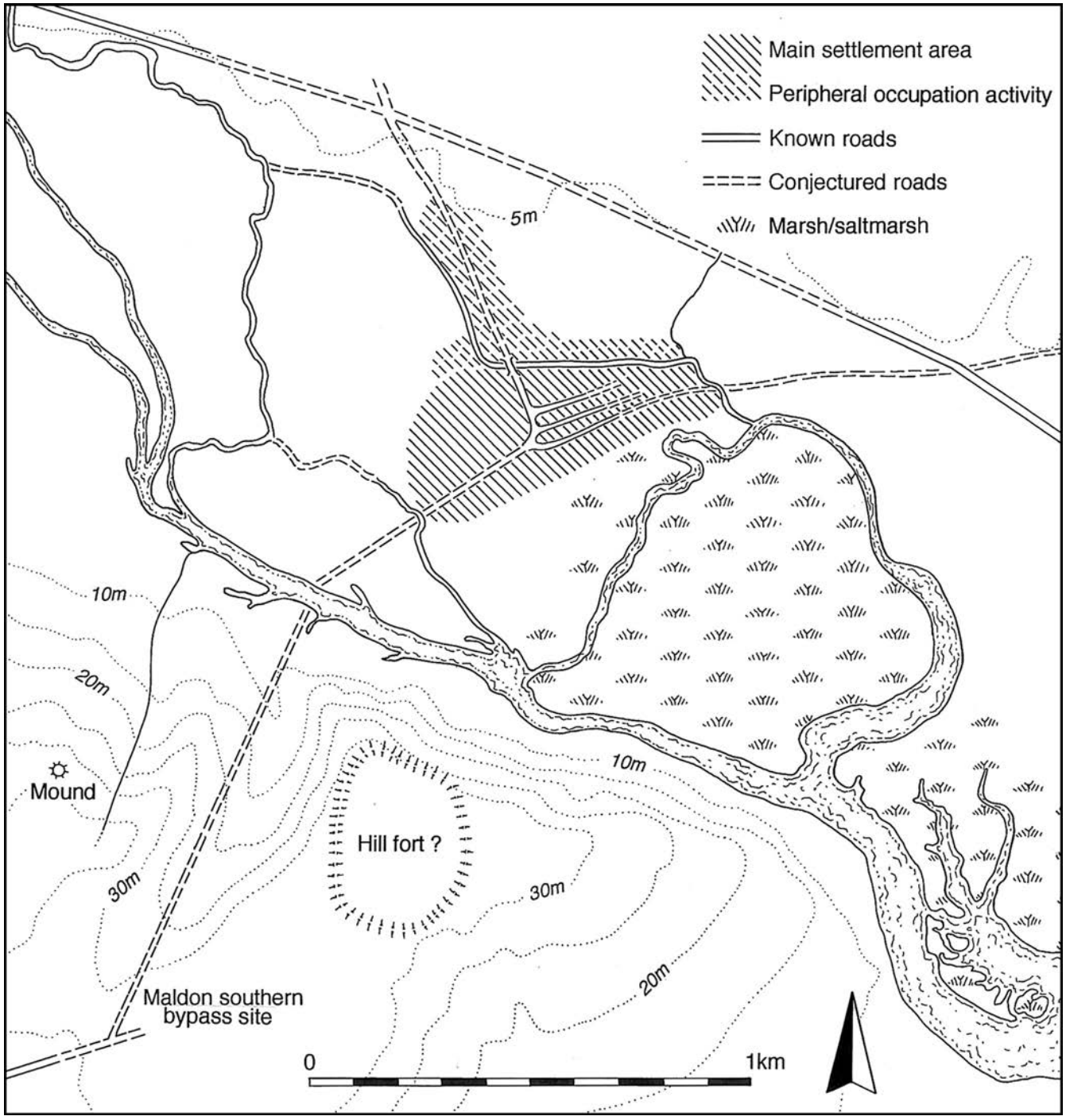


FIGURE 5: Interpretative plan of Elms Farm, Heybridge

significant enough to attract its own satellite settlements such as villas and major farmsteads.

Elms Farm, Heybridge

Knowledge of the Roman settlement at Elms Farm, Heybridge (Fig. 5) has been advanced considerably by the excavations undertaken in 1993–5. Although briefly mentioned by Wickenden in the Writtle Papers (1996, esp. fig.1) post-excavation analysis (Atkinson and Preston forthcoming) has markedly changed our understanding of this settlement, compared both to his 1986 account of Heybridge in *Essex Archaeology & History* (Wickenden 1986) and the *Britannia* interim excavation report (Atkinson & Preston 1998).

Heybridge had its origins in a seemingly dispersed settlement occupying the lower gravel terrace at the head of the Blackwater estuary in the later 1st century BC. Comprising regular enclosures, some of which were occupied by roundhouses and a probable religious focus, the settlement lay between the salt-marshes alongside the River Chelmer and agricultural field systems that occupied the better-drained upper gravel terrace to its north. Judging by the high quantity of continental imports, it was a settlement of some status but evidently not a port, as had previously speculated. Its inhabitants undoubtedly received commodities by river, some perhaps directly from the continent, but Heybridge was primarily a consumer centre – judging by the nature of its rubbish which includes the largest British Dressel 1 wine amphora assemblage to be excavated since World War II. Along with the existence of its religious focus, and a 'pyre-field' located in its immediate hinterland, the settlement population clearly included an elite component. It is speculated that, as a contemporary of Camulodunum, Late Pre-Roman Iron Age Heybridge may have been a local centre of importance – perhaps as a place of religious significance or even the 'home town' of an elite Trinovantian figure (Atkinson and Preston forthcoming). The presence of high status imported commodities such as wine could even be the product of pre-conquest diplomatic contact. The settlement was clearly of sufficient importance to undergo radical remodelling and development at the Conquest and Heybridge is therefore a key site for understanding the LIA/Roman transition period and the process of acculturalisation (so-called 'Romanisation') that occurred.

The transition from the Late Iron Age to the Roman period is characterised by the imposition of an infrastructure of metalled roads and large expanses of gravelled occupation surfaces between them, which served and dominated the settlement layout until the end of the 4th century. Located on a road between Chelmsford and Colchester, Heybridge seems to have been, in essence, a settlement at the crossing of the river Chelmer as much as one at the head of the Blackwater estuary. The Elms Farm excavations, located some 600m from the perceived river crossing at Beeleigh Mill, are therefore regarded as encompassing only the eastern and northern peripheries of an elongated spread of settlement estimated to have been c.20ha in extent. This said, it is becoming increasingly evident that associated settlement and other forms of land-use spreads out around the head of the estuary as evidenced at Heybridge Hall and finds retrieved from recent grave-digging at Heybridge Cemetery.

Returning to the settlement, and within the framework provided by the roads, distinct 'zones' of activity can be discerned in the archaeological record. The central zone is defined by the substantial Roman temple complex, which was created directly on the site of the deliberately cleared Late Iron Age religious focus, and the adjacent expanses of gravelled surfacing that are interpreted as constituting associated public spaces and facilities for visitors to the temple. Either side of this public zone the terrace is divided into largely unsurfaced enclosures. Those to the south comprise strip plots constituting apparent smallholdings fronting onto one of the side roads that head east out of the settlement. Within these enclosures, rectilinear wooden buildings were positioned toward the road frontage, with wells, crop processing structures and oven/hearths in close proximity. To their rear, minor sub-divisions perhaps marking animal pens and cultivation plots are apparent, along with large quantities of rubbish pits – the contents of which attest to a wide range of domestic and craft manufacturing activities. To the north of the central zone, occupation appears interspersed with enclosures and trackways, suggestive of paddocks and infields between the settlement core and the hinterland proper. The hinterland, comprising large fields predominantly for cereal production, was created in the late Iron Age and remained essentially unchanged until the late 2nd century when modifications suggest both diversification and intensification of cereal production.

Clearly functioning as a local centre, perhaps with a market, Heybridge seems to have reached the height of its prosperity in the 1st century AD – perhaps as a result of its early significance and initial embracing of this by the Roman administration. Reducing imported commodities and low levels of maintenance and change are apparent in the 2nd century, with settlement contraction and decline apparent for the 3rd and 4th centuries. Only the temple complex displays continuing dynamic change and use into the 4th century. Progressively, its function and significance as a place of worship and pilgrimage perhaps became Roman Heybridge's sole *raison d'etre*, possibly even finally being converted to a place of Christian worship by the early 5th century.

Early Saxon occupation appears to be located within the remains of the Roman period settlement, comprising a scatter of sunken-floored buildings, re-use of a Roman well and little else. No continuity of occupation can be demonstrated and such presence may be peripheral to more concerted early Saxon settlement shift onto the upper gravel terrace as evidenced by Drury's excavations at Crescent Road (Drury and Wickenden 1982).

Billericay

Recent post-excavation study of the 1970s excavations by the Billericay Archaeological and Historical Society shows that although occupation is spread over *c*. 22 hectares, there is little evidence for any great density of occupation or any degree of internal organisation. (Medlycott *et al.* 2010). It is becoming increasingly clear that the Roman settlement at Billericay should be considered more in the light of a village than a town. Although the archaeological evidence is spread over a large area, there is little evidence for any great density of occupation or for any degree of internal organisation. The settlement appears to have comprised individual house plots or smallholdings, paddocks and small cemetery plots (possibly family-groups), roughly spread out along an

east–west track. Small-scale industrial activity is present in the form of a pottery kiln and a number of corn-driers. The ceramic evidence suggest that the settlement flourished in the Late Iron Age through to the early–mid 2nd century, before entering a period of steady decline, both in the amount of pottery deposited and the quality of the pottery (and by inference other commodities) available. However, the inhabitants of this settlement appeared to have access to a range of goods, both local and imported, throughout the Late Iron Age and Roman periods. Local ceramic products, and those from London, Colchester and north Kent, are the most numerous.

Leaden Roding

A fieldwalking and magnetometer survey (Sharp *et al*. 2008) has identified a village-type settlement located on the London–Great Dunmow Roman road (the B184) at the point where it crosses the River Roding (Fig. 6). The geophysics clearly identifies the main road line leading into a central roughly ovoid open area, probably a market place or green. Radiating out from this central area are possible house-plots, paddocks and fields, covering an extent of about 18 ha. Two further roads or droveways form the northern and southern limits of the central open area, at right-angles to the main road. The droveways appear to have remained unaltered throughout the settlements history. In the northern half of the settlement a rectangular enclosure (85 x 65 m) is visible within the geophysics plot, this has been interpreted by the finder as a possible marching-camp. The finds date this site to the Late Iron Age, Roman and Saxon period; they include coins, roof tile, ceramics and a set of lead weights suggestive of a trading or market function. The settlement is surrounded by one of the highest crop yielding areas in Britain (prior to the drainage of the Fens).

Little London, Chigwell

Frank Clark and the West Essex Archaeological Group published in 1998 (Clark 1998) a synthesis of all the small-scale excavations and documentary work undertaken on the Roman settlement at Little London, Chigwell, including the excavation of the bathhouse, wells, burials and part of the settlement. Although the identification of the settlement as the Roman station of *Durolitum* in the Antonine Itinerary remains unproven, it is evident that some form of substantial settlement was present and further opportunities should be sought to investigate this intriguing site.

Mid-Term Car-Park Site, Stansted Airport

The Mid-term Car-park site (Fig. 6) at Stansted Airport (Cooke *et al* 2008) had a central enclosure area, with the buildings originally located around the outside of it. At a later date the main central enclosure was sub-divided into smaller fields and a number of new structures built along its outer edges. At any one time a minimum of three buildings and a maximum of eight were in use. The building types included rectangular buildings and roundhouses, as well as more irregular structures. Despite the evidence for multiple buildings and indications that a surplus of spelt wheat and beef was produced, there is little evidence for other material wealth in the form of imported ceramics or other luxury goods. It has therefore been suggested that the site represented an agricultural worker's village located within a large agricultural estate that was farmed intensively for profit (Cooke *et al* 2008, 170–8). Some comparisons can be drawn between this site and the possible village site at Leaden Roding (see above); in both cases the site is focused on a central open area, ringed by structures and paddocks, with larger fields radiating out from these. The difference is that the Leaden Roding site is sited astride a major routeway and may have had a small-scale market function.

MILITARY SITES

Some work has taken place on military sites within the county since the last conference. In particular geophysical survey in and around the Saxon Shore Fort of Othona has identified the west wall of the fort, as well as a number of masonry remains, possibly a barrack block, and evidence for an east–west track across the centre of the fort (Wardill 2000). Some 200m to the west of the fort the geophysics revealed a series of small irregular enclosures; these are undated but may represent a civilian *vicus*. Previous excavations some 140m to the north of the fort on the Othona Community Site (Medlycott 1994) had recorded a series of shallow gullies of late Roman date, possibly representing horticultural or agricultural activity.

In Great Chesterford geophysical survey by Wardill (1997b & 1998) has confirmed the point where the north-eastern corner of the Boudiccan-period fort turning southwards, previously located by Rodwell (1972) from the aerial photographic evidence. Trenching has found the eastern side of the fort ditch (Germany 1998).

The distribution of military artefacts in civilian settlements has been highlighted by the recovery of some 62 items from the settlement at Elms Farm, Heybridge, Essex. Analysis of the distribution of 'military' artefacts from Great Chesterford by Hilary Major (in Medlycott 2011) has drawn attention to the fact that the majority do not come from the area of the fort, but are rather more widely distributed throughout the later town and suburbs.

RURAL SETTLEMENTS

Rural settlement in Essex can be broadly sub-divided into four types; villa complexes, complex enclosure groups comprising farmstead, paddocks, fields and droveways, single enclosures and unenclosed settlements, although there are of course overlaps and blurring of the boundaries between these categories (Figs 7 and 8). The cropmark evidence has demonstrated that enclosures, both single and complex, are widespread across most of the county. However, the single examples are usually attributed a late prehistoric date on the basis of comparison with excavated examples (Saunders pers. comm.), although there are known exceptions where the enclosure either continued in use from the Late Iron Age into the Roman period, as at the Skyline Business Park Site (Brooks and Holloway 2006) or formed the focus for a later Roman complex enclosure group, as at BLS, Stansted (Havis and Brooks 2004; Cooke et al 2008).

The EHER records over sixty possible villa sites, the evidence for which ranges from excavation and cropmark evidence to circumstantial evidence such as the reuse of Roman building material in churches which is usually interpreted as indicating the presence of a substantial Roman building in the vicinity. Recent fieldwork on villa sites in Essex includes the large-scale excavations at Great Holts,

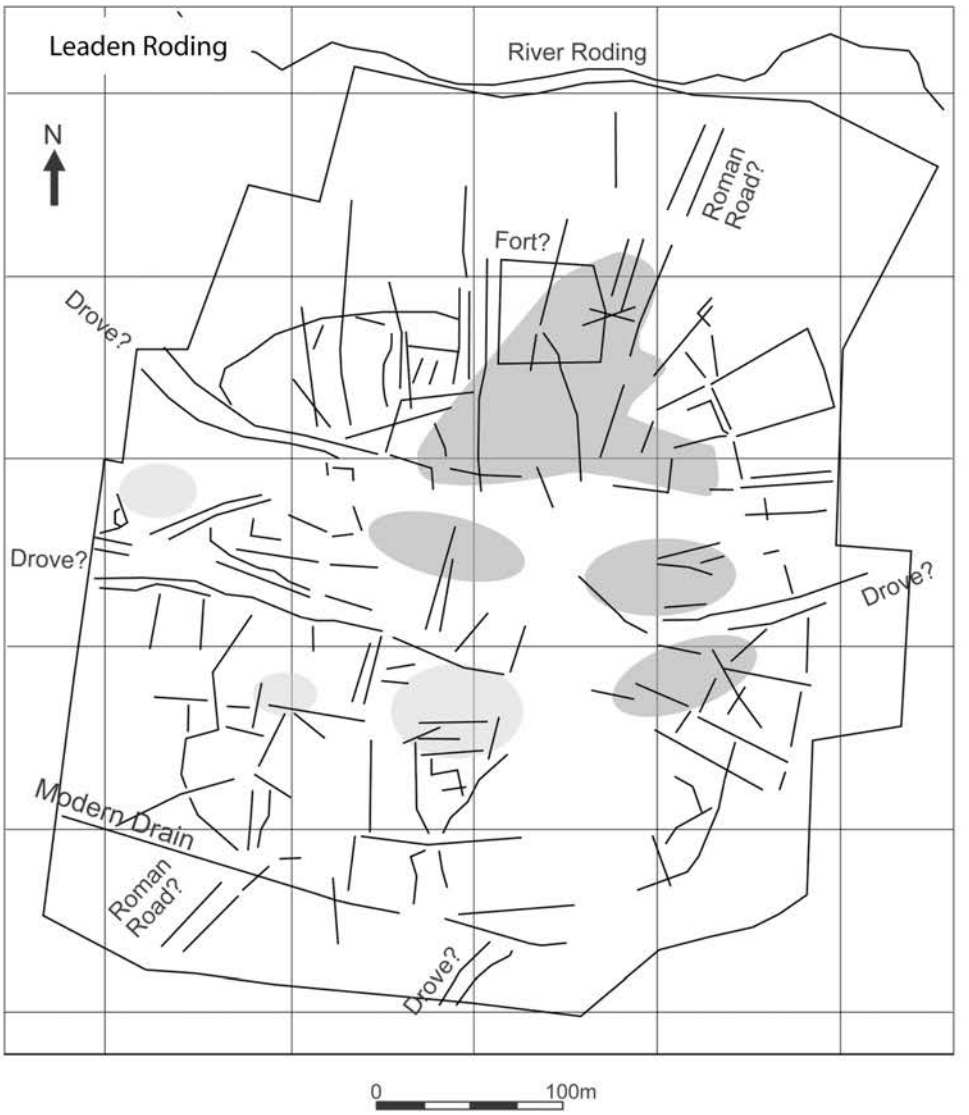
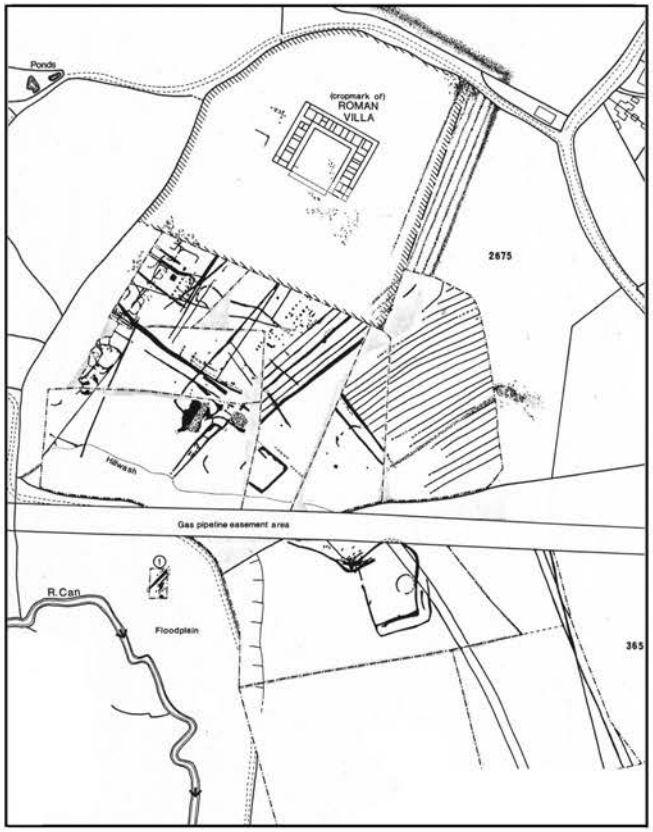
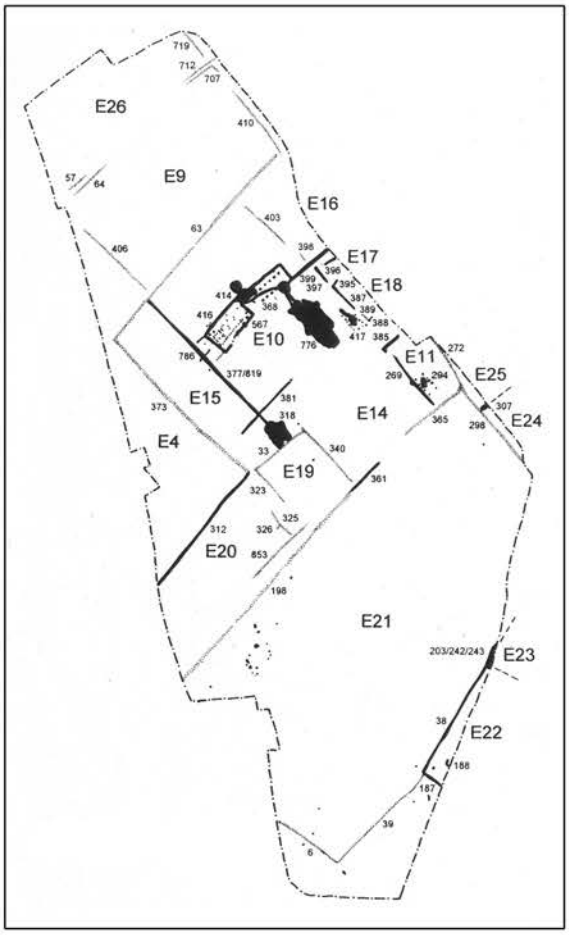


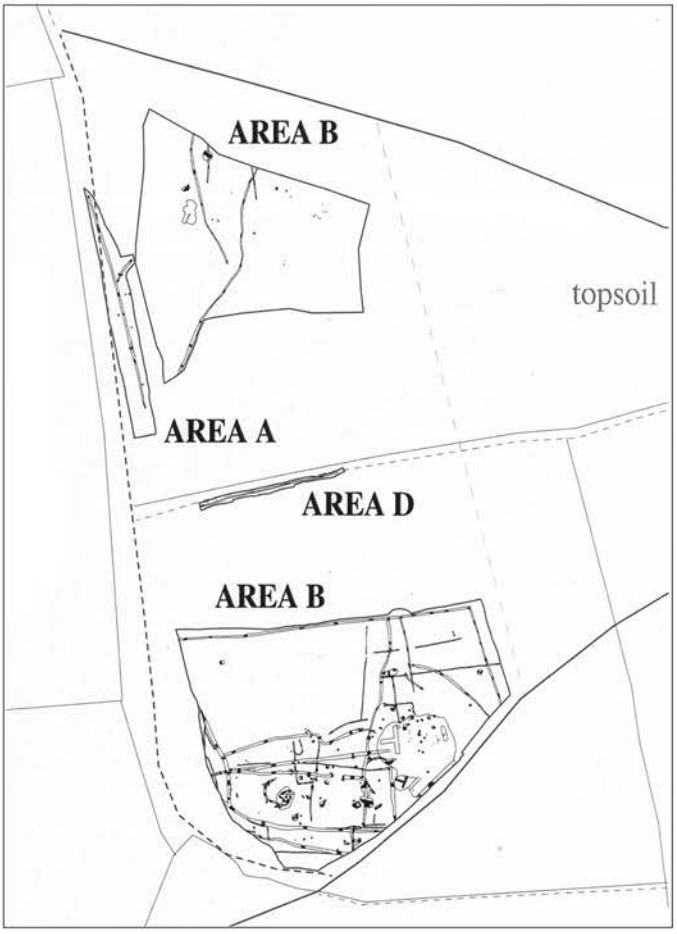
FIGURE 6: Roman villages: Leaden Roding and the Mid-Term Car-Park site, Stansted Airport



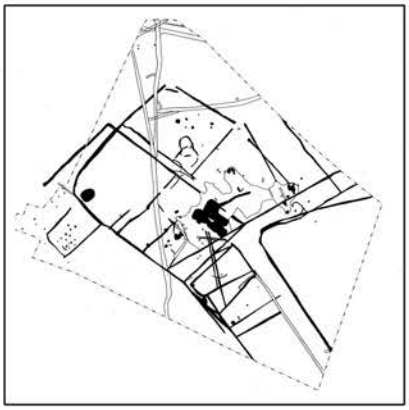
Chignall



Great Holts



Elsenham



Strood Hall

FIGURE 7: Comparative plans of excavated Roman rural sites – Villas and larger farmsteads

Boreham (Germany 2003) and geophysical surveys and trial-trenching at Gilden Way, Harlow (Freke 1997; Wardill 1997; Archaeological Services Durham University 2005; Oxford Archaeology 2006) and trenching at Shillingstone (Garwood 1998). The 1977–81 excavations adjacent to the villa at Chignall have been published (Clarke 1998).

The excavations at Great Holts (Fig. 7) uncovered the main dwelling complex set centrally within a series of yards, paddocks and drove-ways (Germany 2003). The principal building was timber-framed, with straw on its floors, but built in the architectural form of a villa and with an attached tiled and plastered bathhouse. The environmental remains from the well demonstrate that the inhabitants were possibly engaging in hawking, which throughout history has generally been regarded as a high-status activity. It is also evident from the environmental remains (wine and luxury foodstuffs) that they had adopted (or at the very least had aspired to) a socially up-market Romanised diet and lifestyle. The farm associated with the Great Holts villa was almost certainly a productive and innovative business, which included the importation of new cattle breeds (Albarella in Germany 2003) and the production of a grain surplus. This intensification in agriculture may have developed in response to the opportunities provided by the growing urban market and a developing market economy or as a consequence of external stimulation by the Roman administration system.

The site plan of Strood Hall (Fig. 7) at Little Canfield (Timby *et al* 2007) bears a close resemblance to that of Great

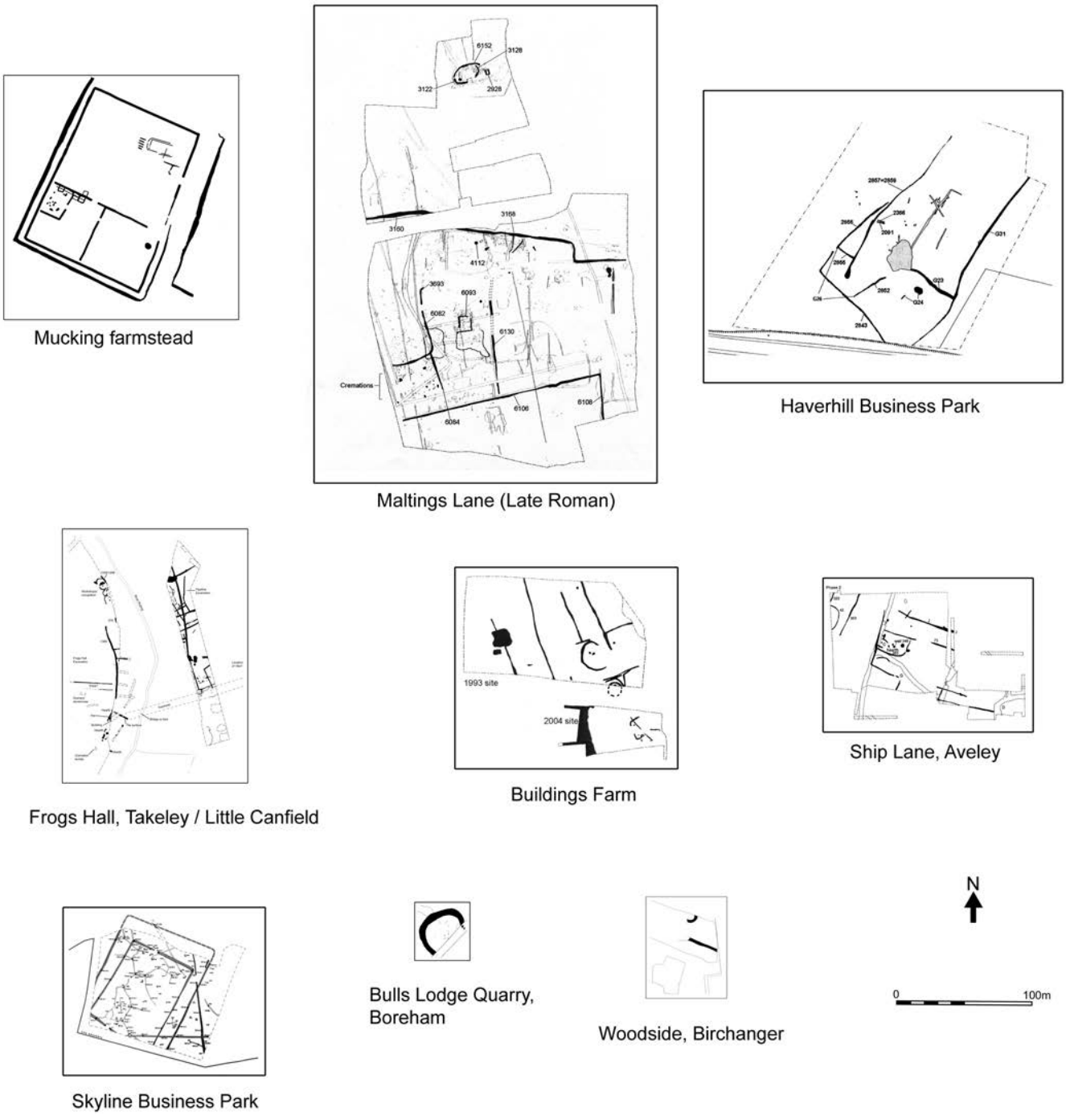


FIGURE 8: Comparative plans of excavated Roman rural sites – medium and smaller farmsteads

Holts, albeit considerably smaller. It too comprises a central ditched enclosure, accessed by a trackway, and encircled by a series of paddocks, fields and linking trackways. The principal dwelling-place, as well as other possible structures, was located within the central compound. On the edge of the main complex was a small ditched compound containing a cemetery with 27 cremations and one inhumation. At Strood Hall and at BLS, Stansted Airport (Cooke *et al* 2008), the evidence for structures comprises areas of cobbling with domestic debris trampled into the surface; these are interpreted as the floors of timber-framed structures, either of a domestic or agricultural nature. The site at Curry Hill on the A130 Bypass (Dale et al 2005) may also have been a variation on the Great Holts/Strood Hall theme, although the full plan of the site was not uncovered.

At Frogs Hall, Takeley/Little Canfield (Fig. 8), a number of agricultural buildings were identified on the periphery of the floodplain of the River Roding (Ennis 2006). The main structure is thought to lie further up the slope where quantities of building material are evident in the ploughsoil. In the excavated area, a rectangular building, defined by gullies and dating to the 2nd or 3rd century, was identified at the edge of a tile surface that may be a continuation of the track leading from the posited villa. This building was located near to two contemporary crop processing structures and may be an associated storehouse or workshop. A second, poorly-dated, post-built rectangular structure, perhaps a granary or storehouse, was located beyond the floodplain on the higher and drier ground to the west. Further buildings of circular design, dating to the late Roman period, were identified to the north. These are interpreted as workshops on the basis that at least one had a central hearth or fire-pit and metal-working debris was found in near-by pits and a ditch. It is possible that the metal-workers lived and worked in the same building, as a number of domestic items were also recovered from this area.

At Maltings Lane, Witham, the site is less regimented in its plan (Robertson and Davies 2004). Here the central ditched compound is irregular in plan; however the principal building (presumably the homestead) is still located centrally within it. Some 110 m to the north was sited a second structure, probably industrial in purpose, perhaps used in crop processing. The site at the Haverhill Business Park (Gardner 2004) is also irregular in plan, comprising a ditched enclosure containing a number of structures, both round and rectangular in plan, it was accessed by a funnel-shaped trackway. The enclosure was subsequently re-dug as a rough rectangle with at least four internal sub-divisions as well a pen for stock-handling.

The Roman period farm at Buildings Farm (Fig. 8), Great Dunmow (Lavender 1997; Germany 2004) comprised two roundhouses and a possible rectangular structure set within an area of strip fields. At Ship Lane, Aveley (Foreman and Maynard 2002), the Late Iron Age/early Roman farmstead comprised a small rectangular enclosure containing two roundhouses and a number of adjoining fields. The site was abandoned or fell into disrepair prior to the later Roman period when the old field system was replaced by a strip-field system, in the corner of one was a small sub-rectangular ditched enclosure containing a structure comprising clay walls on a masonry foundation and a well. On a smaller scale the Skyline Business Park site, Great Notley, comprised a single rectangular enclosure measuring 50 x 65m, originating in the Late Iron Age and expanded in the Early Roman period, with the addition of an outer ditch forming possibly an enclosing trackway (Brooks and Holloway 2006). Similar to this, but even smaller, is the sub-rectangular Late Iron Age/Early Roman enclosure at Bulls Lodge Quarry, Boreham, which was 32m wide and of unknown length (Archer and Clarke 2005). The debris from the ditches suggested domestic occupation although only a few post-holes were recovered from the excavated portion.

Right at the bottom of the scale are the sites that so often make their way into the literature as a 'Roman rural site', comprising a couple of ditches and a pit or two, or as in the case of the Birchanger site, part of a roundhouse and one ditch (Medlycott 1994a). Some of these sites may be part of a larger settlement, but others may indeed represent the bottom of the rural social scale.

Some Roman sites appear to have been abandoned during the 3rd century; however about 70% of investigated sites that existed in the 1st century were still occupied in the 4th century. Going (1996) saw the 4th century as a period of decline, although the distribution of both late 4th century pottery and of coins suggests that many settlements were still occupied into the last decade of the 4th century. However, the late 4th century bronze coins at Elms Farm, Heybridge are almost exclusively limited to the temple area; possibly they had lost their monetary value and become tokens, perhaps solely used for making offerings. Study of 4th century settlements in Essex has demonstrated that 34% of these have also produced small amounts of 5th–7th century pottery (Morris 2005; Morris 2006; Rippon 2008). Interestingly these sites are distributed throughout Essex, rather than concentrated in the areas favoured by characteristically Saxon sites (around the coast and in the Great Chesterford area).

THE WIDER LANDSCAPE

Settlement siting and density

Romano-British settlement, as evidenced by the sites recorded on the EHER, is widespread across the county, although slightly favouring the sands and gravels and the boulder clays over the London Clay. This settlement also favoured the river valleys and valley slopes, but also extended up onto the interfluvial areas. Certainly the evidence from the numerous excavations at Stansted Airport, along the A120 and in the Takeley area suggests that a south-facing gentle slope was the preferred location for settlement (Havis pers. comm.).

Going's study of the landscape around Great Dunmow (in Wickenden 1988) calculated that the villas were spaced at 2–3km intervals along the valley slopes of the Chelmer and its tributary, the Stebbing Brook, as well as on the intervening interfluvial area. Similar analysis of the Brain and Cressing Brook valleys (Hope 2004, 59–61) between Braintree and Witham suggests a distance of between 2 and 2.8km between the villas/larger settlement sites. Again the preference was for the crest of the valley-slope at the junction of the boulder-clay and the river gravels, which also forms the natural spring-line.

Around Great Chesterford, the evidence from the Essex and Cambridgeshire HERs suggest that although the distribution of settlement sites of all sizes was widespread, there was again a clear preference for the river valleys of the Cam and the Granta and their tributaries. By contrast the settlement along the Cambridge–Colchester road and the Icknield Way can only be described as sparse. The exception is the Cam valley route where the river and the road route largely coincide and

the settlement evidence is prolific. Along the Granta valley, the settlements appears to have been spaced at roughly 1.5 km intervals, interspersed by random find-spots and the occasional burial, the latter possibly representing smaller settlements. A similar spacing pattern is evident up the Cam valley, although here the settlements are sited more closely at 1km intervals, and there are more intervening find-spots.

However, in Essex extensive fieldwalking and aerial photographic surveys, coupled with large-scale excavations, have helped shed further light on the extent and density of Roman settlement in the county (Williamson 1986; Medlycott 2005; Ingle and Saunders 2011), in particular bridging the gaps between the larger and more obvious sites. 1,865 hectares have been fieldwalked between 1986 and 2005, using a 20m grid-system (Medlycott 2005) as part of the archaeological development control process. In total 49 sites with evidence of activity in the Roman period have been identified using this method. That is a density of one site for every 38 hectares fieldwalked. These figures cover a wide-range of different soil and landscape types, from the coastal marshes to the boulder-clay plateau. Comparative studies between the fieldwalking results and the excavation results have been undertaken on two large projects, Stansted Airport and the A120 Trunk-road (Medlycott 2005), both in north-west Essex on the boulder-clay plateau. These have established that fieldwalking locates *c*.46% of the Roman sites with below-ground features, representing both settlement sites and field-systems. Therefore a more realistic density of sites, in the boulder-clay plateau area at least, might be considered to be one Roman site for every 15–20 hectares.

In the north-west of the county, to the west of Saffron Walden, a large-scale fieldwalking survey by Williamson (1986), recorded some 35 probable settlements of Roman date, as well as a further twelve minor concentrations of finds. Allowing for other known sites, such as the villa at Wendens Ambo, this suggested a density of one fieldwalked Roman site for every 66 hectares walked. The settlement sites identified were concentrated around the margins of the lighter clay and chalk soils of the valley sides, principally on the edge of the level plateau sides, and to some extent beside the Cam and on the valley-floors of the lower reaches of its tributaries. On the boulder-clay interfluves between the rivers, the settlements are fewer and scattered more evenly, and they were absent from the lighter soils on the valley sides away from the major watercourses. Williamson also observed variations in the size and nature of the settlements which appear to be linked to their siting. The larger sites were located on the margins between the lighter soils and the boulder-clays, with clusters of sites occurring beside the most extensive areas of well-drained soil, as in the area of Catmere End in Littlebury, overlooking the Cam valley. These settlements also tended to produce the finer pottery, rubble, possibly from flint footings, and fragments of building tile. By contrast, the sites on the boulder-clay interfluves were mostly smaller, averaging half a hectare or less in area, had less fine pottery, and practically no building materials.

The new A120 across the southern half of the boulder-clay plateau roughly mirrors the line of Roman Stane Street between Bishops Stortford and Braintree. Its route was both field-walked and excavated, with a total of 23 sites recorded either along the route or closely adjacent to it, including the larger settlements of Great Dunmow and Braintree. Although there was an average distance of 950m between settlements on the 23km long route, the actual distances between sites varied widely from 200m to 2.1km. What is evident, however, is that the widest spacing related to those sites that were identified as being of higher status, such as between Boxted Wood villa and malting site and the villa/farmstead at Rayne Roundabout (Timby et al 2007). It is presumed that the size of the land-holdings or farms is reflected in the relative spacing, thus the highest status settlement sites exploit the largest areas (Fig. 9).

The issue of identifying the extent of farm 'estates', where the estate may have incorporated several earlier farms, is more complicated. It is possible that the holding encompassed several settlement sites, in which case the extent of the estate could not be established by the distribution of sites. However where earlier farmsteads were consolidated into a single workers 'village' as is postulated for the Mid-Term Car-Park site at Stansted Airport (Cooke *et al* 2008), the estate extent could be estimated on the basis of distance to its nearest neighbour.

Field-systems

A number of different forms of Roman field-systems have been identified, both by excavation and by aerial photography. The complex enclosure settlements, comprise a central square or rectangular settlement area, accessed by a trackway and flanked by fields and paddocks, also rectangular or square in plan and linked by tracks or droveways (Fig. 10). These fields vary in size, but are usually of paddock or pightle size close to the settlement area, becoming larger as they get further away. It can perhaps be presumed that the smaller and closer fields were used for horticulture, orchards and perhaps vineyards (grape pollen has been recovered from Elms Farm (Atkinson and Preston forthcoming), and the intensive management of particular groups of livestock such as draught oxen or horses. Analysis of the aerial photographic evidence (Ingle and Saunders 2011) has demonstrated that this form of settlement is widespread, with the possible exception of the north-westernmost corner of the county. Here, although the chalk is conducive to cropmark formation, and many simple enclosures are visible, the complex enclosure type is much rarer, possibly due to the local topography of chalk ridges, as the form reappears on the Cambridgeshire clays to the north. This form of infield/outfield system is evident also in the fieldwalking results from north-west Essex (Williamson 1986), where the distribution of stray sherds, comprising a denser concentration in the vicinity of settlements, thinning out to a general 'background' level, was interpreted as representing a system of infield and outfield land-management, with manuring being concentrated on the infields adjacent to the farmstead. This pattern is also evident in the results of the M11 fieldwalking adjacent to Wendens Ambo villa (Atkinson 1993).

A variation of the complex enclosure system is also apparent in the cropmark evidence, particularly on the gravels, these comprise extensive trackway systems with fields and enclosures set along each side of the track (Fig. 11). At Ardleigh the trackway may have had its origins in the Bronze Age, and some of the enclosures may well be Iron Age in origin (Brown 1999; Ingle and Saunders 2011), but both have been incorporated into a large-scale Roman field-system covering some 166 ha. Similar systems are visible at Chigborough in

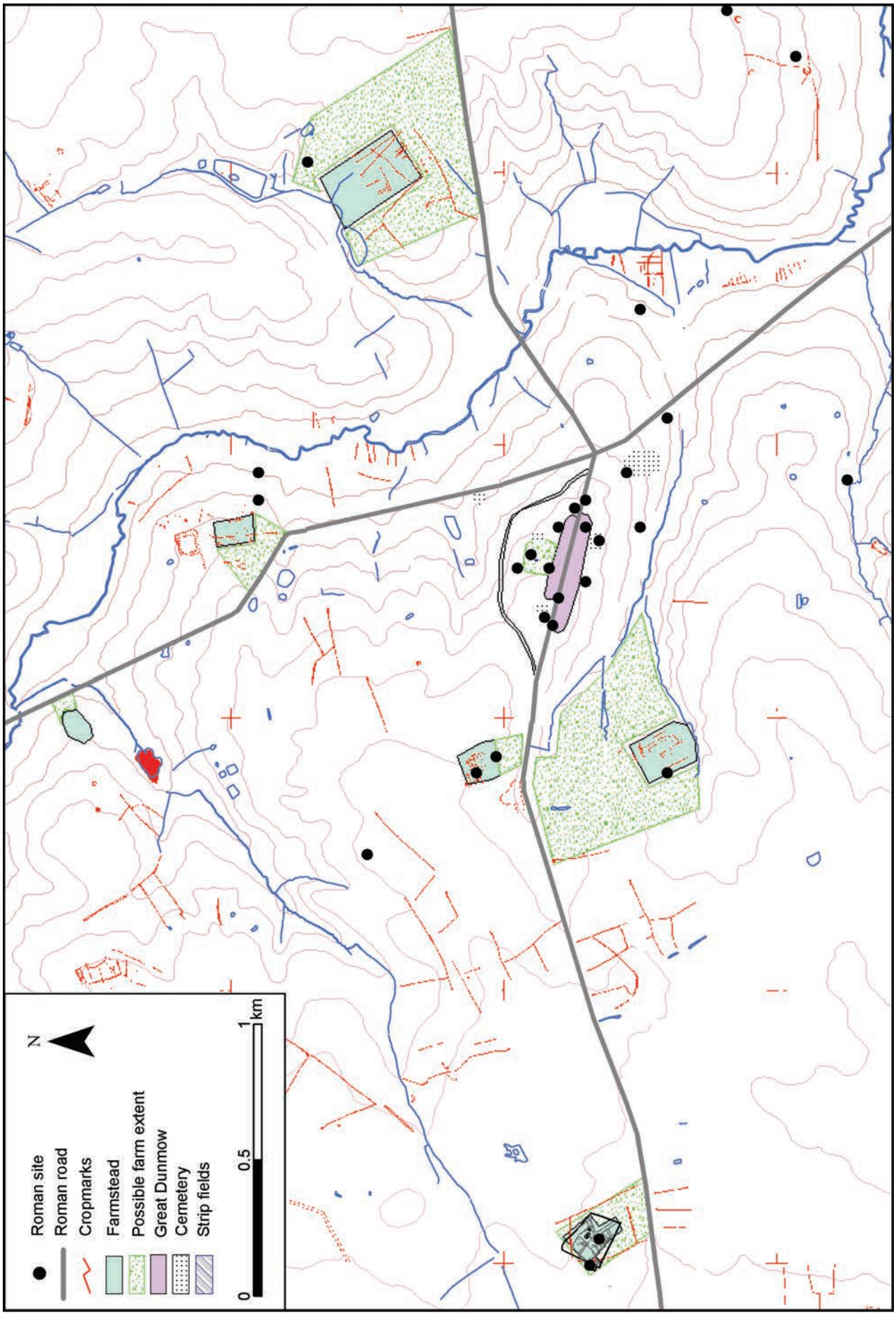


FIGURE 9: The Roman landscape around Great Dunmow – a speculative study

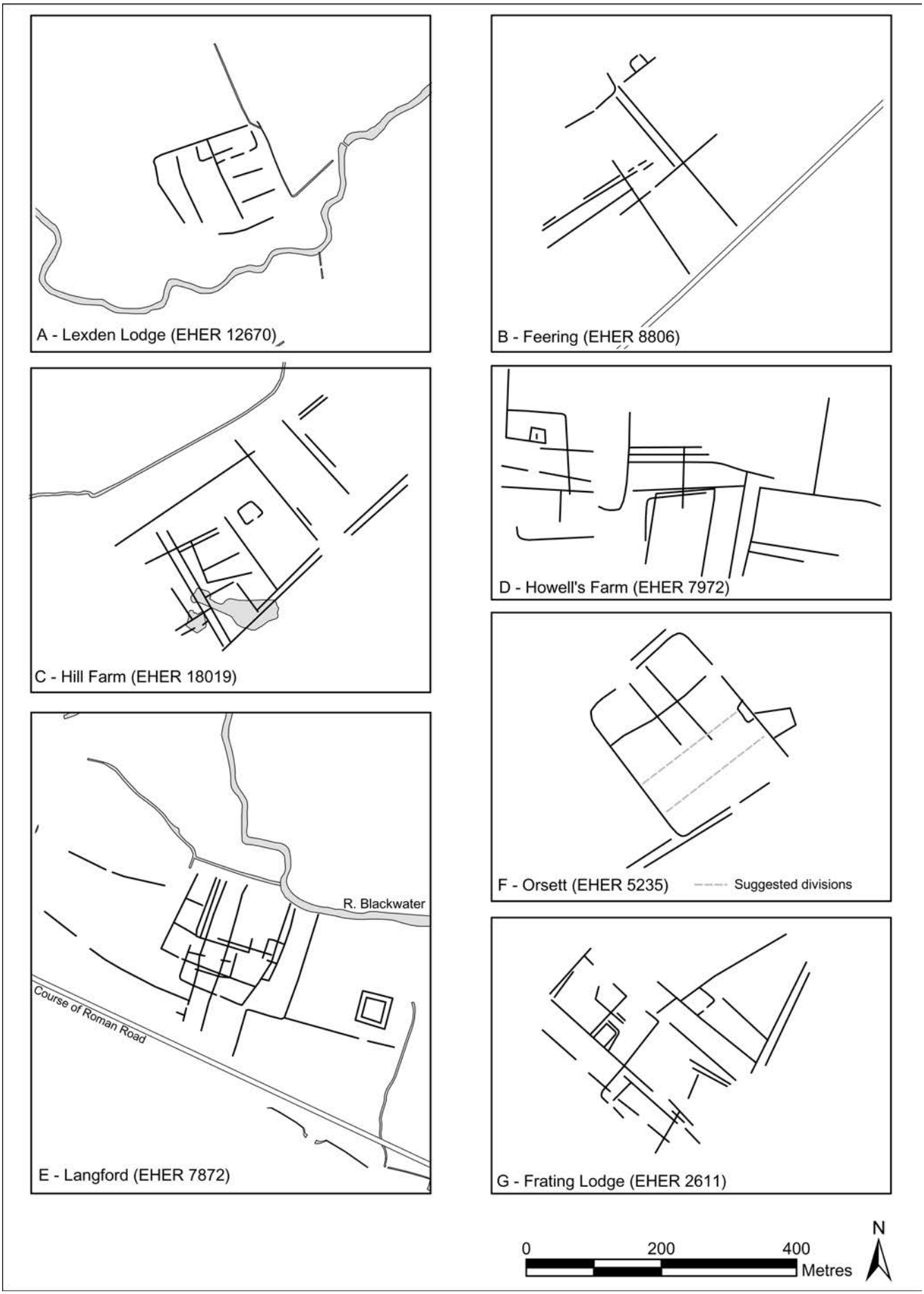
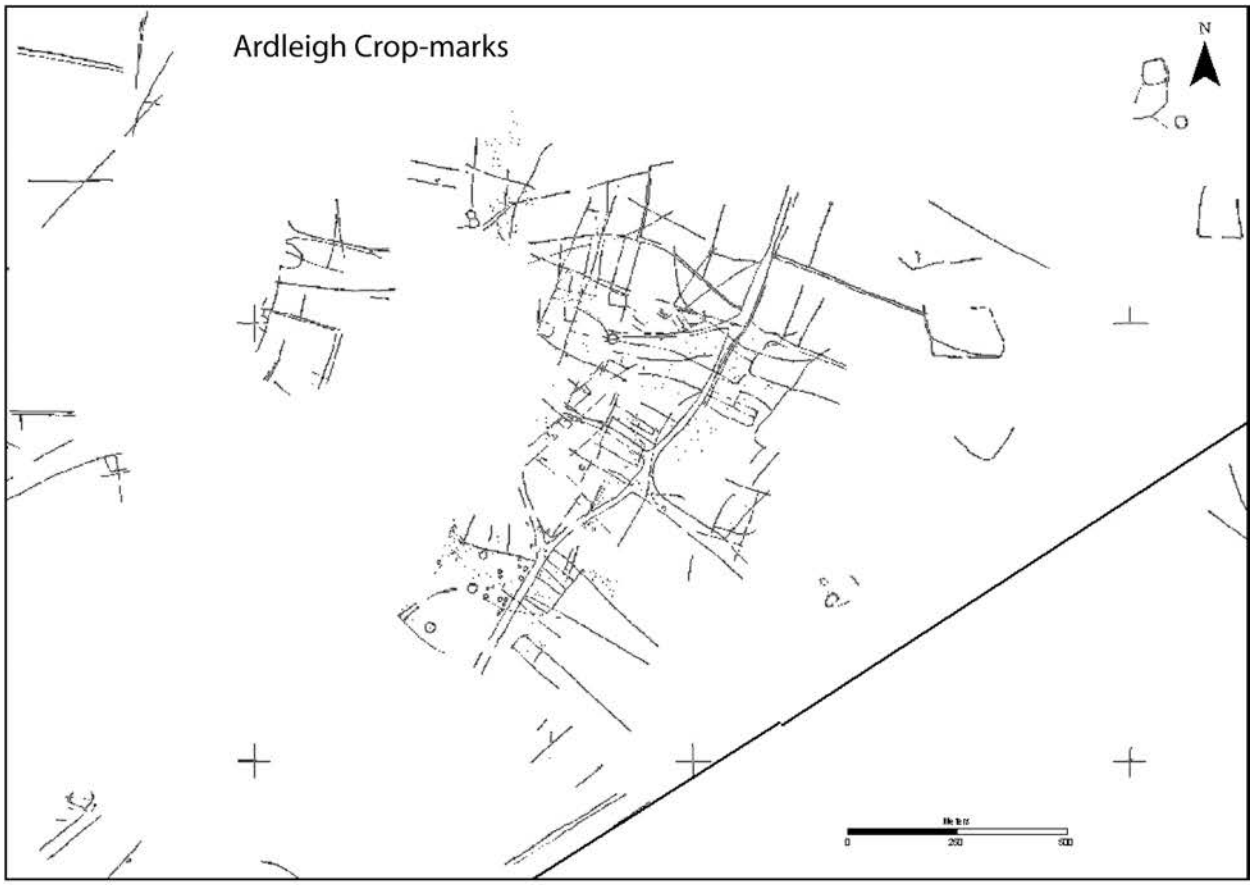


FIGURE 10: Cropmarks of complex enclosure settlements (from Ingle and Saunders 2011)



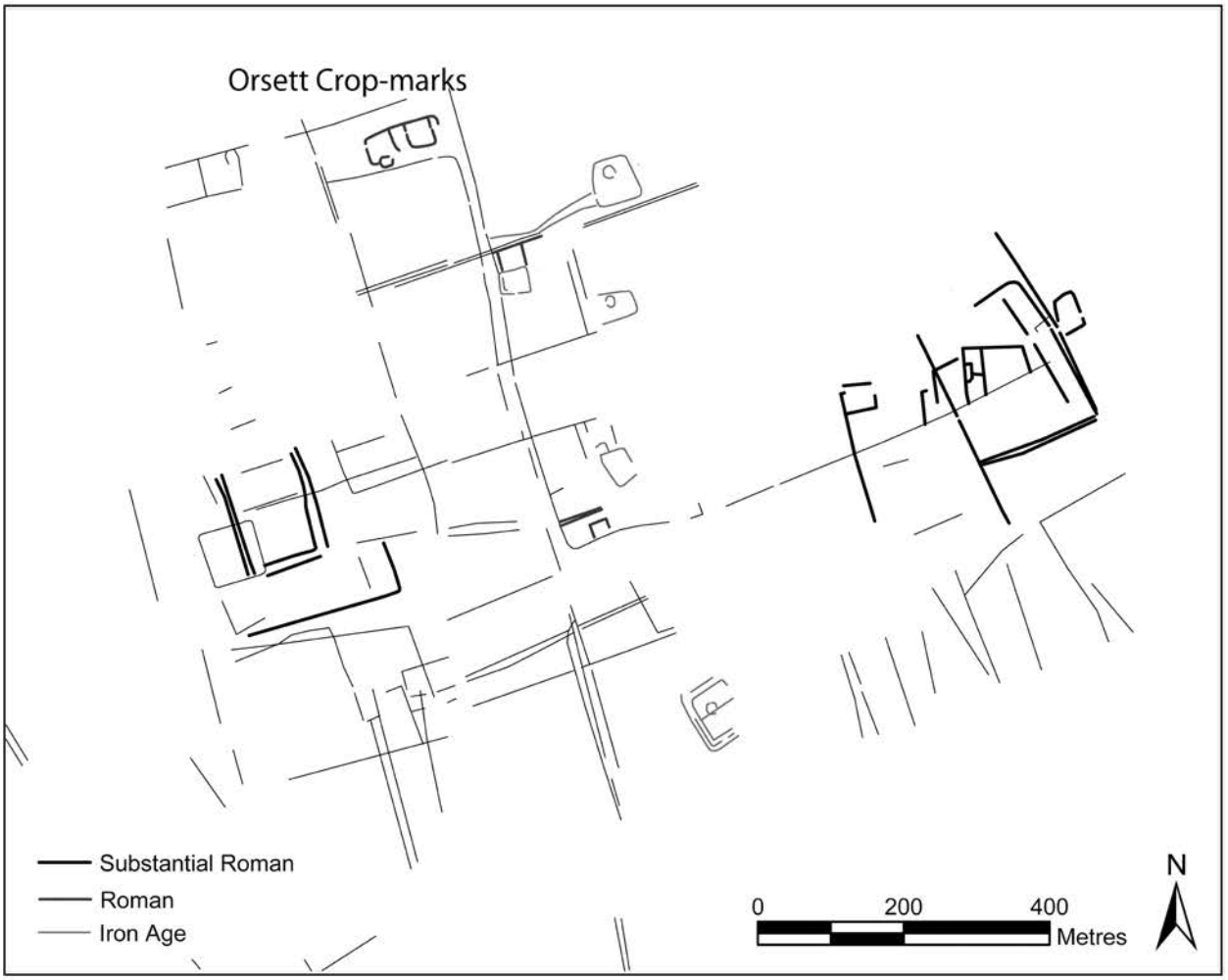


FIGURE 11: Cropmarks of Roman hamlets and field-systems at Ardleigh and Orsett.

the Blackwater Valley (Wallis and Waughman 1998), Orsett (Ingle and Saunders 2011) and Mucking (Clark 1993; Ingle and Saunders 2011)

The issue of field and farm size has received some consideration over the years. Germany has established that the fields at Great Holts were laid out at right-angles and in multiples of either 144 or 180 *pes monetalis* (pM) or Roman feet (Germany 2003, 20), enclosing fields of 4.5 or 9 *actus* in area (approx. 0.5 and 1 ha.). Helen Saunders (Saunders and Ingle 2011) has undertaken a similar measurement programme on a number of cropmark sites that bear comparison to the Great Holts site (Langford EHER 7872, Lexden Lodge EHER 12670 and Hill Farm, Tendring EHER 18019) revealing similar evidence for a degree of pre-planning in their layout, both in the consistent use of right-angles and of multiples of fixed measurements. It is not possible to say whether this is a sign of local administrative control and/or 'Roman' ownership; what is clear however is that Roman measurements and possibly survey-methodologies were widely adopted by the land-owning classes of rural Essex.

A notable phenomenon of many of the farms found along the old A120 (formerly Stane Street) is that the settlement area is set back from the main road (Fig. 8). 96m of the track which linked Strood Hall, Dunmow to Stane Street were investigated and planned, out of an estimated 230m length. The tracks to the villas at Marks Hill, Great Dunmow and Boxted Wood may have been up to 300m in length, and the crop-mark complex at Folly Farm, Dunmow is 450m from the main road. The smaller settlement at Buildings Farm (Lavender 1997; Germany 2004) was approximately 100m back from the road. The implication is that the road was not the primary factor for the location of the homestead (and that these were not economically dependent on chance passing trade), and it can be postulated that the homesteads were located close to the centre of the farm (a placement tradition that can be observed with many of the older medieval farms along the road).

The basic subsistence level for a Roman farm was about 7 *iugera* (about 1.7 ha.), however a more viable farm, producing a small surplus, would have comprised approximately 24–30 *iugera* (6–7.5 ha.). The Roman agricultural authorities considered a small farm to be 18–88 *iugera*, a medium-sized farm to be 80–500 *iugera* and a large farm to exceed 500 *iugera* (White 1970). It is possible using the cropmark and excavated evidence to establish the area of some of the complex enclosure sites (Table 1), ranging from the subsistence-level farm at Buildings Farm to the larger complexes of Great Holts and Mid-term Car-park, Stansted. When the potential extent of a farm is calculated, based on possible limits set by a main road or watercourse or proximity to its neighbours, it is evident that the farms must have varied considerably in size, from 4 hectares at Buildings Farm, Dunmow to 46 hectares at Great Holts, Boreham, and it is of course possible that some of these were much larger.

It is not usually possible to say what individual fields were used for, and of course the function of any field could change either seasonally or over the life-time of the farm. However at Chigborough the rectangular field-system with its associated wells and water-holes has been interpreted as stock enclosures, the wells suggesting they were intended for either cattle or horses, both of which require large amounts of water (Wallis and Waughman 1998). The low-lying ground to the west of the enclosures would have provided rich summer pasture, with the enclosed areas serving either for winter pasturing or for more seasonal activities such as milking or weaning. Similarly the triangular or funnel-shaped enclosures at the Haverhill Business Park site (Gardener 2004) are best interpreted as being used for stock management in a similar manner to the modern cattle-crush. The smaller paddock-sized fields associated with the complex enclosure groups would again best lend themselves to stock management (such as housing the bull or a mare and foal) or to horticultural activities. Equally the incidence of crop-processing structures (corn-driers) within field systems at Heybridge (Atkinson and Preston forthcoming) and Frogs Hall, Takeley (Ennis 2006) would indicate the growing and processing of cereal crops.

At North Shoebury (Brown and Wymer 1995) the arrangement of north–south ditches appears to continue and extend the pattern of land divisions established in the Late Iron Age. The strip-like pattern is similar to those which sub-divide a large rectilinear enclosure at Coggeshall (Clarke 1988; Isserlin 1995) and at Buildings Farm, Great Dunmow (Lavender 1997; Germany 2004). In the medieval period strip-fields are particularly associated with arable cultivation, and it is likely that this was also the case in the Roman period.

It appears that many of the late prehistoric and Roman field-systems were relatively short-lived, being maintained for a few centuries, before being abandoned and replaced by a new enclosure system, sometimes on a different orientation. Examples of field-systems that underwent sporadic re-modelling include Buildings Farm outside Great Dunmow

Site	Excavated/cropmark area	Potential area based on proximity to landmarks and neighbouring sites (roads/rivers)
Buildings Farm, Dunmow	2 ha. (8 iugera)	4.1 ha. (16 iugera)
Strood Hall, Dunmow	3 ha. (12 iugera)	5.5 ha. (22 iugera)
Folly Farm, Dunmow	4 ha. (15 iugera)	13 ha. (51 iugera)
Marks Hill, Dunmow	7 ha. (28 iugera)	13 ha. (51 iugera)
BLS, Stansted	7.6 ha. (30 iugera)	32 ha. (127 iugera)
Great Holts, Boreham	8 ha. (32 iugera)	46 ha. (182 iugera)
Mid-Term Car-Park, Stansted	20 ha. (79 iugera)	52 ha. (206 iugera)

TABLE 1: Possible farm extents

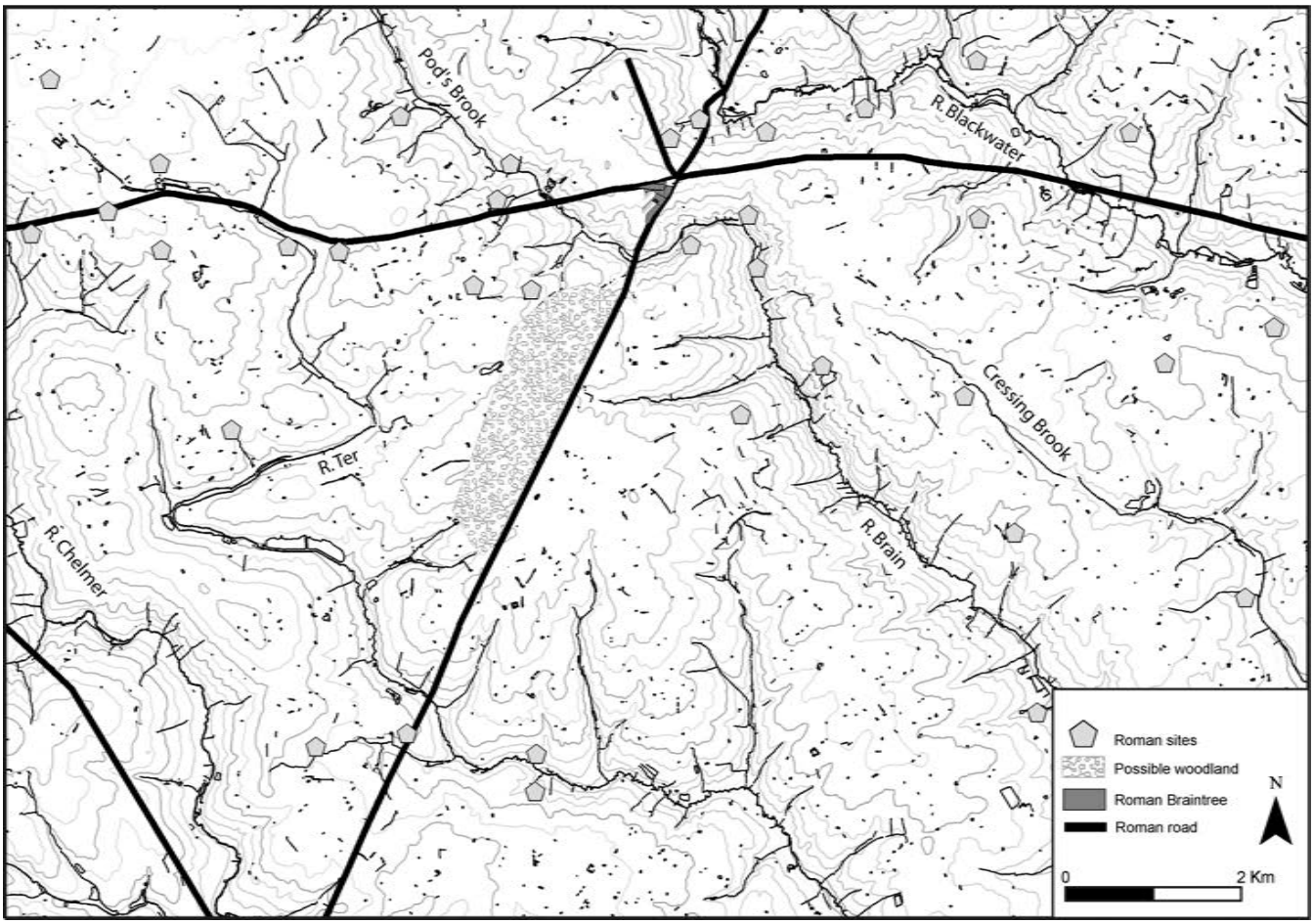


FIGURE 12: Speculative plan of the Roman landscape and woodland to the south of Braintree

(Lavender 1997; Germany 2004), Chigborough (Wallis and Waughman 1998, 76–98), Curry Hill and Downhouse Farm on the A130 (Dale *et al* 2005), Mid-term Car-park, Stansted (Cooke *et al* 2008) and the New Source Works in Castle Hedingham (Lavender 1996). In addition there appears to have been a period of change in agricultural practice in the mid-Roman period, which in some areas included the replacement of small fields with larger enclosures. This may have been due to the emergence of larger agricultural estates or a change in the crops or animals reared. An example of such a change is at the Monument Borrow Pit site on the A130 By-pass (Dale *et al* 2005), where in the Late Iron Age/Early Roman period the landscape was laid out with a series of enclosures flanking a trackway. In the mid–late Roman period the trackway was narrowed and the remainder of the enclosures apparently abandoned, leaving the impression that the trackway was the sole divider of an otherwise open landscape.

Large-scale excavations and fieldwalking at Stansted and along the A120 and A130 road-schemes have also established that there was not a continuous fieldscape across the county in the Roman period (Cooke *et al* 2008; Timby *et al* 2007; Dale *et al* 2005). The issue as to what was in these apparently empty spaces has not been resolved. At Great Holts, Boreham, the extensive mid-Roman field-system, was delimited by a ditch marking the apparent southern boundary, marking an area of possible open pasture (Germany 2003). The well timbers from Great Holts appear to come from managed woodland, and it is possible that some of the apparently open land was managed woodland. The timbers of the lined well at Elms Farm, Heybridge show that there was a scarcity of large, slow-grown oaks by mid 2nd cent (Atkinson and Preston in prep). The open areas on the northern and southern sides of the main roads that form the boundaries of Roman town at Braintree may also have been used as open pasturage, as there is no evidence for either settlement or the manuring of arable land using the town middens in those areas. Possible areas of woodland can be postulated for the area to the south of Braintree, along the Roman road from Chelmsford (Fig. 12). Here, despite extensive archaeological fieldwork in the form of trenching and fieldwalking along the Great Leighs By-pass and on the site of the Great Notley Garden Village, there is little to no evidence for Roman occupation. Instead the occupation lies to the north close to Stane Street or to the south strung out along the valley of the River Ter.

THE FARMING ECONOMY

The faunal remains suggest an increasing importance of cattle, at the expense of sheep, through the Roman period, as demonstrated by the food remains from the towns of Colchester, Chelmsford, Great Dunmow and Kelvedon and on rural sites such as the villa at Wendons Ambo. It has been suggested that this trend may be a consequence of the increase in arable production, with its need for traction animals and a source of manure. This ties in with what is known about the wider Roman landscape of East Anglia (Murphy 1997). The process of progressive permanent woodland clearance that

had been ongoing since the Bronze Age continued into the Roman period. Pollen assemblages from the Mar Dyke and Slough House Farm in Essex suggest that tree and shrub pollen averaged only 10–12% of the total. The East Anglian landscapes were agriculturally productive, with the arable assemblage dominated by spelt wheat. Other crops included six-row barley and emmer, with smaller amounts of horse-bean, pea, oats, rye and flax/linseed. There is also some evidence for vine and hemp cultivation in the region (Murphy 1997). Within Essex a number of regional variations can be observed.

The chalk in the north-west of the county

Our understanding of the Iron Age and Roman economy and environment for the north-western limits of the county is dependent on data from the temple at Great Chesterford (Medlycott 2011) and a number of sites excavated just over the border in Cambridgeshire at Borough Hill, Sawston (Mortimer 2001; Samuels 2001), Hinxton Quarry (Mortimer and Evans 1996), Granta Park, Great Abington (Baxter 1999) and Wandlebury Ringwork (French 1998). The evidence from these sites is broadly consistent in their depiction of the Late Iron Age and Roman landscape of the chalk ridges of north-west Essex and south Cambridgeshire. The Iron Age landscape comprised an open dry environment dominated by calcareous grassland. Spelt wheat and some emmer wheat were cultivated, together with barley. There is some evidence for the sowing of winter wheat and for meadows. There was woodland, some at least with tall mature trees that formed the nesting place of the white-tailed eagle. In the flood plains of the Rivers Cam and Granta were marshy areas, prone to seasonal flooding.

In the Roman period, the agricultural landscape remained largely unchanged, being dominated by open grassland. Wheat and barley were still the principal arable crops grown and in the later Roman period free-threshing wheat was added to this group. There is some evidence for the deliberate management of hay meadows, probably sited along the river banks. The garden snail, a Roman introduction, also makes its first appearance in the molluscan record. Elderberry, blackberry and various nuts were all consumed and may have been cultivated. There was woodland in the area, which included oak, birch, hazel and poplar. Cattle, sheep/goats, pigs, horse, dogs, cats and chicken are represented in the faunal record, with cattle predominating, followed by sheep/goats. Where it is possible to identify species, the sheep/goats are sheep, of a long-tailed variety. There is evidence for selective breeding and general stock improvement in the Great Chesterford sheep flock in the late 1st–late 2nd century, and this coupled with the evidence for damage caused by penning, suggests an active stock management regime was in place.

The boulder-clay plateau

The Stansted Airport (Cooke *et al* 2008) and A120 (Timby *et al* 2007) excavations, together with numerous smaller interventions, have shed considerable new light on the agricultural landscape and economy of the boulder-clay plateau. In the early and mid-Roman period the evidence all points towards a mixed farming regime. Cattle bone dominates the faunal assemblages with smaller quantities of sheep/goat and pig. In addition horse, cat and dog bones were recovered, as well as those of wild animals and fowl. The evidence for cereal production suggests that the heavy boulder-clays as well as the lighter soils of the river valleys which dissect the boulder-clay plateau were being cultivated. Both emmer and spelt wheat was being grown, with spelt clearly the most common. The preliminary processing of the crop seems to have taken place apart from the main areas of settlement, with final processing occurring within the settlements themselves (e.g. Frogs Hall). However, high levels of grass pollen suggest that the majority of the land was under pasture. Tree pollen is relatively rare suggesting that the areas surrounding the excavations were not heavily wooded, however hedgerow species are recorded. In the later Roman period the pattern of mixed agriculture continued, although with more evidence for specialisation. On the Long-Term Car-Park/Bury Lodge sites at Stansted it appears that the immediate environs of the site was given over to pasture and meadows, with occasional areas of rougher ground. Cattle, sheep/goat and pig remained important here, although cereals, in particular barley, were grown nearby. Both the Duckend Car-Park/Duckend Farm sites and Mid-Term Car-Park sites at Stansted seem to have been involved in the processing of large quantities of spelt wheat, which had been intensively cultivated with little evidence for either weeds or relict crops in the assemblage. The analysis of animal bone suggests that there was an increase in the number of cattle kept in proportion to other livestock, with animals being kept for meat, dairy and draft. Pollen from a wide variety of tree and shrub species was also recovered, although not in quantities to suggest widespread woodland in the area, the shrubs may indeed represent hedgerows. The presence of fast-growing round-wood in some of the samples may indicate that some of the available woodland was being managed by coppicing or pollarding.

The gravel terraces along the Blackwater estuary

Palaeoenvironmental analysis of the well contents from Langford Road, Heybridge (Langton and Holbrook 1997) revealed that the surrounding area was predominately under arable cultivation, with grazing/grassland somewhat further away. There is little evidence for woodland or scrub. However, the field-system at Chigborough, with its accompanying wells and waterholes, has been interpreted as representing stock enclosures, probably for cattle or horses, both of which require large quantities of water (Wallis and Waughman 1998). By contrast at Elms Farm, Heybridge the Late Iron Age/early Roman agricultural economy appears to have been entirely arable, become partially pastoral by the mid Roman period, reverting to arable with signs of agricultural intensification in the later period (Atkinson and Preston forthcoming).

The brick-earths of the south-east

The evidence for the rural economy of the North Shoebury site in the south-east corner of Essex reflects its location close to the Thames estuary (Wymer and Brown 1995). Here the emphasis seems to have been on cereal production, primarily spelt wheat, on the free-draining brick-earth terrace. Sheep/goat formed a greater proportion of the faunal assemblage than they did further inland; the slaughter patterns suggest flocks of relatively old animals, presumably kept for wool and/or milk. Oyster shell was ubiquitous on the site and appears to have derived from both natural and managed beds. The presence of eel-bones, the charred fruit of sea club rush and

whelk also emphasise the importance of the coastal and marine environment to the local economy. The whelk in particular needs a specific hunting technique involving baited pots. In summary the economy of the Roman coastal farms appears to bear close comparison with those of the medieval and early post-medieval periods.

The west and south-west of Essex

Examination of pollen and radio-carbon dating of sediments from a shallow valley bog in Epping Forest has provided information on the forest's development over the last 4,000 years (Baker, Moxey and Oxford 1978). From the Neolithic to the early Saxon period it comprised lime-dominated woodland. There is no evidence for large-scale clearance of the forest in either the Iron Age or Roman periods, despite the presence of two hill-forts, Ambresbury Banks and Loughton Camp, on the central forest ridge. How far the forest extended is not known, there is a line of Roman sites along the Roding Valley, but whether these mark the forest edge or simply a break in the forest is uncertain. There is some information regarding the agricultural economy from sites in the Harlow area. The faunal remains from Harlow temple, like those from Great Chesterford Temple, were dominated by lamb bones, but as a specially selected group these do not necessarily reflect the wider economy. The excavations at the rural site at Old House, Harlow (Medlycott 2000, 63–4) demonstrate that cattle are the predominant species, with sheep/goat the next most frequent. The slaughter patterns show that the cattle were largely slaughtered as mature animals, whilst there is a more equal proportion between mature and immature sheep/goats, suggesting that meat and wool production were equally important.

The rest of Essex

Insufficient work has been undertaken in the Tendring and Dengie peninsulas to enable a good picture as to the Roman agricultural landscapes or economies of those areas. However, it can perhaps be presumed that those areas that bordered the marshes would have made extensive use of the marshland resources, as has been demonstrated for those sites in a comparable position in the south-east of the county.

FUTURE RESEARCH TOPICS

It is evident that a considerable body of work has been undertaken since the publication of the 1996 syntheses by Going and Wickenden. However many themes and issues still remain poorly understood or require further analysis.

- Landscapes
  - How do the different settlement types interrelate, what role does each play within the wider economy? The organisation of territories and estates and how these relate to earlier and later periods needs further study. This would include an examination of settlement types, field systems and landuse.
  - Opportunities should be sought for palaeoenvironmental sampling and dating of alluvial deposits. For large-scale developments a programme of targeted sampling should be submitted as part of the EIA. By this means the changing nature of the Roman landscape and issues such as changes from pastoral to arable agriculture, the reduction or regrowth of woodland could be better addressed.
  - Roman roads: we are slowly adding to our knowledge of the network, but we need to find a lot more archaeological evidence before we can produce a comprehensive synthesis of roads and lesser routeways. Also, as monuments, they are under-studied – What variations in structure exist? Are they different in the countryside, and on different terrain? Why did some disappear and some continue in use?
  - The Roman coastline and sea levels: The role of river management, estuarine and riverine trade and the identification of harbours and ports and installations associated with the Saxon Shore Forts all need further study.
  - Ground-truthing of the aerial photographic evidence would help refine the dating and typologies of both the complex and simple enclosure settlement types. This could take the form of either selective trial-trenching or field-walking.

- Towns
  - There is now scope for significant developments in our understanding of the inter-relationships between towns and their hinterlands.
  - Several urban excavations still need analysis and synthetic publication, most importantly Braintree and Chelmsford, but also Kelvedon.
  - Further research is needed into the character of late Roman towns in the county, including their relationship with the Saxon Shore forts.

- Rural settlements – Many rural sites have been excavated in recent years, this data needs further collation and analysis.
  - What forms do the farms take, what forms of buildings are present and how far can functions be attributed to them, are there chronological/regional/landscape variations in settlement location, density or type?
  - How far can the size and shape of fields be related to the agricultural regimes identified?
  - The processes of transition – Iron Age into Roman and Roman into Saxon – needs further examination
  - There is increasing evidence for the survival of the round-house into the 2nd century and beyond, what was it used for?
  - The geophysical surveys at Great Chesterford and Leaden Roding have demonstrated how much they can add to our understanding of the morphology of a known site, and this methodology could be usefully extended to other green-field sites such as Chignall St James, Gestingthorpe and Rivenhall.

- The military
  - What was the economic and social impact of the military on the county?
  - Could we identify the early Roman military presence through artefact studies (e.g. synthesis and analysis of PAS data, Evan's re-assessment of pottery assemblages).
  - How did the military presence in Essex change over the centuries?

- Ritual
  - The evidence for change in ritual practices, including the introduction of Christianity needs re-assessing
  - The role or rural shrines and temples needs further consideration – where are they sited, which communities (if any) did they serve?

- Roman/Saxon transition
  - There is increasing evidence from excavations for sites which span the transition period between the Romans and Saxons – why do some sites appear to span the periods and others end.
  - What is the landscape evidence for population decline or movement
  - It is evident that within the east of England there are regional differences, perhaps due to relative proximity to the coast or the presence of sub-Roman politys as at St Albans – how far is this reflected in the Essex area?

- How does Essex fit within the wider East Anglian region?
  - There is evidence of large-scale variation across the East Anglian region in the Roman period – is this the regional divergence a reflection of Iron Age/Roman regional variations, is what we are seeing in fact tribal distinctions?
  - What is the evidence for continuity and change in settlement structures and land use across the region at this time – how can these be explained at a landscape, economic and political levels.

- Finds
  - There is considerable scope for further study of themes such as mortaria and samian bowls used differently on rural sites than on urban, as seems to be the case in some areas.
  - A brief survey suggests that pudding-stone querns are more common on rural sites than urban where their place is taken by lava querns (Niblett 2006), does the distribution of other categories of finds show similar variations?
  - Does material in early Roman graves indicate differences in response to Roman rule/influx of new settlers in the post-invasion period.
  - The information gathered by the PAS needs further analysis and integration.

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Ancient and planned countryside: the origins of regional variation in landscape character across Essex and East Anglia

Stephen Rippon

INTRODUCTION

The character of our landscape forms an important part of our sense of identity: parachute into a countryside of large arable fields and winding lanes, amongst which are dotted moated manor houses and small hamlets of timber-framed houses, many with elaborate pargetted plasterwork painted in pastel shades, and it would immediately be clear that one had landed in northern Essex or East Anglia. In the East Midlands, by contrast, settlement patterns are far more nucleated, and some areas have distinctive corrugations on the surface of fields that in places are long, narrow, and with a curvilinear plan that indicates their origin as being in the enclosure by agreement of former open fields. Recent changes such as increasingly intensive modern farming techniques, the replacement of diverse deciduous woodland with tiresome conifer plantations, and the disappearance of local vernacular building traditions from modern house developments are, however, steadily eroding local and regional variations in landscape character such as these, although if we could go back in time several centuries differences in how the countryside looked would have been even greater. This paper will explore some key aspects of regional variation in the development of today's historic landscape in Essex and East Anglia, and in particular the crucial period between the 7th and the 9th centuries when it will be argued that there were profound changes in the landscape right across southern England.

In recent years there have been a series of studies of regional variation in landscape character within England, although the seminal work of Lewis, Mitchell-Fox and Dyer (1997), Roberts and Wrathmell (2000; 2002), and Williamson (2003) all have a very Midland-centric focus. In these and other recent studies (eg Jones and Page 2006; Oosthuizen 2006; Gerrard with Aston 2007), debate has concentrated on when and why dispersed settlement patterns were replaced by nucleated villages and open fields across a large swathe of central England – what we will call the 'central zone', characterised by what early topographical writers such as Leland referred to as 'champion' countryside of nucleated villages and open fields – in contrast to areas such as Essex and the South East where settlement patterns were relatively dispersed, this being the 'woodland' countryside of Leland characterised by its closes held in severalty (Slater 1907, 47). Rackham (1986a) describes these as 'planned' and 'ancient' countryside respectively (Fig. 1). In the early 20th century, Gray (1915, 387) suggested that 'the early field system of few English counties is so difficult to describe as that of Essex', and this may account for the relative neglect of that county's historic landscape compared to other parts of southern Britain. This neglect of not just Essex but many areas outside the 'central zone' of the English landscape has almost certainly contributed to a particular perspective on the origins of this major variation in landscape character which suggests that the replacement of dispersed settlement patterns in areas such as the East Midlands with nucleated villages reflects how this area was socially and economically more vibrant than the peripheral areas either side. For example:

> 'the areas where the nucleated village was the dominant form of settlement in the middle ages, appear to have had consistently higher proportions of arable land in cultivation in 1086, which is likely to reflect a long standing bias towards cereal cultivation … In other regions, however, this adaptive evolution of field boundaries and settlements was not followed. Where the arable contribution to the economy was less dominant, the pressure on the land never reached the point at which a transformation of the landscape seemed either necessary or desirable. Although the areas of continued dispersed settlement were subject to the same factors, such as increased population or the emergence of markets, nonetheless the availability of additional land for cultivation, their pastoral interests, or opportunities to make a living from the woods and wastes, insulated them from radical change' (Lewis *et al*. 1997, 198–200).

So were areas such as Essex rather backward and remote from the centre of agrarian change in the medieval period? Does the failure of this transformation of the landscape, that elsewhere produced villages and open fields, to reach areas such as Essex imply that here the Romano-British landscape simply remained in use, to form the foundations of today's countryside? Was anything happening in the Essex landscape while the Midlands were being reorganised?

VARIATION IN LANDSCAPE CHARACTER WITHIN 'GREATER EAST ANGLIA'

One effect of landscape archaeologists and historians focussing on the origins of villages and open fields in England's 'central zone' is that more subtle, but nevertheless important, variations in landscape character have been somewhat overlooked. One of these important boundaries in landscape character has recently been identified in a number of studies as running along the Gipping and Lark valleys in Suffolk, roughly between Ipswich and Bury St Edmunds (Figs 2–4: Williamson 2006a; 2006b; Martin 2007; Martin and Satchell 2008; Rippon 2007; 2008). In the later medieval period this marked the division between landscapes characterised by some open field to the north (in Norfolk and northern Suffolk), and predominantly enclosed fields to the south (in southern Suffolk and Essex). The former area appears to have had a greater Scandinavian influence in the late 1st millennium AD, and had a far larger proportion of tenants at the time of the Domesday survey who were free (Martin 2007; Martin and Satchell 2008, 217–25). In the Middle Saxon period (the late 7th to early 9th centuries) this boundary also marks the southern-most extent to which

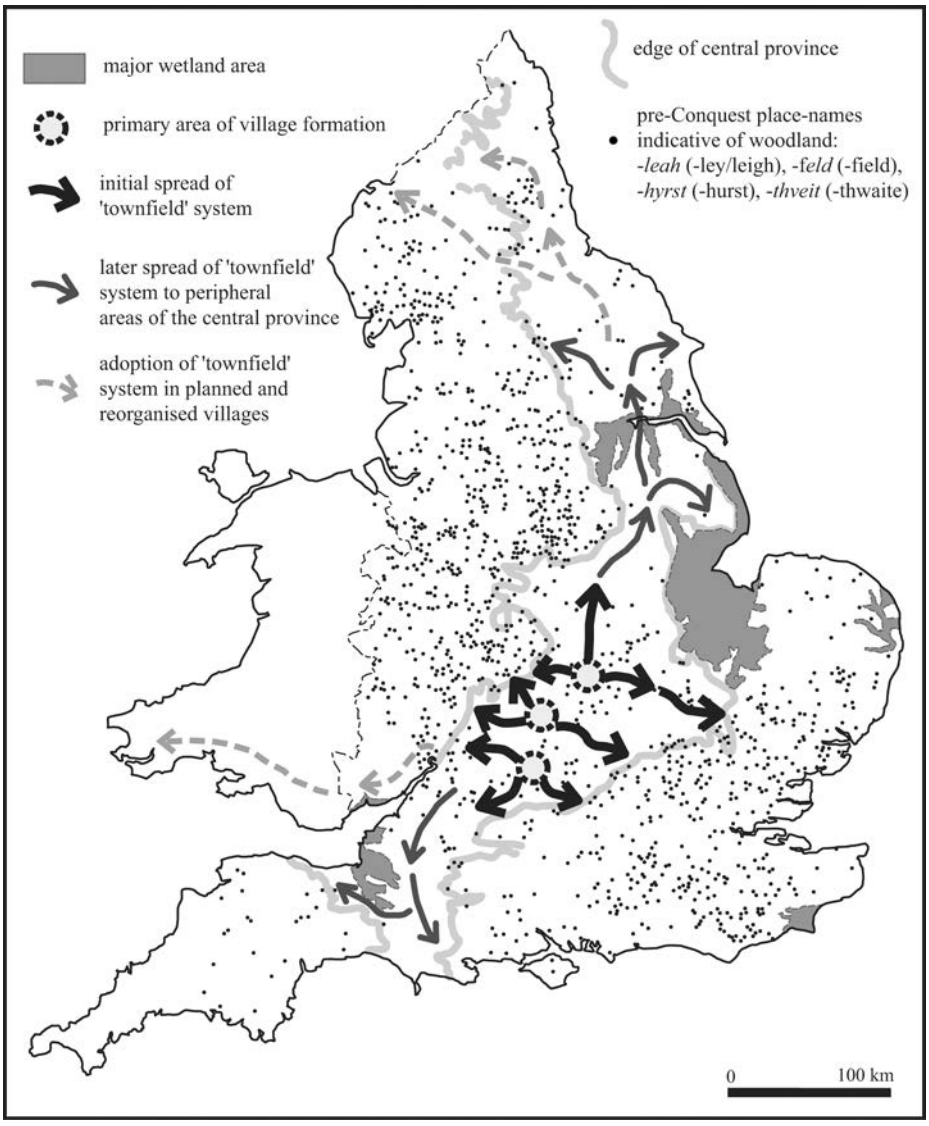

FIGURE 1: A characterisation of the English landscape based on studying 19th century settlement patterns (after Roberts and Wrathmell 2000).

Ipswich Ware was in widespread use and was also marked by a series of trading centres such as Ipswich and Coddenham that appear to have lain along the frontier between the East Angles and the East Saxons. In the 5th to mid 7th centuries this boundary is also evident as we see far larger numbers of Early Anglo-Saxon cemeteries to the north, compared to the south. In the Roman period there are greater numbers of villas to the south, while in the late Iron Age pottery styles, coinage and other metalwork suggest that this was the boundary between the Iceni to the north and the Trinovantes to the south (Figure 3C; Davies 1999; Martin 1999; Curteis 2006). So if these two regions formed socially, economically and politically different cultural provinces from the Iron Age through to the early medieval period, how did their landscape differ?

CONTINUITY IN THE FIELDSCAPES OF ESSEX

As Essex never experienced the transformation of the landscape that saw the development of villages and open fields, and does not seem to have experienced such a large-scale Anglo-Saxon immigration as areas to the north of the Gipping-Lark line (Tyler 1996; West 1998; 1999), it might be expected that this is an area where the greatest continuity in the use of Romano-British field systems is to be expected. This is a topic that has seen much discussion, though mostly in terms of the well known and much debated 'co-axial' landscapes identified in the modern pattern of fields and roads by Drury and Rodwell (Drury 1978; Drury and Rodwell 1980), Rackham (1986b), and Williamson (1987; 1998; and see Martin and Satchell 2008). Although some of these planned landscapes can now be dated to the medieval period (Wilkinson 1988; Rippon 1991), excavations at places such as Little Waltham, Rivenhall, and Great Fanton Hall do suggest that Romano-British field boundaries are indeed on the same alignment as these co-axial systems (Drury 1978; Rodwell and Rodwell 1986; Dale *et al*. 2005, and see Rippon 2008, fig. 5.9). There are also plenty of other examples of excavated Romano-British field systems corresponding very closely to the general orientation and in some cases the specific alignments of today's historic landscape, such as Great Holts Farm in Boreham (Figure 5; Germany 2003; other examples of potential continuity such as this are described in Rippon 2008). This is not to say that across Essex all Romano-British field systems have survived in use: at Great Holts, for example,

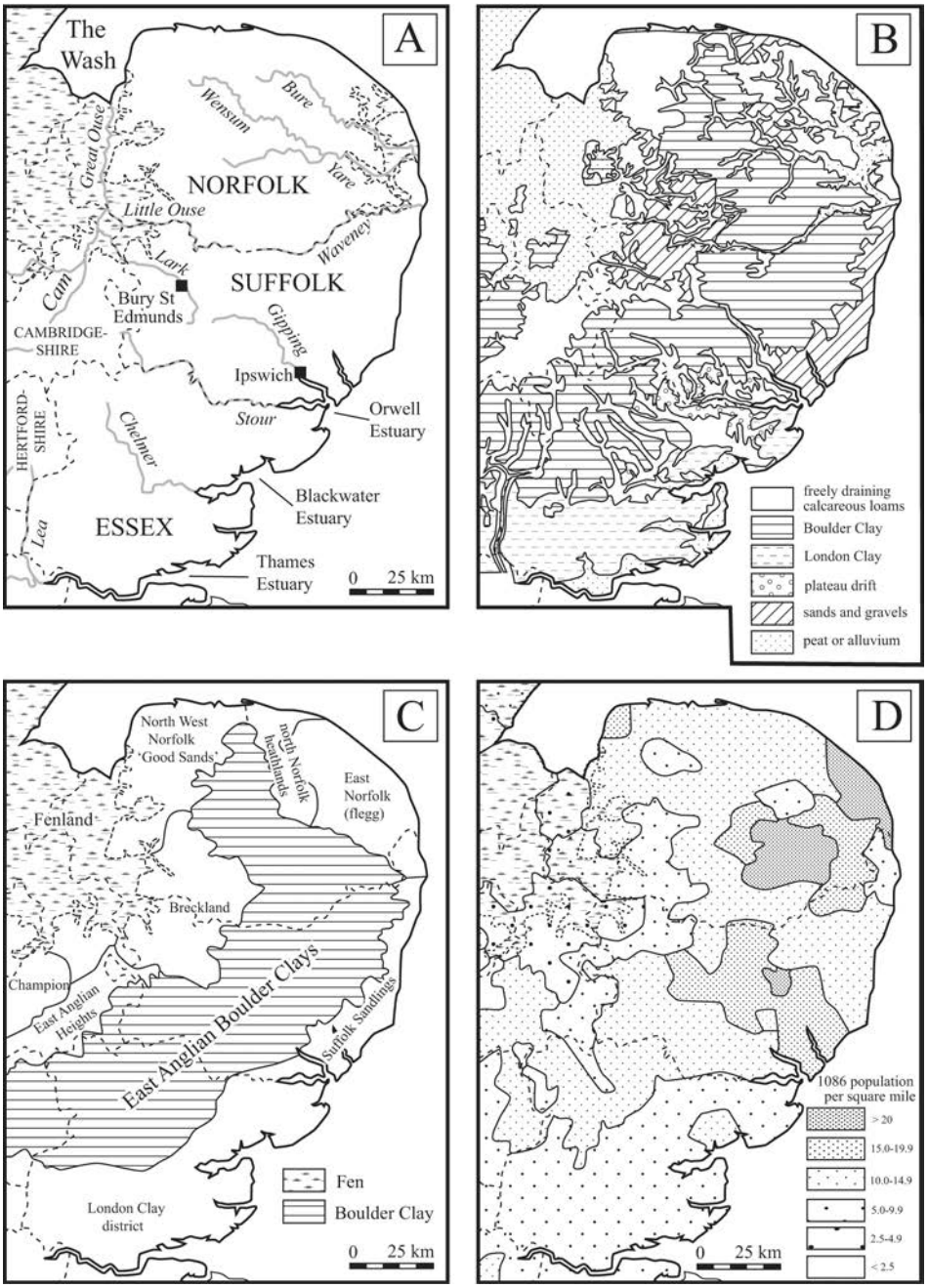

FIGURE 2: Aspects of the East Anglian landscape. (A) major rivers; (B) soils (after Williamson 2003, fig. 8); (C) major physical *pays* (after Williamson 2003, fig. 22); (D) Domesday population density (after Darby 1977, fig. 34). Drawing by Adam Wainwright.

it is only to the north of the excavated area that the medieval/modern field systems appear to have had their origins in the Romano-British period, while to the south there appears to have been discontinuity. The same is seen at Ardleigh where some elements of the extensive Romano-British cropmark complex appear to have survived in use to form the basis of today's historic landscape, while other components have been abandoned, presumably as this landscape gradually evolved over time (Figure 6; Brown 1999).

Overall, what we appear to see across Essex is a mixed picture whereby some Romano-British field systems survived in use until the present day, others gradually went out of use as the landscape evolved in a piecemeal fashion, and a few places where a reorganisation of the landscape in the medieval period led to whatever survived of the Romano-British countryside being swept away (see discussion of Mucking below for an example). This picture of significant continuity in many areas, particularly away from the heavier interfluves on the Boulder clay plateau, is supported by the available palaeoenvironmental sequences that suggest no widespread regeneration of woodland in the early medieval period in the lowland areas. In the Crouch estuary, for example, a 5th to 7th century peat layer produced very low levels of tree pollen, suggesting an open landscape (Crouch site 9: Wilkinson and Murphy 1988, 49). At Chigborough and Slough House Farm, north of the Blackwater estuary, samples from a series of 7th century features show a less wooded (in fact almost treeless) landscape compared to the Late Iron Age/early Roman period, and with far greater cereal cultivation (Wallis and Waughman 1998, 172–204). At the Sandon Culvert site, in the mid-Essex Chelmer Valley, plant macrofossils from a sequence of channel fill that accumulated between the Roman period and around

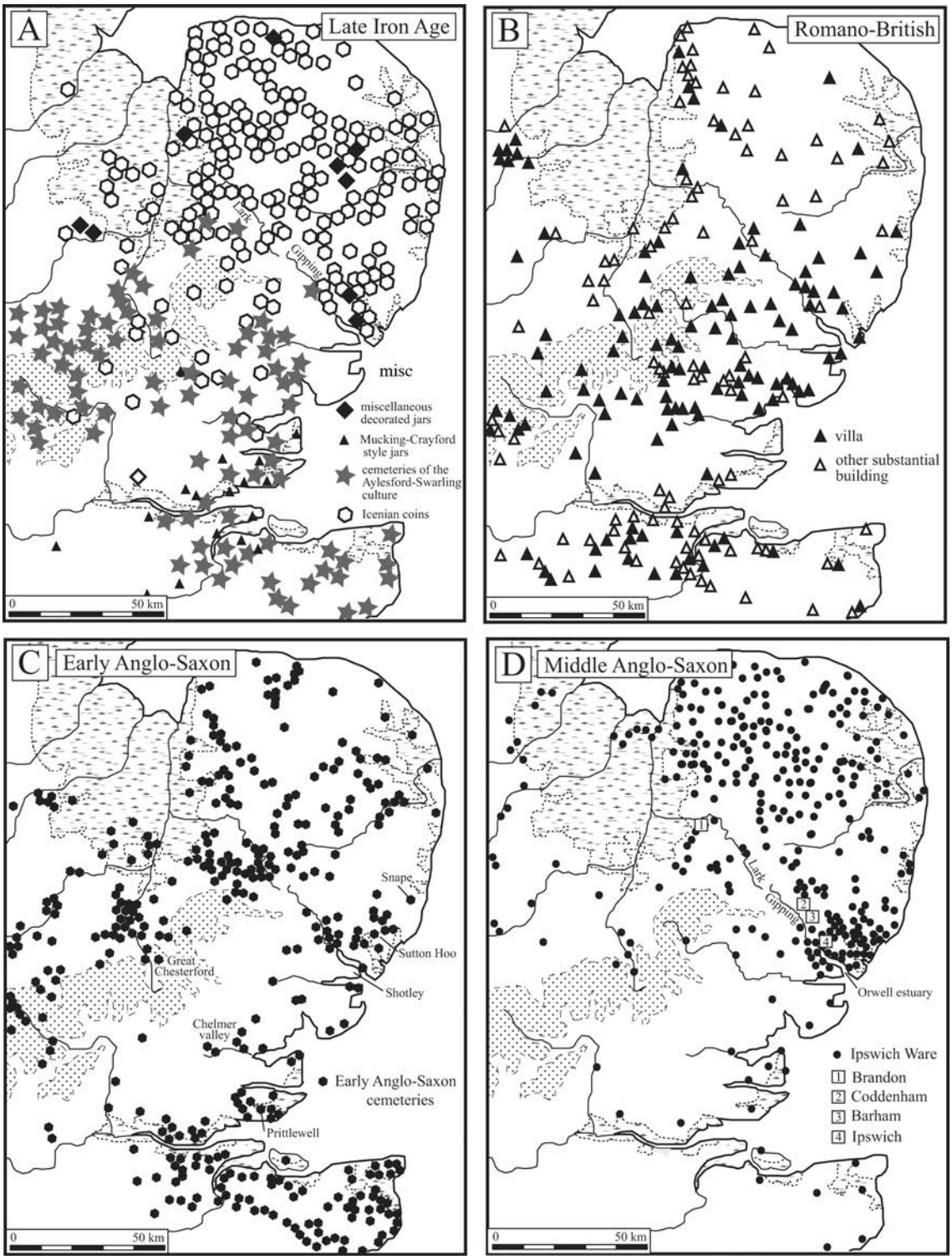

FIGURE 3: The significance of the Gipping and Lark valleys in the greater East Anglian landscape. (A) selected Late Iron Age pottery, coins, and burials (Cunliffe 2005, figs 5.9 and 7.6); (B) Roman villas and other substantial buildings (Ordnance Survey 2001; Going 1996, fig 1; Plouviez 1999, 43); (C) Early Anglo-Saxon cemeteries (Penn 1994, 37; Tyler 1996, fig 1; West 1999, 45; Riddler 2004, 27; Morris 2005, fig. 9.39); (D) the distribution of Ipswich Ware (Blinkhorn 1999, fig 2; Suffolk Historic Environment Record).

the 12th century suggests an open landscape throughout, with relatively little woodland (Murphy 1996, 25–6). At Stansted Airport, on the Boulder Clay plateau in North West Essex, pollen and plant macrofossils from the 'BRS' palaeochannel also indicate a largely open landscape in the 6th to 7th centuries with some cereal cultivation in the vicinity and microscopic charcoal similarly indicating human activity; around the late 6th or 7th centuries the palaeochannel started to dry out and there was an increase in cereal cultivation (Havis and Brooks 2004, 350–4). In the light of this palaeoenvironmental evidence it is somewhat surprising to see Cooke *et al*. (2008, xiv) assume that the lack of evidence of 5th to 7th century settlement in the 1999 to 2004 programme of excavations at Stansted was because of 'large scale reversion of much of the

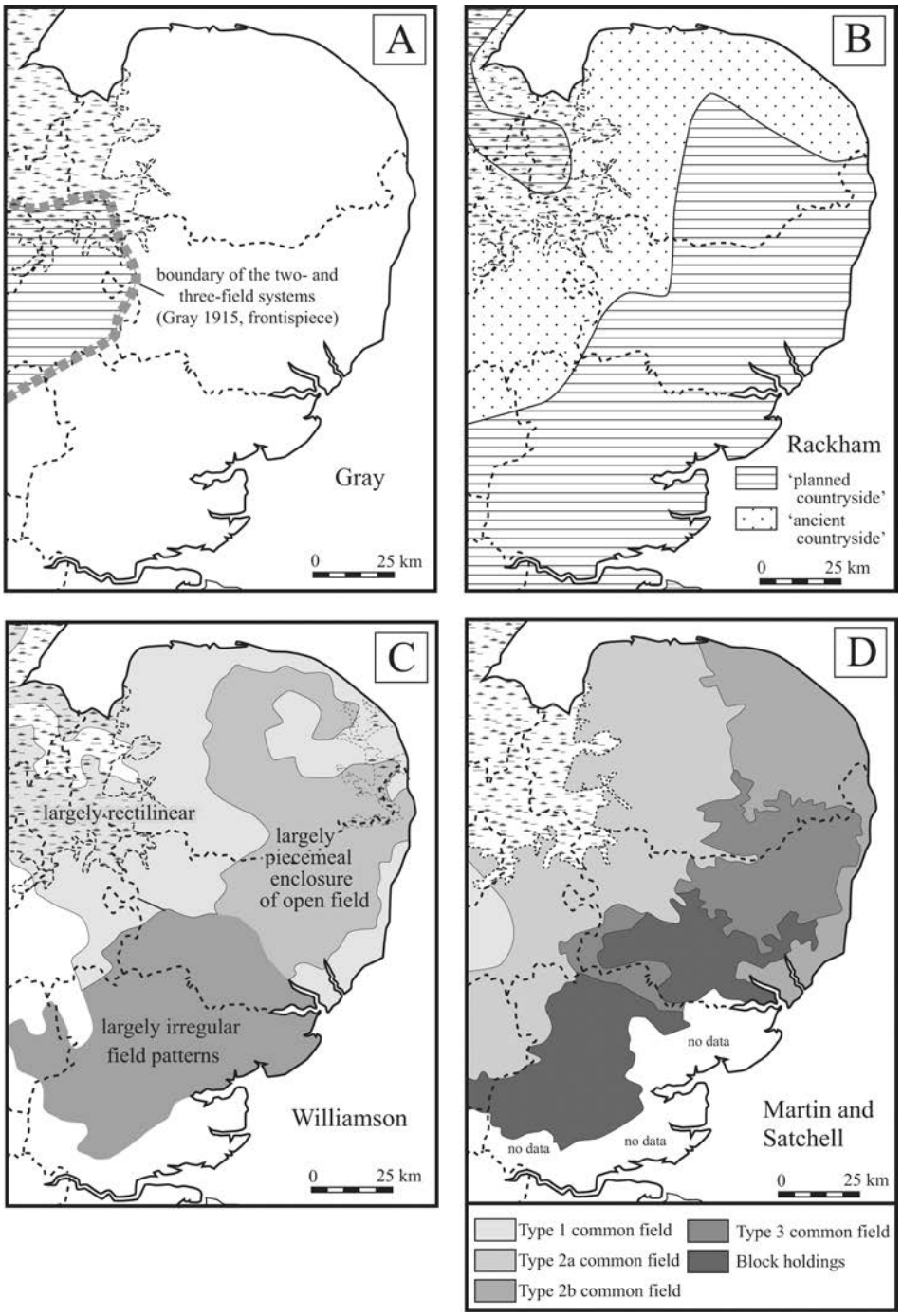

FIGURE 4: Mappings of landscape character in greater East Anglia. (A) two- and three-field systems (Gray 1915, frontispiece); (B) 'planned' and 'ancient' countryside (Rackham 1986a, fig. 1.3); (C) rapid characterization of 19th century field shape (after Williamson 2006, fig. 3.12). (D) the East Anglian Fields Project (after Martin 2007; Martin and Satchell 2008). Drawing by Adam Wainwright.

area to woodland'. It is difficult to determine how many of the late Romano-British features actually continued in use into the 5th century in an area that away from the limited Anglo-Saxon immigration that the coastal districts of Essex saw at this time was largely aceramic. There may indeed have been a decline in the amount of settlement but that does not necessarily mean there was a widespread woodland regeneration as a relatively open landscape could have been maintained through grazing: rather than *assuming* large-scale woodland regeneration we need *evidence* for it, and this is presently lacking. Overall, there is no evidence for a widespread discontinuity in the landscape at the end of the Roman period, and in the lowlands at least some evidence for the survival of Romano-British field systems.

DISCONTINUITY IN THE FIELDSCAPES OF NORTHERN EAST ANGLIA

This pattern of early medieval landscape development that we have seen in Essex, in which there is strong evidence for a degree of continuity, can be contrasted with the picture to the north of Gipping-Lark line. The Romano-British landscape in what is now Norfolk and northern Suffolk appears to have been subtly different to that further south, notably in the more limited extent of villas and other highly Romanised

FIGURE 5: Great Holts Farm, Boreham: the excavated Romano-British settlement and field system in the context of today's 'historic' landscape (after Germany 2003, figs 4, 12, 13, 17, 48, 49, and 50. The common orientation, and in some cases actual alignment, of late Romano-British field boundaries and components of the historic landscape suggests some continuity in the management of this area, although this does not preclude a reduced intensity of agricultural exploitation, for example a shift from arable to pasture. This example clearly shows how important it is to always publish maps of excavated features against a background of the historic landscape, so that issues such as continuity can be examined.

settlements, while in the 5th to 6th centuries the evidence of both cemeteries and settlements suggests far more significant immigration from the continent (Fig. 3). This Anglo-Saxon colonisation appears to have extended right across the region, in contrast to Essex where distinctively Germanic material culture, burials and buildings concentrate around the coast and major estuaries. While this early medieval immigration into the area north of the Gipping – Lark line will no doubt have caused some disruption to the countryside, a series of pollen sequences all show broad continuity in land-use from the late Roman through to the early medieval period, with a largely open, pastoral landscape and some arable on the lighter soils: there may have been some contraction in the extent of cultivation, but this was replaced by grassland, and there was very limited or no woodland regeneration.[1] An indication that the heavier soils of the interfluvial areas may not have been entirely abandoned is that seeds of a distinctive species of weed (*Anthemis cotula*, stinking mayweed) from amongst the cereals at the Early Saxon settlement at West Stow suggest some arable cultivation continued on the Boulder Clay (Murphy 1985, 105).

Around the 8th century, however, the palaeoenvironmental record suggests a period of significant agrarian change. The well-dated pollen sequence from the Oakley palaeochannel at Scole, for example, suggests a marked agricultural intensification (with a calibrated radiocarbon date of AD 670–820) when there was an increase in cereal pollen, the emergence of viticulture, and the cultivation of hemp (Martin and Satchell 2008, 115–16; Wiltshire forthcoming). At Micklemere there was also a marked increase in cereal pollen dated cal AD 588–972 at the same time as there was a high influx of mineral sediment, implying increased soil erosion in the catchment (Murphy 1996, 29). Other pollen sequences from northern East Anglia show a period of agricultural intensification in the early medieval period that may date to around the eighth century, although the dating evidence is less accurate at these sites: at Old Buckenham Mere there is a decline in oak woodland dated '*c*. 800AD' (Godwin 1968, 102),

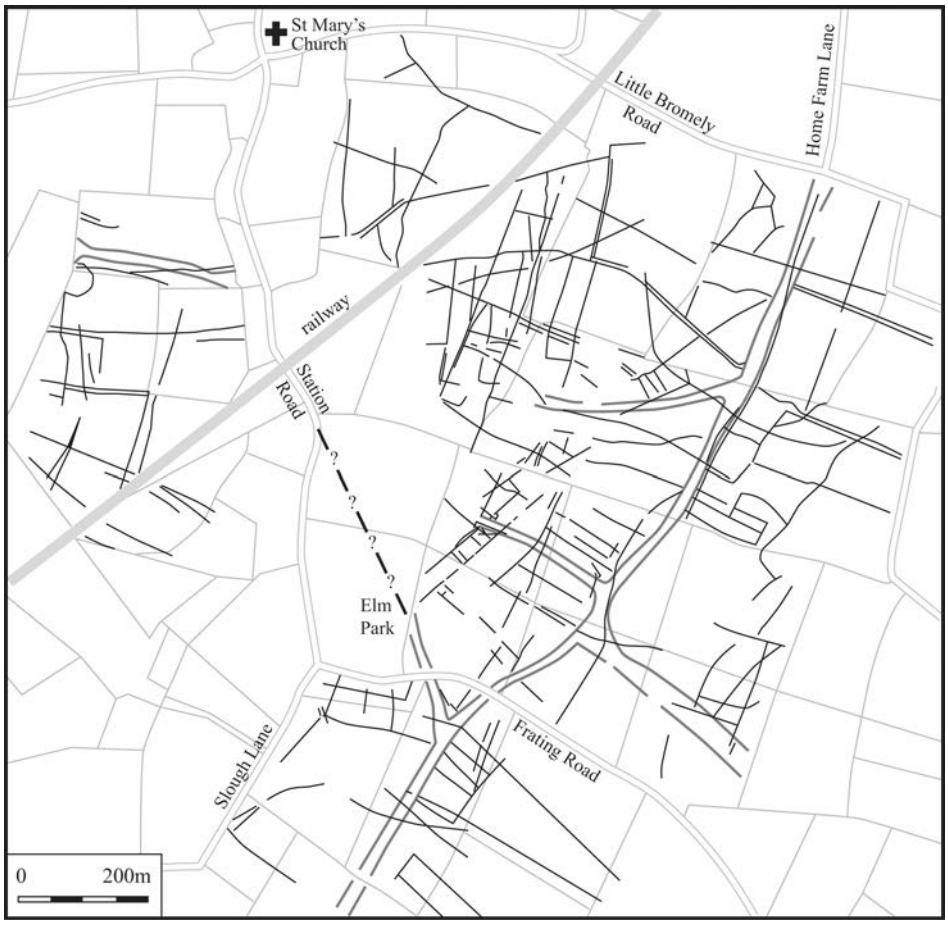

FIGURE 6: Relationship between the historic landscape (taken from the First Edition Ordnance Survey Six Inch maps) and the cropmark complex at Ardleigh in Essex showing partial continuity/survival of the major structural elements (after Brown 1999, figs 3 and 4). Drawing by Adam Wainwright. This example clearly shows how, as at Great Holts, the landscape of this area was a palimpsest with aspects of both continuity and discontinuity.

while at Diss Mere (Peglar *et al*. 1989), Old Buckenham Mere (Godwin 1968) and Sea Mere (Simms 1978) there is a marked increase in *Secale cereale* (rye), *Avena/Triticum* type (oats or wheat), *Hordeum*-type (barley) and *Cannabis*-type (hemp) pollen at around '1500 BP'. At Hockham Mere a similar expansion in cultivation is dated to 'around 1300 BP' (Sims 1978, 57; Bennett 1983a, b).

This intensification of agriculture is part of a far wider pattern of landscape change seen across parts of southern England in what historians have recently called the 'long eighth century' (Hanson and Wickham 2000; Wickham 2005) and which archaeologists have traditionally called the Middle Saxon period (for a more detailed exploration of landscape change in this period see Rippon *et al*. 2006; Rippon 2008). Across northern East Anglia, fieldwalking and metal detecting surveys show a major dislocation in the settlement pattern at this time, with a dispersed scatter of Romano-British and 'Early Saxon' settlements being abandoned in favour of a series of nucleated villages, the locations of which are now marked by parish churches (eg Bendish: Rogerson *et al*. 1997; the Deben Valley: Martin *et al*. 1995, 344; Newman 1992; 2005a; 2005b; the South Elmhams: Martin *et al*. 2002, 213; Sudbourne: Martin *et al*. 1992, 378; Westleton: Martin *et al*. 1994, 208). Large-scale excavations outside these villages is also consistently revealing a dispersed settlement pattern in the Roman and Early Saxon periods that was abandoned in the 7th or 8th centuries (eg Kilversdon: Figure 7; Melford Meadows in Brettenham: Mudd 2002), while work within medieval villages – both where they are still-occupied and have been deserted – is increasingly producing evidence for occupation associated with 'Middle and Late Saxon' pottery (eg Mileham: Gurney and Penn 1998, 201; Whissonsett: Mellor 2004; Gurney and Penn 2005, 752, 762; Trimble 2006). Although the fieldwalking surveys suggest that most of the dispersed settlement pattern associated with 'Early Saxon' pottery was abandoned before Ipswich Ware came into circulation, a phenomena that is now dated to the early 8th century (Blinkhorn 1999), some elements of the 5th to 7th century dispersed settlement pattern have produced small amounts of this 'Middle Saxon' pottery such as Lakenheath (Jo Carruth pers. comm.), Bloodmoor Hill in Carlton Colville (Tipper *et al*. 2009), West Stow (West 1985, 137), and some of the sites in the Deben Valley (Newman 1992, 32; 2005a, 481–3). Overall, it appears that the nucleation of settlement occurred in the late 7th to 8th centuries.

Another facet of landscape change during the 'long eighth century' is the gradual recolonisation of the heavier claylands. On some sites away from the village cores there are just a few sherds of Ipswich Ware amongst what are predominantly Late Saxon scatters and these are probably 'daughter settlements',

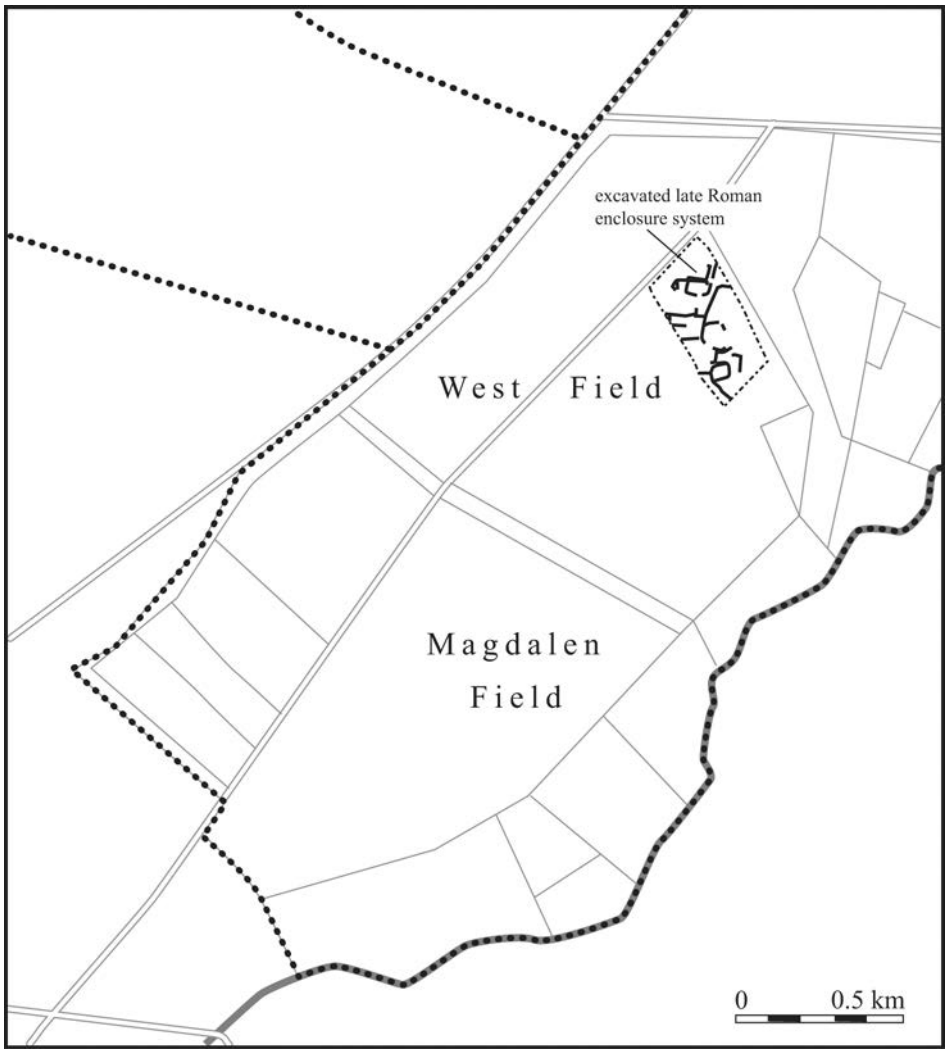

FIGURE 7: The relationship between the late Romano-British enclosure complex at Kilverston and the historic landscape based on the Tithe map of 1839 (redrawn based on the Ordnance Survey First Edition Six Inch map) (after Davison 1988, fig 8; and Garrow *et al*. 2006, fig. 4.13). Drawing by Adam Wainwright.

in peripheral areas of parishes (Newman 1992, 34; 2005b, 483). The formation of these secondary settlements marks the beginning of a trend towards the dispersion of settlement with the migration of farmsteads to the edges of large commons that occupied areas of heavier soil in the interfluvial areas (Wade Martin 1980; Warner 1987, 17–18; Newman 2005b, 483). From around the 11th century the migration of settlement away from the villages towards nearby commons and greens became widespread, and many parish churches were eventually left isolated: for much of northern East Anglia, the era of villages was short lived. This same pattern – of a small number of relatively compact villages associated with Middle and Late Saxon pottery, followed by the expansion and migration of settlement along droveways towards areas of common land – is also seen in the extensive reclaimed wetlands of the Norfolk Marshland, in the far west of the county. As a reclaimed wetland that saw extensive post-Roman flooding, this was a 'cleaned slate' upon which the medieval landscape was created without an antecedent cultural landscape to affect its character, and the similarity of landscape development here compared to the dryland areas of Norfolk suggests that nucleated villages were the way that society in the north of East Anglia chose to structure its landscapes in the 'long eighth century' (Silvester 1988; 1993; Rippon 2000a, 208–11; Rippon 2008; Crowson *et al*. 2004).

Overall, the 'long eighth century' was one of profound landscape change in northern East Anglia. The Romano-British and earliest medieval (5th to 7th centuries) settlement pattern of dispersed farmsteads and small hamlets was swept away and replaced by far fewer villages. Settlement started to expand into areas that had previously seen little or no settlement such as the heavier interfluvial plateaus and marshlands. There was an expansion in arable cultivation and the appearance of new crops such as viticulture and hemp. By the 12th century we also know that this region north of the Gipping – Lark line had significant areas of open field, and while the origins of this new way of organising agricultural land are unclear, the abandonment of the excavated areas of settlement at Kilverstone gives us a *terminus post quem* for the laying out of the common fields over the same area of around the 8th century (Figure 7; Davison 1988, 18–32; Garrow *et al*. 2006). Martin and Satchell (2008, 223) suggest that the common fields in northern East Anglia were introduced during the period of Scandinavian domination

around the 9th century as land was shared out amongst the newly created free tenantry.

THE 'MIDDLE SAXON' LANDSCAPE IN ESSEX

Having seen clear evidence for a transformation of the landscape in the northern part of 'greater East Anglia' during the 'long eighth century', we can now return south and consider what was going on to the south of the Gipping-Lark line at this time. As described above, during the Roman and earliest medieval (5th to 7th centuries) periods there appears to have been continuity in some areas, discontinuity in others, but no widespread transformation of the landscape and certainly no widespread woodland regeneration. Throughout this period settlements and field systems were established, modified and abandoned, with some being longer-lasting than others. The landscape appears to have been in a constant but gradual state of evolution, albeit with certain periods that may have experienced greater change than others, such as the late 4th or 5th century, when there appears to have been a contraction of settlement from areas such as the heavy interfluvial clays of the Boulder Clay plateau.

It has been suggested that across southern England significant numbers of excavated Early Saxon settlements were abandoned around the 7th century (e.g. Mucking in Essex, West Stow in Suffolk, Bishopstone in Sussex, Charlton in Hampshire), which led to the model of a 'middle Saxon shuffle' whereby Early Saxon sites on lighter soils were abandoned in favour of richer soils in the valleys around the late 7th century (Arnold and Wardle 1981; Moreland 2000, 86–7). One problem with this idea is that most of the major excavations of 'Early Saxon' settlements are in locations that extensive field survey is suggesting are not typical of that period, such as the high gravel terrace at Mucking. Hamerow (1991; 2002, 121–4) has also argued that, as many settlements have not been completely investigated, their final phases may lie beyond the edge of the excavations, and Mucking can also be re-interpreted in this way (Figure 8). The eastwards migration of the settlement was clearly demonstrated by Hamerow (1993), and if we place Mucking in an even wider context we see that from the 5th to the 7th centuries the focus of occupation shifted at least 1.2 km from west to east, this distance being calculated from the centre of 5th-century occupation that includes the Linford Quarry site to the west of the main Mucking excavation (Barton 1962), as far west as the 'North Ring' site excavated in 1978 separately from the main Mucking campaign where the occupation is dated to the late 7th century (Bond 1988, 20, 45–51). Just *c.*900 m further east lies the parish church, the earliest fabric of which is (?)12th or 13th century (RCHME 1923, 94). This raises the possibility that rather than there being a sudden dislocation of settlement, whereby it shifted from the gravel terrace to the lower-lying site occupied by the parish church – the 'Middle Saxon shuffle' model – it actually ended up there by continued, gradual, migration. A few sherds of Ipswich Ware were indeed recovered from the far east of the site which if Blinkhorn's (1999) re-dating is correct takes the occupation of the settlement into the 8th century (and see Hamerow 1993, 22). The discovery of two early 8th-century *sceattas* from the area immediately beyond the edge of the excavations (the precise location is not known), also supports the idea that the settlement at Mucking continued to be occupied until at least that date (Helena Hamerow and Michael Metcalf pers. comm.). Another significant feature of this site, however, is that the early medieval settlement appears to have been replaced by an open field system whose strips and furlong boundaries were still preserved within the historic landscape when it was first mapped in 1846 (Figure 8; ERO D/P 108/27/2; Clark 1993, 22). After several centuries of migration, maybe there was after all a transformation of the landscape in this corner of Essex associated with the creation of the open fields sometime after the early 8th century? The open fields did not last long, however, as Walton's Hall and Sutton's Farm, that appear to lie in the southern part of the now enclosed former open field, are recorded as early as 1199 and 1220 respectively (Reaney 1935, 164).

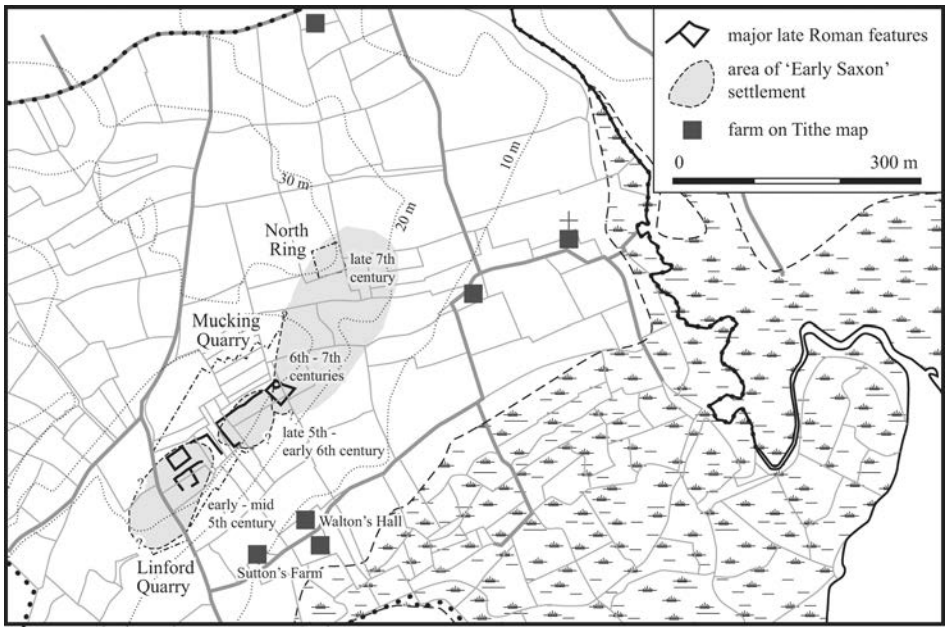

FIGURE 8: The migration of the 'Early Saxon' settlement at Mucking, Essex, in the context of the later historic landscape (based on the Tithe map of 1846: ERO D/P 108/27/2)

Examples such as this, of where the Essex landscape was transformed through the creation of open fields, are in fact very rare and unlike to the north of the Gipping – Lark line there does not appear to have been a widespread episode of settlement nucleation around the 8th century. There have been a number of important excavations of what in this region are called 'Middle Saxon' sites, although these mostly relate to the higher echelons of society, notably the high status site at Wicken Bonhunt (Wade 1980) that Rippon (1996, 121) has suggested was a probable *villa regalis*, Christian communities at Barking (MacGowan 1987; Redknap 1991; Hull 2002), Nazingbury (Huggins 1978; Bascombe 1987), and Waltham Abbey (Huggins 1988), and a possible 8th – early 9th-century coastal trading site near Barking Abbey (Hull 2002). Unfortunately, these sites tell us little about the wider rural landscape. A re-examination of a number of 'Early Saxon' sites, however, suggests that there may have been a closer relationship between the Romano-British and medieval landscapes than was previously thought. At Little Oakley, for example, small amounts of 8th or 9th-century 'Middle Saxon' pottery have been found half way between a Romano-British to late 5th-century settlement and the Domesday manor of Founton Hall, suggesting that the former may gradually have shifted its location eventually becoming the latter (Barford 2002, 164). In other cases, this migration of settlement may have led to the disappearance of Middle Saxon settlements beyond the edges of excavations. In a number of cases, 'Early Saxon' settlements and cemeteries have been discovered during the excavation of earlier enclosures that were clearly visible as cropmarks such as Ardale School (Wilkinson 1988, 42–57), Gun Hill in Tilbury (Drury and Rodwell 1973), Frog Hall Farm in Fingringhoe (Brooks 2002), Orsett Causewayed Enclosure (Hedges and Buckley 1985) and Springfield Lyons (Tyler and Major 2005). All these sites appear to have abandoned around the 7th century but such is the relatively small scale of most excavations need this have been the case? These mostly rescue excavations focused on major cropmark enclosures, but, if the early medieval settlements had migrated to the same extent as Mucking, then they would soon have drifted beyond the areas that were later to be excavated. At the Orsett Cock, for example, three *Grubenhäuser* to the east of the cropmark enclosure were associated with mid 5th to mid 6th-century pottery, including distinctively early *Schlickung*-treated ware (Milton 1987, 30–1), whereas three *Grubenhäuser* to the west, within the old enclosure, were 6th century in date (Carter 1998, 102). Did the settlement continue to drift further into the unexcavated area to the west of the enclosure? And is there a relationship between this early medieval settlement at Barrington's Farm immediately to the north, first documented in the 15th century (Reaney 1935, 166)?

The problem that Middle Saxon settlements may have drifted away from archaeologically very visible sites, such as enclosures and villas, and so have simply not been identified, is compounded by the very limited material culture that appears to have been used on most lower-status sites in this period and the ephemeral traces that timber buildings leave in the archaeological record. On the gravel terraces north of the Blackwater estuary, for example, what has been described as a 'boat-shaped' building (structure 38) constructed with earth-fast posts was not associated with any material culture, although parallels for the building are most common from the 8th to 10th centuries (Wallis and Waughman 1998, 98, 106–8); a group of eight 7th to 8th-century loom weights have been found as packing in a post hole of a rectangular building just 110 m to the north (Tyler 1986). Another aceramic rectangular timber building built from earth-fast posts has been excavated at Takeley, but here a radiocarbon date of 1245+/–35 BP (cal. AD 670–880) establishes a date around the 8th century (Timby *et al*. 2007, 152–6). A hearth or oven in the LTCP site at Stanstead has also been radiocarbon dated to this period (cal. AD 680–890: Cooke *et al*. 2008, 184). At Bishops Park College in Clacton-on-Sea, midden deposits containing mostly 7th to 8th-century grass-tempered pottery and a single sherd of Ipswich Ware were found in the slumped upper fill of a largely silted-up Late Bronze Age ditch, but the only other features certainly dating to this period were a small number of pits. A series of postholes, however, formed the plan of what is described as a 'bow-sided' building for which the only dating was a single fragment of (? residual) Roman brick but the plan is in keeping with an early medieval date (Letch 2005). Another 'bow-sided' building constructed of earth-fast posts has also been excavated at Downhouse Farm in West Hanningfield where the few sherds of 5th to 6th-century pottery were 'insufficient to provide conclusive dating' (Dale 2005). Early to Middle Saxon pottery has also been recovered from Roxwell Quarry, 1.5 km south of the Chignall St James villa (A. Bennett 2000, 220). Finally, a building of beamslot and posthole construction, associated with a series of substantial 1.5 m deep pits at Clements Park, near Prittlewell Camp may date to the Middle Saxon period (Martin Welch pers. comm., 2008).

A crucial conclusion that emerges from this growing corpus of 'Middle Saxon' settlement in Essex is that it is found scattered across the landscape rather than concentrated in villages, and this dispersed form of settlement – although not necessarily the locations of the settlements themselves, as they appear to have been quite mobile – represents the continuation of a tradition of seen in the Roman and Early Saxon periods. Indeed, Essex retained a relatively dispersed settlement pattern into the later medieval period, and neither fieldwalking, aerial survey or large scale rescue excavations have revealed a 'lost phase' of nucleation.

LOOKING TO THE FUTURE

Essex is a county where a large amount of archaeological survey and excavation that has been carried out, relative to other parts of Britain, but there are certainly gaps in our knowledge that need to be filled. In common with many lowland areas, there are relatively few palaeoenvironmental sequences, particularly that cover the past two millennia. If suitable deposits, for example in palaeochannels, could be found and sampled then important light could be shed of local and regional variations in land-use, including whether there was continuity and discontinuity in crucial periods such as the 5th to 8th centuries AD. Although there is now a substantial corpus of data for Romano-British settlement, we remain surprisingly ignorant of what became of them, and indeed where the medieval landscape came from: greater use of radiocarbon dating on the latest phases of Roman sites, and the earliest phases of medieval settlements is urgently required, as well as for aceramic sites that could well fill the gap. The value of small-scale archaeological work within currently

occupied medieval settlements is increasingly recognised, and this should be encourage both within the planning system and as community projects. Finally, there is a desperate need to understand the origins of the medieval field systems within Essex, particularly the enigmatic planned landscapes first recognised in the 1970s (see Rippon 1991).

CONCLUSION

When giving the paper titled 'Essex *c*.700 – 1066' at the Writtle Conference in 1993, there was little the author could say about the rural landscape. Since then our understanding of this crucial period has improved immensely with fieldwalking, large-scale development-led excavation, and palaeoenvironmental analyses all making important contributions. While nationally much attention in recent years has focussed on the development of the important tripartite division of the English landscape into the 'South-eastern', 'Central', and 'Northern and Western' Provinces, and in particular the origins of villages and open fields in the middle of these, other research is starting to reveal significant sub-divisions of these regions. One of these lies roughly along the line of the Gipping and Lark valleys in Suffolk, and the development of the landscape of Essex to the south was very different to that in Norfolk to the north. In Essex, it may be wrong to say that the early medieval period was characterised by continuity, but probably true to say that there was greater continuity than in areas to the north. In part this may have been due to the more substantial Anglo-Saxon immigrations to the north having a rather different character, but is mainly because to the north of the Gipping – Lark line there was a significant transformation of the landscape during the Middle Saxon period that included an intensification of agriculture, an expansion of settlement and colonisation of areas such as the Norfolk marshland, and the physical restructuring of the countryside through the creation of villages and open fields. This transformation never occurred to the south, and in Rackham's (1986a) 'ancient countryside' of Essex we have a landscape that is indeed older and more complex than the 'planned landscapes' of northern East Anglia and the East Midlands.

ENDNOTE

1 Caudle Heath (Wiltshire 1999), Diss Mere (Peglar *et al.* 1989), Hockham Mere (Godwin and Tallantire 1953; K. Bennett 1983a, b; Sims 1978), Micklemere (P. Murphy 1996, 29–31), Old Buckingham Mere (Godwin 1968), Scole (Wiltshire forthcoming), and Seamere (Sims 1978). In such a flat landscape, the catchment of these meres is likely to have been from a radius of about 10–20 km (Jacobson and Bradshaw 1981).

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A review of the archaeology of the East Saxons up to the Norman Conquest

By Martin Welch

The modern county of Essex occupies the core territory of the East Saxon kingdom that emerges into the historical record at the beginning of the seventh century (Fig. 1). At that time the rulers of the East Saxons seem to have controlled lands that were mostly north of the Thames including London, the former county of Middlesex, parts of Hertfordshire as well as the historical county of Essex. In addition at this earliest stage they also probably ruled what became Surrey and they had possessed authority over Kent west of the Medway prior to the late sixth-century expansion of the original kingdom of Kent centred on east Kent.

Our evidence for all this is a mixture of written sources and also archaeology. The documentary material includes Bede's *Historia Ecclesiastica*, the *Tribal Hidage* document, the genealogies of their royal house, the *Sleddingas*, who interestingly claimed descent from a Germanic deity *Seaxneat* rather than the ubiquitous *Woden*, and land diplomas (usually called charters) granting land to church institutions with royal authority. The archaeology principally takes the form of cemeteries containing furnished inhumations or cremations usually in pottery containers, but also settlements represented by postholes, trench constructions, rubbish pits and boundary ditches. At the outset we should recognise that the term 'East Saxon' was artificial and anachronistic when Bede used it in the eighth century to describe these peoples in the seventh century. As Kirby observed, once Bede adopted it everyone else accepted it, but its origin must lie in labels of convenience created to address letters sent from the metropolitan bishop at Canterbury to bishops across the Anglo-Saxon kingdoms (Kirby 1991, 22). With a bishop attached to each converted kingdom, it was easier to differentiate between one group of Saxons and another in geographical rather than dynastic terms. So the East Saxons were those to the east in relationship to non-Saxon Kent and Canterbury, the South Saxons (Sussex) were to the south of Kent and the West Saxons to the west of both Kent and Sussex. A middle label represents a later subdivision and both the Middle Saxons and the Middle Angles appear to postdate the primary kingdoms (Essex and Mercia) to which they were attached. In the case of the West Saxons we are told that they were formerly named the *Geuissæ*, but we have no equivalent information of an earlier or alternative name for the East Saxons or the South Saxons and their royal houses.

The *Tribal Hidage* assigns 7,000 hides of land to the East Saxon kingdom with a hide being defined by Bede as sufficient to support a family (*familia*) meaning an extended family unit. This seven thousand is the standard figure for any medium-sized kingdom in the *Tribal Hidage* and is similarly given for the South Saxons and a number of other comparable political units (Davies and Vierck 1974). The fact that the *Domesday Book* of 1086 assigns a mere 2,700 hides to the shire of Essex surely implies that a great deal of territory had been lost between the seventh and eleventh centuries. The genealogies make it clear that the East Saxon royal house claimed descent from immigrants from Saxon north Germany, while the territories they controlled in England were sufficiently extensive as to require two or three kings to rule at the same time in the seventh to eighth centuries (Yorke 1985; Yorke 1990). Presumably each king would have ruled a 'province' within the overall kingdom. The charters make it clear that East Saxon kings were able to authorise land grants to the church in Middlesex and Hertfordshire (the province of the Middle Saxons) at the beginning of the eighth century. They were soon required to acknowledge the additional permission of their Mercian overlords (Bailey 1989). Indeed during the overlordship exercised by Æthelbald (716–757), Mercian influence changed into direct rule over Middlesex and Hertfordshire. It seems that the East Saxon royal house preferred to accept the reality of Mercian overlordship, however, and acted as loyal adherents gaining the benefits this brought in the eighth to early ninth centuries. Unfortunately we have only limited early charter evidence for Essex itself, relating to grants to St Paul's Cathedral, Minster-in-Thanet (Kent), Barking and Nazeing (Yorke 1985, 4–8; Yorke 1990, 57). This makes it difficult to establish the regions into which the province(s) of the East Saxons was subdivided in the manner we can for Middlesex and Hertfordshire (Bailey 1989; Baker 2006). Dengie and its coastal peninsular represents a named *regio* referred to in a charter (Sawyer 1968, S1787), matching Hemel Hempstead in Hertfordshire (*ibid* S1784). There are also two place-names in Essex with endings in *-gē* (related to modern German *Gau*). These occur at Vange near the estuary to the south of Basildon (Reaney 1935, 174–5: Sawyer 1968, S717 and S1634) and *Ginges*, the former name of an inland extensive district to the south west of Chelmsford (Reaney 1935, xxi). These may well represent early royal villa centres comparable to those documented in Kent at Eastry, Lyminge and Sturry (Welch 2007, 244–5). Unfortunately neither of these Essex districts has produced archaeological evidence to match the concentration of early cemeteries of their Kentish counterparts, especially at Eastry. Further research will be needed if we are to establish the locations of other regions within Essex based on *–ingas* folk names with the *Rodingas* (centred on the extensive Rodings settlements: Reaney 1935, 490), *Berecingas* (Barking), the *Hæferingas* (Havering) and *Yppingas* (Epping) among the more obvious candidates.

East Saxon royal rule over what we now call Surrey seems probable for the early seventh century and represents the remains of a much larger territory south of the Thames that extended from Woking and Chertsey in the west to the Hoo peninsular of Kent in the east. The half that ran between Southwark opposite Roman London eastwards to the Medway was absorbed into the kingdom of Kent in the last decades of the sixth century, either in the reign of Æthelberht or his father Irminric (or Eormenric). Æthelberht was a powerful overlord whose authority appears to have run inland the length of the Thames and who was able to require two kings to accept baptism in Kent with himself as their sponsor. One of these was Rædwald ruler of the East Angles and the other

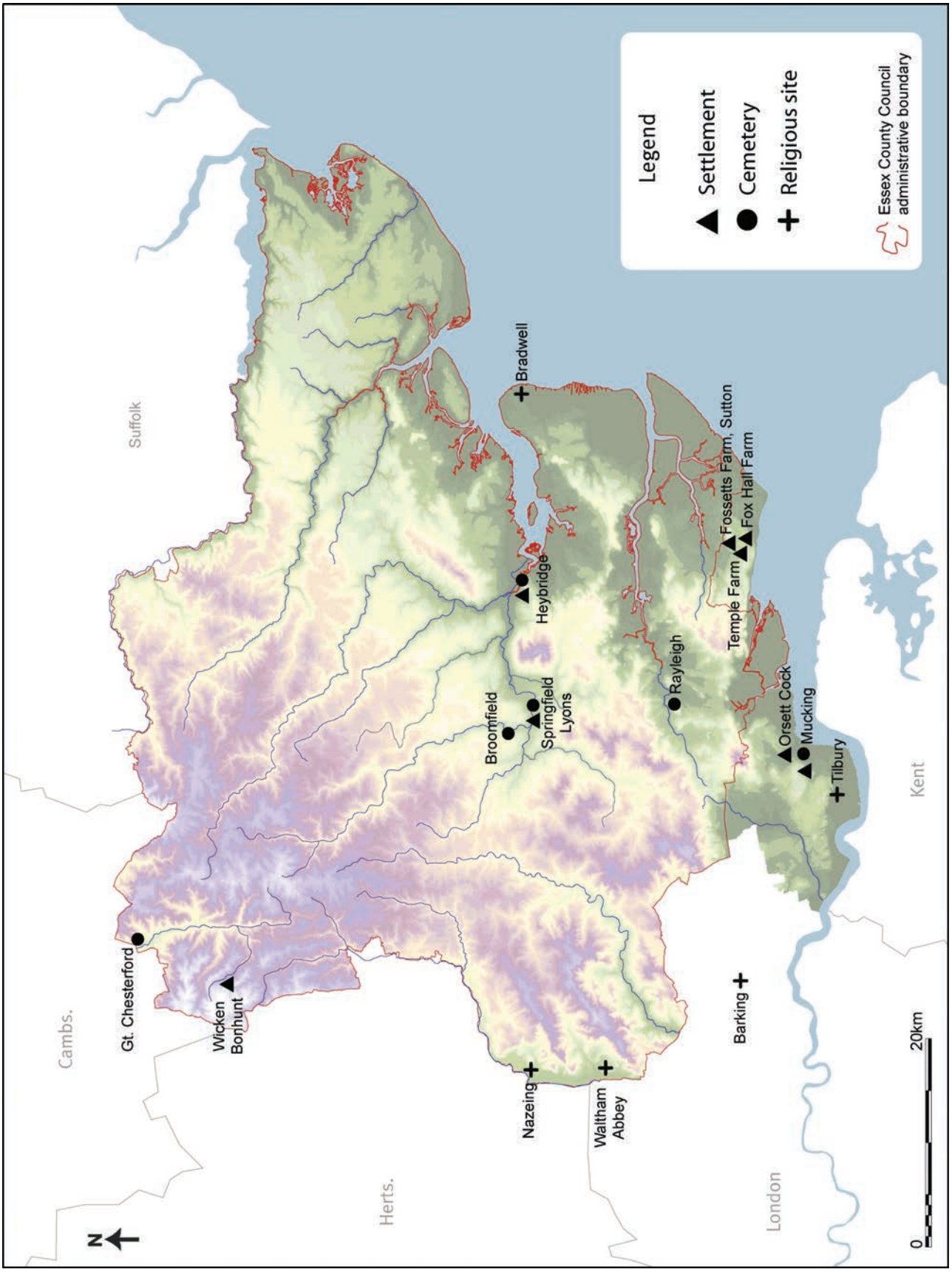

FIGURE 1: Anglo-Saxon sites mentioned in the text (© Crown copyright. All rights reserved. Essex County Council 100019602, 2013)

Saberht king of the East Saxons. Additionally Æthelberht ordered the construction of a cathedral church in London dedicated to St Paul, despite the fact that London was accepted by all parties as under East Saxon royal control (*HE* II.3). A bishop was appointed for London, Mellitus, though he was quickly expelled by Saberht's pagan heirs around 617. Kentish influence did not end with the deaths of Æthelberht and Saberht, however, for Egbert founded a monastery at Chertsey (Surrey) around 666 and the laws issued between 673 and 685 by Hlothere and Eadric refer to a Kentish *sele* (royal hall) in London. Periods of Kentish overlordship over London and Surrey appear to alternate with Mercian and West Saxon phases of influence. By the beginning of the eighth century Mercian control had become firmly established, but both Cædwalla and Ine of the West Saxons were actively involved with Surrey, London and Kent in the last decades of the seventh century. It seems reasonable to suggest then that the three East Saxon kings, who succeeded Saberht and died fighting the *Geuissæ*, did so not in a foolhardy gesture, but because they were seeking to defend their lands south of the Thames from encroachments by the *Geuissæ* (*HE* II.5).

Turning to the archaeology, a recent survey published by the Museum of London makes it clear that there are Early Anglo-Saxon sites regularly spaced along both banks of the Thames, but that north of the river itself, these sites quickly disappear (Cowie and Blackmore 2008, 132–3, fig. 137). Thus there is relatively little Anglo-Saxon archaeology for Middlesex, Hertfordshire and the rest of Greater London north of the proto-urban settlements centred on Covent Garden and the City of London. The contrast with the picture south of the Thames could not be more marked as Hines (2004) has noted. There we find a ring of early Anglo-Saxon cemeteries within a ten-mile radius around the Roman city within Greater London and neighbouring parts of the modern counties of Surrey and Kent. Mitcham and Croydon are the best known of the 'Surrey' cemeteries, while Orpington, Horton Kirby, Darenth and several other cemeteries in the Dartford area, together with Northfleet near Gravesend provide 'west Kent' equivalents. Hines has also pointed out that the successor burial sites in Surrey and west Kent datable to the seventh century match in broad terms the distribution pattern revealed by the fifth and sixth-century cemeteries. There are exceptions, notably the sites at Gally Hills in Banstead and at Farthingdown in Coulsdon, both in Surrey, but in general terms it does seem justifiable to argue that Surrey and west Kent was originally a single region of Saxon settlement. Hines does not take the further step of comparing the west Kent cemeteries with their principal equivalent north of the Thames at Mucking in Essex. Thus, if we can use the presence of fifth-century Quoit Brooch Style metalwork to link the Surrey and west Kent buried communities, we can certainly do the same to link Mucking to sites in west Kent. A Quoit Brooch Style bracelet from Mucking Grave 631 is matched at the recently excavated site at Temple Hill, Dartford. Decorated pottery with zoomorphic bossed ornament links Mucking to vessels from Northfleet, but also to a recent find from Otford near Sevenoaks (Welch 2007, 233). Pottery stamp links, notably stamps of Briscoe's G2bii linked to Riseley in Horton Kirby parish, G2aii to Northfleet, M6ai to Horton Kirby and M6bi to Northfleet reinforce the picture (Hirst and Clark 2009, 596–602, fig. 333). If the placement of Early Anglo-Saxon communities in Surrey and west Kent together with Mucking represented an attempt to provide a ring of defences for London around the middle of the fifth century, then this makes sense if the two main threats were anticipated to be from the east using the Thames and next from the south coast using the Roman road network to gain access to the London basin. In this scenario, the north was clearly not seen as a priority. We will look at the Mucking evidence in more detail below, but there is every reason to believe that west Kent had been East Saxon territory once and had been lost to an expanding Kentish kingdom that gave it its modern name.

Establishing the northern limits of the East Saxon kingdom has proved more controversial. While we can be sure that the historic boundaries with Cambridgeshire and Suffolk had been established before the Domesday Survey of 1085, it is far from clear that the Stour acted as a frontier with the East Angles in the Early to Middle Saxon periods or that the upper reaches of the valley of the Cam formed East Saxon territory in the fifth to sixth centuries. It has been observed more than once that the adult female dress assemblages represented in the Great Chesterford cemetery (Evison 1994) share more in common with their counterparts in south Cambridgeshire (Malim and Hines 1998) than they do with contemporary assemblages from the Essex heartlands as at Springfield Lyons (near Chelmsford) and Mucking (near Tilbury and Thurrock). In addition to Great Chesterford, these are from north to south, an East Anglian sixth-century great square-headed brooch from the Chishill area, sufficient items to imply a fifth to sixth-century cemetery in the Little Chesterford area, nineteenth-century records of iron artefacts from Wendens Ambo and a spearhead found at Henham in 1908. Attempts to argue that East Saxon territories must extend as far north as a natural watershed in Suffolk, which on pre-Roman and early Roman coin evidence is assumed to represent the northern limit of the *Trinovantes* tribe (Dunnett 1975), smack of geographical determinism (Parker Pearson *et al* 1993). Inappropriate arguments based on the presence or absence of particular sixth-century dress fittings in the same published discussion, which sought to demonstrate that the elite burial site at Sutton Hoo might have been created for East Saxon kings (Hills 2010), do not take us any further forward. There are early Anglo-Saxon burial sites on both sides of the Stour, but there is also an absence of much in the way of contemporary sites in the north-east of the county between Colchester and the Stour. It should be possible in the forseeable future to undertake the full electronic mapping of all early Anglo-Saxon burial sites across eastern England and include metal-detector finds recorded through the Portable Antiquities Scheme as well. This will permit us, using GIS technologies, to establish both continuities and gaps in the evidence with a greater sense of certainty. This has already been achieved for Kent (the ASKED database available through the ADS) and for England south of the Thames up to 2007 (Harrington and Welch forthcoming).

ANGLO-SAXON CEMETERIES: MIXED RITE AND CREMATION BURIAL SITES

The publication of the full report on the double cemetery at Mucking in 2009 marked a key point in the Early Anglo-Saxon archaeology for Essex and indeed the whole of eastern England (Hirst and Clark 2009). Although the interpretation of a site in which the skeletal remains had been removed by natural chemical processes obviously presents a challenge,

it has proved possible to provide a remarkably full picture of the two burial communities here. By utilising detailed comparisons with a contemporary cemetery at the opposite end of the Thames valley, in which excellent bone preservation was present, age bands were established for the key artefact types that were associated with sub-adult, male adult and female adult burials within the 'Saxon' cultural region of southern England. This comparator cemetery was located in the upper reaches of the Thames at Lechlade in Gloucestershire (Boyle *et al* 1998). Additionally by utilising the dimensions of the body shadows and coffin outlines revealed in the gravel terrace at Mucking, it proved feasible to suggest age bands for the sub-adult burials and separate them from the adults. The graves themselves were dated by the associated artefacts within a range spanning from the middle decades of the fifth century to the beginning of the seventh century. It proved possible to create a detailed chronology from the inhumation artefact types using a finds seriation package. These objects were successfully phased into a relative sequence that will prove to be an invaluable reference point for cemeteries in Essex, western Kent and Surrey and elsewhere across southern England. Indeed there is a case for revisiting the dating sequences for a number of cemeteries within the 'Saxon' cultural region, including the Springfield Lyons cemetery near Chelmsford (Tyler and Major 2005). Admittedly the electronic package adopted for the Mucking seriation is one that is not favoured by other Anglo-Saxon specialists, who typically prefer Correspondence Analysis. Nevertheless it makes the case for the routine adoption of statistical packages in all future large-scale site or regional analyses of early Anglo-Saxon cemeteries.

The primary importance of the Mucking site is that with its Cemetery II, we have a relatively large and virtually complete burial ground that has been recorded to modern standards. A minimum of 745 individuals comprises 463 cremations and 282 irregularly-oriented inhumations. The most obvious post-burial damage to this cemetery took place with the insertion of timber foundations for a medieval windmill. There was also significant modern plough damage and it can be estimated that in all some fifty or so cremations and perhaps five to ten inhumations have been lost. The opportunity to investigate such a large sample representing a near complete burial community over some 150 years more than justifies the funds spent and the time and effort devoted to its publication. Of course, the partial remains of Cemetery I with its 64 inhumations, but no cremations, do not provide an equivalent full picture, but its burials are broadly contemporary with the second cemetery and deserve equal consideration. By comparison with the continental cemeteries of the Migration and Merovingian periods, in which thousands of burials may be excavated from a single site, this will seem relatively small scale, but by English standards the Mucking cemeteries are highly significant.

Interestingly many of the concepts presented in the first interim publications on Mucking have been revisited here. Anyone who has stood on its gravel terrace and looked eastwards down the length of the Thames estuary is left in no doubt that this is a location of strategic importance. Whoever occupied this site commanded a clear view of all shipping approaching London from the east. Combined with the presence of fifth-century Roman military belt equipment in a handful of graves, representing a significant group of its earliest weapon burials, this location fits the concept of a deliberate settlement of a Germanic war band in the fifth century. We refer to such warriors as *foederati*, men recruited by a formal agreement or *foedus* in the Roman manner. The text of the *De Excidio* attributed to Gildas, implies that related Roman military terminology was in use in fifth-century Britain (Welch 1993, 269). Presumably Mucking was a key settlement linked to others used to guard the eastern and southern approaches to post-Roman London. As argued above, this would imply that there was a British fifth-century political centre in London that has so far eluded us archaeologically. Whatever the origins of the Mucking site, the demise of British authority in London did not lead to the abandonment of Mucking as a settlement. Rather both Anglo-Saxon cemeteries continued to prosper through the sixth century and represent secure and well-resourced populations. As also mentioned above, we need to look at the wider picture along both banks of the Thames. There are broadly contemporary burial grounds on the Kent side with the published reports for the Fordcroft, Orpington site in the Cray valley providing one example and the more recently investigated Temple Hill, Dartford cemetery another (Welch 2007, 230–5). Both sites contain artefacts, including decorated handmade pots comparable to the Mucking finds.

The strategic positioning of the Mucking site commands the point where shipping moving upstream on the tide had to turn first south and then west again at the same time as the estuary narrows markedly at Tilbury to the south of Mucking. Gravesend and Northfleet with its important Anglo-Saxon cemetery lie a bit further upstream with the aforementioned Dartford and Orpington sites located still further west. A key question posed by the new Mucking report is a plausible location for the burial grounds of its settlement population during the seventh to early eighth centuries. The third and last phase of the Mucking settlement complex, its Phase C, is represented by a generally broad scatter of excavated structures, both sunken-featured buildings and halls, in contrast to the more tightly-defined settlement units of the fifth and sixth centuries (Hamerow 1993, 86–9, fig. 50). It is suggested here that the focus of the Mucking settlement may have shifted *c.* 600 southwards towards Tilbury. The control of a ferry crossing from East Tilbury to Kent may well have been a factor. At this narrow point on the river, the chalk subsoil provides a dry natural approach for a land route on both banks of the river. Control of a Higham–Tilbury ferry may have become more significant after the political annexation of what became Kent west of the Medway by the rulers of east Kent at some point in the late sixth century. From *c.* 600 inhumations in west Kent tend to be buried equipped with Kentish-made artefact types and the occasional continental import. Those living along the north bank of the Thames may well have felt under threat. According to Bede the East Saxon king was himself under Kentish overlordship in the early 600s, though this situation was to be contested later during the seventh to eighth centuries. Certainly we can imagine that control of such crossing places on the north bank of the Thames may have become a priority in this period.

It has been noted that there were significantly more cremations than inhumations in the second Mucking cemetery, while a more balanced picture emerges from the Springfield Lyons site (143 cremations to 114 definite inhumations). Interestingly the two most recent excavations of Anglo-Saxon

cemeteries in Essex consisted exclusively of cremations. These are the sites at Rayleigh near Southend (Ennis 2008) and the Chalet Site, Hall Road on the outskirts of Heybridge (Newton 2008). Admittedly there is a question mark at Rayleigh over the status of one context (burial 61). This contained an Anglo-Saxon bead necklace, a copper-alloy ring and an iron knife blade, but the published plan does not seem to provide sufficient space for an inhumation wearing the necklace or accompanied by the other two associated artefacts (Ennis 2008, 15–16, 52–3, figs. 8 and 9). So probably we should exercise some caution here and allow that this assemblage might represent a ritual deposit that did not go through the fire. It is unfortunate that this context was recorded during the evaluation phase and that the subsoil conditions made the definition of any features particularly difficult. Fortunately the subsoil was not problematic at the Heybridge site.

A total of 145 cremations and a further four possible cremations dating to the fifth and sixth centuries were recorded at the Rayleigh site while most of the 66 cremations at Heybridge essentially belonged to same date range. Admittedly one of the Heybridge pots produced comb decoration and is probably datable to the seventh century, but it was not necessarily from a pot that functioned as a cremation urn (Newton 2008, 91–2, fig. 16.55). Additionally there were two timber post structures at Heybridge of types introduced from the Anglo-Saxon continental homelands (Welch 1992, 66–70). One consisted of four and the other of six earth-fast posts and there were also a number of ring-ditches and other related features here (Newton 2008, 75–6, 118, figs. 8 and 10). In both cases we are dealing with sites that begin to be used for burial in the fifth century and continue in use through much if not all of the sixth century and just possibly on into the seventh century.

This emphasis on cremation in the earliest Essex cemeteries may be significant. Firstly it may help to explain why the distribution pattern of Early Anglo-Saxon cemeteries in Essex is relatively patchy. It is harder to miss furnished inhumation burials, whereas farmers have often continued ploughing down through urnfields without realising the damage they are doing. If the Rayleigh-Heybridge cemetery type is more typical of East Saxon cemeteries than the Mucking-Springfield Lyons-Feering type of burial ground, then we should probably be aiming to educate developers and farmers of this possibility. Secondly, the practice of urned cremation is introduced essentially unchanged from north-west Europe together with their associated timber structures to a lowland Britain that had abandoned cremation over a century earlier. The handmade pottery vessels used as urn containers have forms and decoration that belong to specific north German traditions. All the available modern ethnographic evidence points to handmade pottery being produced on a domestic scale by women. If this hypothesis is accepted, then handmade pottery used as cremation containers provide clear indicators of the ethnicity of their producers. Such pottery making skills would have been passed on from mother to daughter and when those daughters married and moved to join their husbands they would have taken their mother's tradition with them to a new community. While it is not impossible that an adopted British daughter might have been taught the same skills, it is probable that in the vast majority of cases we are indeed dealing with the descendents of immigrants. These were the women who had travelled on ships around the North Sea coastline to settle with their men in eastern lowland Britain during the fifth to early sixth centuries. The ambiguities that make it harder to demonstrate the same certainty for those who had adopted inhumation by the time they reached Britain are not really present here. Further research into finger and thumb prints on handmade vessels would be desirable in order to identify the gender of their makers. Similarly the analysis of stable isotopes from the tooth enamel of human remains may assist us in the future interpretation of the issue of migration. For the present, there is still some separation of opinion between those archaeologists who emphasise continuity and processes of acculturation of the native population and those who believe that we have underestimated the scale and the time over which migration took place from the northern Netherlands, north-west Germany and southern Scandinavia. I belong firmly in the latter category, while accepting that some acculturation took place.

SPECIAL BURIALS OF THE SEVENTH CENTURY

There was no particular reason for the Museum of London's archaeological team to anticipate a princely or royal chamber burial at the south end of a known sixth to seventh-century cemetery at Prittlewell within Southend (Hirst *et al* 2004). The impressive timber grave chamber, some four metres square remains a remarkable find (Fig. 2). The chamber contained a coffined burial with two plain gold foil crosses, quite probably originally placed over the eyes as well as a plain gold buckle and two Merovingian gold coins in the waist area. The lack of decoration on the crosses and the buckle strongly suggests that the restraint was deliberate and that they may have been purpose-made for this burial. They are certainly very unusual with gold crosses normally associated with Christian furnished burials on either side of the Alps in this period. While we can relate many of the other finds from the main chamber itself to comparable graves in England and date the burial with some confidence to within the first third of the seventh century, not one of the contemporary Anglo-Saxon graves reveals such unambiguous evidence for the Christian beliefs of the deceased. The suggestion made by John Blair that there were two phases to the burial process here has some merits. This identifies a "private" family Christian burial, which was closed when the coffin lid was fastened down over the specially dressed corpse. Then a "public" and more traditional burial process took place, marked by the deposition of the many items recorded within the chamber and around the coffin. The second phase would end with the laying of the roof timbers over the chamber and its encasement by an earth mound. The extent to which the second event was regarded as a specifically pagan ritual at the time of the burial itself is a matter for future debate. I prefer to use the term traditional here instead. Perhaps each individual who witnessed the burial interpreted the process in terms of their own beliefs at a time of change, in which the impact of Roman Christianity was an important factor, particularly for the political and social elite.

What we can observe is the selection of the same range of items we find in other royal or princely burials in seventh-century England. The inventory of finds recovered in the late nineteenth century from the chamber grave at Broomfield near Chelmsford is much less complete than the Prittlewell assemblage, but it is comparable to the near contemporary

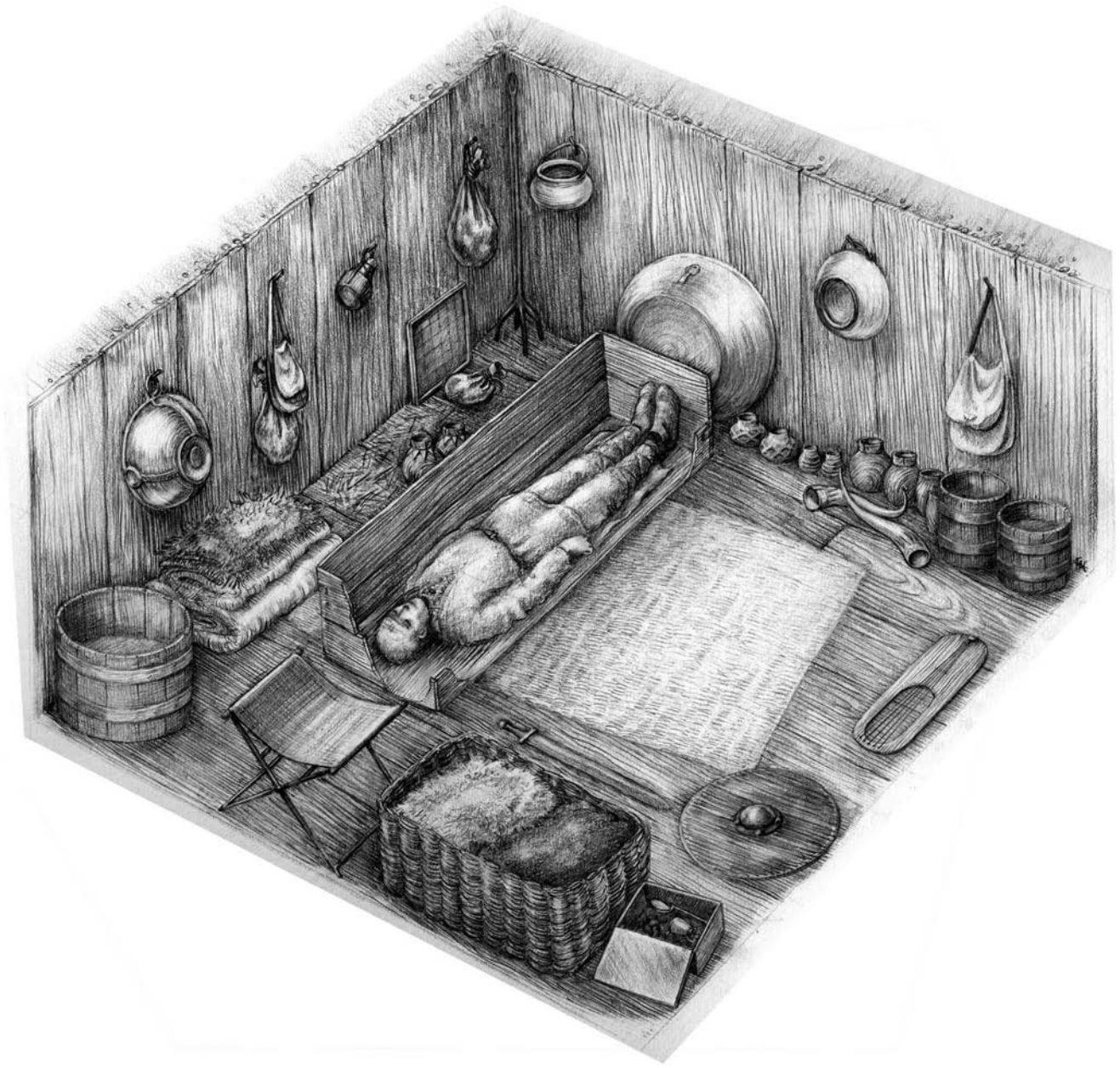

FIGURE 2: Reconstruction drawing of the Prittlewell princely burial © MOLA (Faith Vardy)

records from the chamber excavated under a barrow at Taplow in Buckinghamshire. There is the even grander assemblage from the chamber in the great ship burial at Sutton Hoo in Suffolk excavated in 1939. Iron weapon sets, gold or gilded belt sets, vessels in various materials, some imported from the Mediterranean, for preparing and serving drinks and food, musical instruments such as a lyre and board gaming pieces are amongst the typical contents of such tombs. These items symbolize the role of the deceased as a warrior leader and aristocrat with time to spare for leisure activities, as well as hunting and warfare. He was in particular a generous host, equipped to provide an instant feast for those invited to his hall. Later Anglo-Saxon poetry, notably *Beowulf* describes such a world in Scandinavia and that poem has been analysed in depth by Bazelmans (1999) amongst others. Whether we should attempt to identify the individual buried at Prittlewell as one of the known and named East Saxon kings for this period is quite another matter. Tempting though it is to suggest that he was Saberht, the king baptised at the insistence of his Kentish overlord Æthelberht around 600, we might have expected Saberht to have been buried in London, perhaps at or near the new cathedral dedicated to St Paul there or some other church. In so doing, he would have been emulating Æthelberht's own burial in the monastic church of St Peter and St Paul just outside Canterbury. Of course, the Prittlewell prince need not even have been a member of the royal house or else might have belonged to a minor branch. What we can suggest reasonably is that he was buried at an estate centre that he held, though it need not have been the only such estate in his hands and its choice may simply reflect the fact that he had died there. It is probably significant that his barrow and the associated cemetery could not be seen from the Thames. Instead it overlooked a small stream to the west that ran on northwards to feed a rather larger waterway, the Roach, which in turn is parallel to the Thames and joins the estuary of the Crouch before entering the North Sea.

Relatively well furnished mid seventh-century inhumations are notable for their absence to date from the modern county of Essex. If instead we look immediately west of the Roman city of London within territory under the authority of East Saxon kings in the seventh century, there are recent finds to show what we are missing. Despite the eighteenth-century rebuild of the parish church of St Martins-in-the-Fields with its deep burial vaults to the east of Trafalgar Square, two intact graves from an Anglo-Saxon cemetery have been recorded. One male assemblage produced a silver finger ring, a copper-alloy hanging-bowl of Celtic type and a complete glass palm cup. Significantly there are two glass palm cups in the foundation collection of the British Museum recovered from a stone sarcophagus from the front of the same church (Vince 1990, 14, fig. 6). As a Roman sarcophagus containing an early fifth-century inhumation was excavated at the same time as the recent Anglo-Saxon graves, it seems probable that the glass vessels were either re-deposited in a Roman tomb at some point in time or else were placed in a burial context directly above a Roman stone coffin. The hanging-bowl from the male grave is an important status symbol in the seventh century with another example present at Prittlewell and three in the Sutton Hoo ship burial. The female grave produced three glass beads associated with silver wire rings, a composite gold and glass pendant, two amethyst beads imported via the Mediterranean world and an iron knife. Whilst this female assemblage is not nearly as rich as the contemporary barrow assemblages from Swallowcliffe Down and Roundway Down in Wiltshire (Speake 1989), it is not often that we have access to such burials and the new London find is very welcome. A little further east another rich female burial of the mid seventh century was excavated at Floral Street in Covent Garden. Its contents of a Kentish composite jewelled disc brooch, a few glass beads and silver wire rings are on long-term display in the Museum of London (Malcolm and Bowsher 2003, 27). So we can expect to find more well-furnished mid seventh-century inhumations in and around the manufacturing and trading centre along the Strand known to us as *Lundenwic*.

EARLY TO MIDDLE SAXON SETTLEMENT SITES

While the Mucking site complex excavated by Margaret Jones still provides one of the largest samples in England of a settlement sequence spanning the period between the fifth and early eighth centuries (Hamerow 1993), we have yet to locate and explore another such site on a comparable scale within Middlesex, Greater London or Essex. Publication in detail of the settlement at West Heslerton in North Yorkshire with its proposed specialist 'activity' zones (craft, housing, agricultural processing and higher status) will mark an important addition to the literature here (Powlesland 1997, 111–3, fig. 4.4), otherwise we have to look at smaller scale settlements on sand/gravel sites as at West Stow in Suffolk or on chalk uplands as at Chalton and Cowdery's Down in Hampshire (Welch 1992). The presence and partial exploration of early Anglo-Saxon settlement features on gravel terraces in the vicinity of Mucking indicates the existence of further shifting settlements and we can envisage a series of settlements overlooking the Thames and its hinterlands which we have barely begun to explore. An example occurs at Barrington's Farm, Orsett Cock with some eight scattered sunken featured buildings revealed over a number of years (Milton 1987, 24, fig. 11).

Similarly much further east along the terraces within the Borough of Southend-on-Sea there have been occasional similar indications of Saxon activity, again typically in the form of discoveries of isolated sunken-featured buildings. An example is the sunken-featured building recorded at Temple Farm, Sutton located to the north of Prittlewell (Priddy 1985, 163). It can be questioned whether such structures represent integral parts of individual farmsteads or of farmsteads within a hamlet structure on the Mucking-West Stow model rather than temporary structures used by herders within a transhumance economy or specialist craft activity deliberately kept well away from the permanent residence of these communities. The excavation in 2005 of a sequence of areas on Fossett's Farm (Clements Park) by Wessex Archaeology in advance of a shopping estate has provided an important opportunity to explore the wider context of such finds. This site was immediately west of another isolated sunken-featured building associated with pottery sherds attributed to the sixth century at Fox Hall Farm (Ecclestone 1995, 27–8, 34–5 and 38, figs. 4, 7 and 10). The relatively small Area C on Fossett's Farm produced a single sunken featured building (SFB 916), but the much larger Area D was much more productive, starting with its scatter of three sunken-featured buildings dug into the brickearth, which in turn overlies third terrace gravels. From north to south these are SFB 286, SFB 1125 and SFB 1284. The first of these is located to the east of and outside a set of gullies enclosing a sub-rectangular area. Within this is a line of postholes interpreted as a fence line (feature 820) on the east side, together with a significant number of rubbish and cess pits which are secondary features. Further west and beyond the enclosure, though to the south of ditch 167 is a rectangular post structure with weak corners oriented east to west, *c.* 6.5 by 3.5 metres, which belongs to the standard early Saxon hall type (Building 172). A date range between the fifth and mid seventh centuries would fit our current understanding for such structures. In particular a change-over took place during the seventh century in which foundation trenches replaced the use of individual postholes in such structures, which typically functioned as habitations. It is interesting then that a comparable structure, again oriented east to west with surviving foundation trenches the length of its north and south long walls with dimensions of 6.5 by 4 metres (Building 782) is located towards the southern end of the ditch-enclosed zone. This suggests a Middle Saxon date for the second trench building and fits the trend noted by Reynolds (2003, 110–5) for settlements to be enclosed from the Middle Saxon period. Additionally we have the strong possibility that the earlier postbuilt building is a seventh-century precursor to the trench constructed hall. The preliminary date assigned to the pottery sherds recovered here belongs to the fifth to seventh centuries, and unfortunately there do not appear to be any distinctively Middle Saxon pottery types present. There is a fair amount of environmental evidence relating to crops and animal husbandry and also evidence for craft activity including leather, bone and antler working, weaving and some iron working.

A MIDDLE TO LATE SAXON MINSTER AT GREAT WAKERING

The church now dedicated to St Nicholas at Great Wakering is located on a flat coastal plain facing the North Sea some

distance to the east of Prittlewell. It has recently been identified with the *monasterium Wacrinense* referred to in the *Mildrith Legend* accounts of the foundation of Minster-on-Thanet and also in the *Ramsey Chronicle* (Rollason 1982; Rollason 1989). Two seventh-century Kentish princes, Æthelberht and Æthelred had been assassinated for political and dynastic reasons at the royal *villa* at Eastry in the reign of Egbert (664–73). Compensation to their kin was provided by Egbert in the form of a grant of a substantial estate on Thanet for the foundation of a new nunnery there (Yorke 1990, 34–5; Yorke 2003, 19). Their remains were enshrined as saints before the altar of the "Wakering" monastery in the East Saxon kingdom, perhaps reflecting the close dynastic relationships between the East Saxon and Kentish royal houses. This took place soon after their 'martyrdom' according to the *Historia Regum* text (Rollason 1982, 17). Subsequently, at some date between 978 and 992 the Wakering relics were translated to Ramsey Abbey. By then Ramsey had been reformed as a Benedictine house and the principal excuse for the translation was that Wakering's secular clergy were not able to serve this shrine as competently as a reformed monastic community (Rollason 1986, 38, fig. 16; Rollason 1989, 143, 181, fig. 7.1). As Gem pointed out in 1995, "we know little beyond the existence of a minster" at Wakering and he urged future archaeological investigation to locate the minsters at Tilbury, South Benfleet and Wakering (Gem 1995, 43, 47, fig. 12).

Prior to an area excavation in 2000, well to the east of the church and in advance of an extension of the modern cemetery, there was no archaeological evidence to relate to the textual evidence. Thus the earliest fabric in the church's nave and chancel has been dated to *c.* 1100, though it would certainly prove worthwhile to explore below its internal floors. It is argued by the excavation team that two sections of boundary ditches revealed in 2000 to be oriented east to west had been dug in the Middle Saxon period (Dale *et al* 2010, 194–231). This attribution is based on pottery assemblages in the backfills that suggest an overall date range covering the period 650 to 850. The two ditches were some 120 metres apart and it is suggested that they formed sections of a rectangular *vallum monasterii* or monastic boundary. It is indeed plausible that a north–south ditch linked the two at some point to the east of the excavated area. Less acceptable is the assumption that these ditches extended to the west of the present church, thus enclosing it. There is no necessity to accept such a hypothesis and it may be the case that the ditch system was much less extensive and had an agricultural function instead. Indeed the presence of processing waste from butchery and cereal production in the northern ditch (247), together with the absence of wheelthrown or imported wares from the excavated features does not sit well with a supposedly high-status minster context. We would expect at least some Ipswich ware, possibly also imported wares from the Frankish Rhineland or northern France and also some sceatta coins, but no such items were present. Hitherto Barking Abbey (Redknap 1991 and 1992; Webster and Backhouse 1991, 88–94, no.67a–w) and Waltham Abbey (Huggins 1976) have been the most fully explored Middle or Late Saxon monasteries within the East Saxon kingdom, together with the Middle Saxon cemetery associated with the nunnery at Nazeingbury (Huggins 1978). The pottery assemblages at both Barking and Waltham Abbey certainly do contain imported wares that are missing from the Wakering ditches and there are also sceattas at Barking.

Nevertheless the northern ditch (247) did contain four distinct fills containing pottery and, more significantly for the minster hypothesis, there were also two corner fragments with carved ornament, each representing part of a rectangular block of stone, that had been dumped in one of its secondary ditch fills (context 301). This item of stone furniture probably represented some kind of composite box shrine made up of stone panels fastened together using tenons and sockets, which would belong within the confines of a church (Fig. 3). It is tempting to suggest that this monument had become surplus to requirements once the relics of its Kentish saints had been transferred to Ramsey in the second half of the tenth century. Whether we should leap to the conclusion that this particular monument was commissioned to contain the Kentish princely relics is another matter, for there may have been undocumented additional relics or tombs here. There is nothing in the iconography nor any inscription on this stonework to permit us to assign this monument to a particular saint or other individual. On the larger panel, the dominant feature in stylistic terms is provided by a tightly interlaced snake body with herringbone decoration and the portrayal of the snake's head seen from above. This can be related to sculpture found across Wessex as far east as Hampshire, but also in western Mercia in the eighth to early ninth centuries. Examples with similar serpentine animal heads occur in churches at Shaftesbury in Wiltshire, West Camel in Somerset and Tenbury Wells in Worcestershire (Cramp 2006, 42–8, ill.90, 346–51 and 547; Tweddle *et al* 1995, fig. 10c–e).

The stone at Wakering has been identified as a bioclastic limestone by the British Geological Survey and may have been quarried at Headington near Oxford. If so, then it originated some distance to the east of surviving recorded examples of this stylistic group in the Anglo-Saxon sculpture corpus. Both Headington and Oxford were in territory that was firmly under Mercian control between the seventh and ninth centuries, prior to the post-Alfredian expansion of Wessex in the tenth century. There is a shortage of suitable freestones in south-east England including Essex, and there are no local finds directly relatable to the Wakering sculpture. In a specialist report Plunkett has located these fragments in the ninth century (and certainly not much before AD 800) and Professor Cramp would probably agree with this dating. They could well belong rather earlier, however, perhaps within the second half of the eighth century, if instead we follow Tweddle's arguments. He bases his case in particular on manuscript comparisons with the Stockholm *Codex Aureus* and the St Petersburg (formerly Leningrad) Gospels (see Tweddle in Tweddle *et al* 1995, 37–40). It should be noted that virtually all the remaining Anglo-Saxon worked stone in Essex belongs to the period from the tenth century onwards. The exceptions are the Wakering stones and an impost fragment from Barking Abbey assigned to the late seventh and eighth-century period (Tweddle *et al* 1995, 205–6, ills. 260–2). So it is possible that a sculptor from Wessex or the west Midlands was commissioned to travel to Essex in the later eighth, or perhaps the early ninth century, with a Mercian patron providing the funds. Alternatively a ready-made stone monument of the same period may have been fashioned near the quarry and subsequently transported down the Thames to coastal Essex. Nevertheless, while not

FIGURE 3: Photograph of the carved stone from Great Wakering

improbable, there is no particular context for such an act of patronage at such a date.

What this evidence might suggest is that the primary shrine of the Kentish saints at Wakering was constructed in wood. It was perhaps only replaced a century or more later in stone, possibly involving the encasement of the original shrine. St Cuthbert's wood coffin with its incised images in Durham Cathedral (formerly Lindisfarne) provides one possible model for such a timber shrine *c.* 698 (Battiscombe 1956; Rollason 1989, fig. 2.5). If the late seventh-century shrine at Wakering had been constructed in stone, there is no obvious reason why it would need to be replaced after just a century, other than for changes in fashion. Overall this excavation at Great Wakering has raised many interesting questions. Clearly there is a strong case for further investigation here both within the walls of the parish church and on land around the church as and when suitable opportunities arise.

ELITE CENTRES OF THE MIDDLE AND LATE SAXON PERIODS

It is probably only a matter of time before an opportunity arises in Essex or Greater London to explore a complex of large timber halls to match those published from the seventh-century Yeavering royal *villa* in Northumberland (Hope-Taylor 1977) and Cowdery's Down in Hampshire (Millett and James 1983). The publication of two successive timber halls similarly constructed to those from Cowdery's Down within the walls of the Late Roman coastal fort at Dover provides a near neighbour for Essex. It is unfortunate that the excavator interpreted them as the foundations of timber churches rather than as the great halls of a king or an abbot (Philp 2003, 58; Welch 2007, 203). Prittlewell with its early seventh-century princely chamber grave would be a good place to start looking for such a hall complex within Essex.

Moving on into the Middle Saxon period proper, the key site for Essex remains that at Wicken Bonhunt (Fig. 4), first investigated in 1967 by Hooper and then between 1971 and 1973 by Wade and Rogerson (Wade 1980). Its importance cannot be underestimated and its eventual publication, pulling together a rich array of evidence, will be a significant event. In the absence of any sunken-featured buildings amongst the 28 or more structures recorded, it is the ditch fills that provide much of the artefactual and environmental data, but there were also two lined wells, one of which was radiocarbon dated AD 830 ± 50. The only building to produce evidence of a hearth was Structure V (*c.* 18m by 5m), but it is probable that some other hearths had been removed by plough damage and that a reasonable proportion of the rectangular timber buildings were habitations. A formation of nine posts has been interpreted as a raised granary, in which the grain is stored well above ground level to keep it dry with an airflow between the posts (Structure N). Soil samples taken from contexts of both the Middle and Late Saxon periods provide evidence for wheat, oats, barley, peas and beans being cultivated here.

Livestock remains indicate a clear majority of pigs (600), mostly represented by their skulls or mandibles, followed

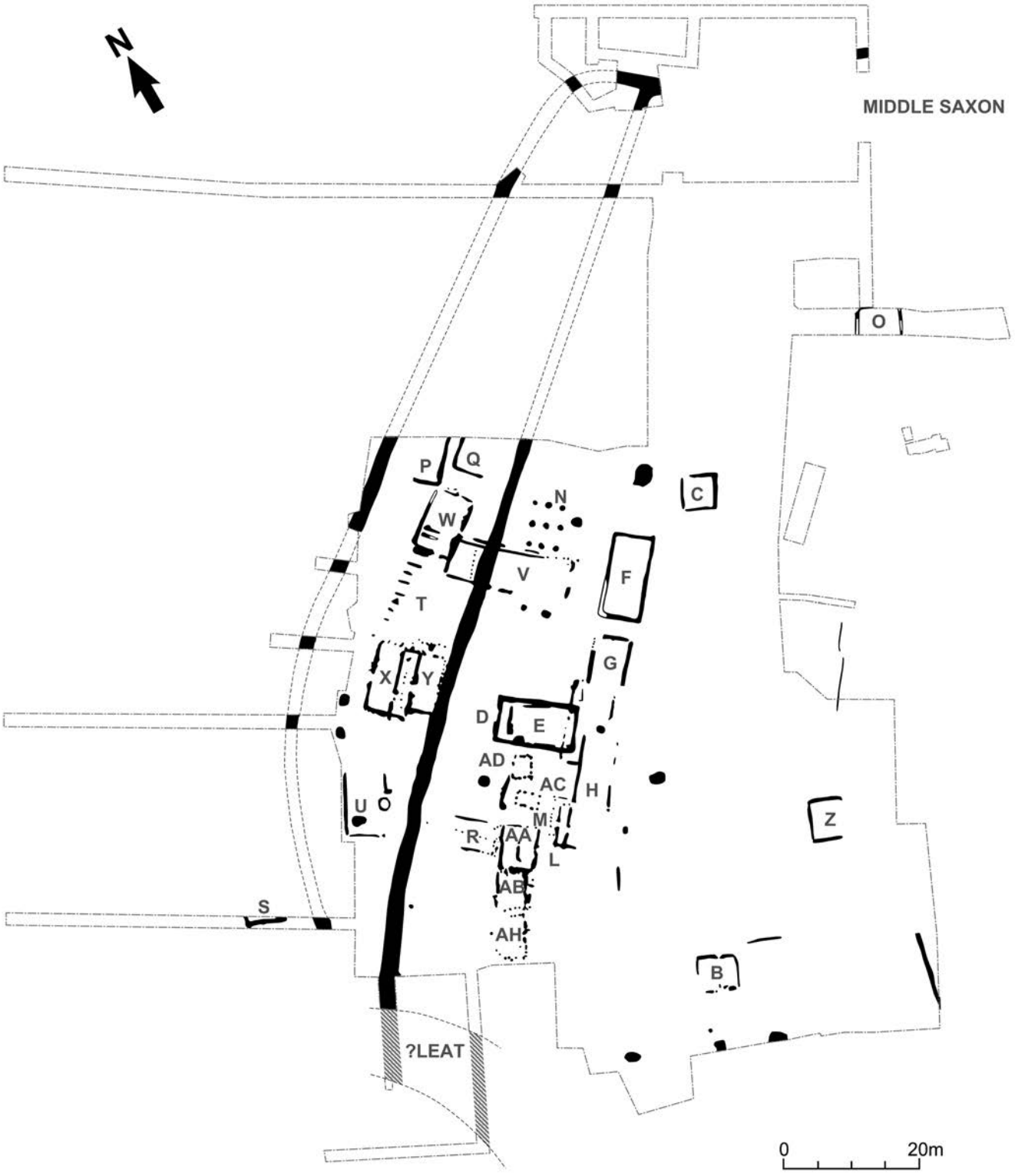

FIGURE 4: Plan of Wicken Bonhunt (from Wade 1980, fig. 38)

by cattle (200) and sheep (100) with few signs of butchery according to the initial assessment by Jones (*ibid* 98). A comparative study of faunal remains drawing on the Wicken Bonhunt data by Crabtree has confirmed the case for an unusual specialisation in pork production here (Crabtree 1996, 65–6, 68–70, 72–3, figs. 2 and 5). The preferred age for slaughtering pigs at both Wicken Bonhunt and the early Anglo-Saxon settlement at West Stow in Suffolk approximates to three years on the basis of mandibular wear, but at Wicken Bonhunt there are also significant numbers of mature and elderly creatures. The ageing data from unfused epiphyses of long bone shafts indicates that 22%–38% of the Wicken Bonhunt pigs were slaughtered in the first year of life, which is considerably more than indicated by dental eruption and wear. The epiphyseal data suggests that the majority were killed between 2 and 2.5 years and only a small proportion were more than 3.5 years old. Crabtree interprets this as indicating that the human population at Wicken Bonhunt was consuming the younger pigs, while the majority of the meat from the older animals was being exported, but with the skulls and

mandibles retained there. Salting of pig and storage and export in barrels to consumer sites implies that Wicken Bonhunt formed part of a broader network of trade in animal products, with some animals being driven to market at the consumer sites. Turning to the cattle, dental evidence from both Wicken Bonhunt and a contemporary settlement at Brandon in Suffolk demonstrates that most of the animals were mature and elderly when slaughtered. They probably included oxen used as draught animals for ploughing among other activities and breeding stock (*ibid*, 66, fig. 3). For sheep, both Brandon and Wicken Bonhunt saw substantial numbers of mature to elderly animals being killed with fewer in their first two years, suggesting an emphasis on wool production (*ibid*, 67–8, fig. 4). Textile production evidence fits in with the presence of sheep at Wicken Bonhunt, but there is also evidence for flax being processed into linen, such as an iron heckle. Thread pickers, spindle whorls and loom weights represent different stages in the manufacture of cloth.

There is additionally the quantity of bird bones represented in the earliest of the Wicken Bonhunt north–south ditches. These represented miscellaneous fowl (295), geese (228), ducks (35), doves (10) and one peacock according to Bramwell, who suggests egg farming (Wade 1980, 98). Certainly there are some interesting patterns here, but Crabtree notes that domestic fowl and goose are common and that they outnumber all the other animals apart from the cattle, sheep and pigs at the Middle Saxon sites she surveyed. There were also significant numbers of ducks from both Brandon and Wicken Bonhunt, with some of the larger Wicken Bonhunt ducks probably representing domesticated breeds (Crabtree 1996, 71–2, Table 1). On occasion large bird bones could be fashioned into simple wind instruments as flutes. These are usually made from the *ulna* of geese or swans, but of the two recorded from this site, one uses a crane's *ulna* instead.

The sequence of occupation was dated to the late sixth or early seventh century on the basis of its handmade sand-tempered pottery, but might well date later to the seventh century as a whole. It is represented by pits and ditches, but none of the excavated buildings were attributable to this phase. A major change of site layout occurred involving the digging of a substantial boundary ditch running north–south. Subsequently this north–south boundary was moved further west and this is seen as indicating an expansion of the settlement. Both of the north–south ditches contained large quantities of Ipswich ware pottery, which is now dated much later than it used to be. So this new site layout can be attributed to within the eighth century. Overall only 20% of the pottery now consisted of local handmade wares as opposed to some 70% Ipswich ware and 10% imported vessels from the Frankish continent. It is this dominance of Ipswich ware in the overall assemblage that might suggest that this unusual site was East Anglian rather than East Saxon. As already noted in this paper, the earlier Anglo-Saxon furnished cemeteries around the former Roman town at Great Chesterford seem to share more in common with their counterparts in Cambridgeshire and western Suffolk than with the classic Essex cemeteries around Chelmsford and Mucking. The *emporium* at Ipswich ought to provide an obvious route for the Frankish imports, but the Wicken Bonhunt assemblages are dominated instead by pottery from northern France rather than by the Rhenish wares typical of Ipswich assemblages. Most of the Wicken Bonhunt imports were burnished grey or black wares, e.g. Hodges' Hamwih classes 13, 14 (group 2 type) and 24, though there is also a rare find of a three-handled pitcher decorated with red paint of Beauvaisis ware (Hodges 1981, 40, fig. 4, 2.3). *Lundenwic* at Covent Garden would be an alternative source of such pottery with their associated Frankish luxury goods and we should not forget the coastal ports of Kent such as Sandwich, but *Hamwic* seems less probable.

The similarities between the layout of Wicken Bonhunt in the eighth to ninth centuries and Period 1 at North Elmham in Norfolk has been noted by Reynolds (1999, 138–40, fig. 61; see also Reynolds 2003, 121–2, fig. 11; Wade-Martins 1980). Here the site was divided into a minimum of two properties separated by a boundary ditch in the eighth to late ninth centuries. The three principal north–south ditches appear to define routes across the settlement. Dating is provided by two sceattas and the radiocarbon analysis of animal bone from the principal ditches ranging from the middle of the seventh century from the eastern major ditch to one centred on AD 740 from a minor ditch in the eastern sector of the excavated site. Dendro-chronological analysis from Well II timbers give a mean date around AD 832. Ipswich ware was relatively rare here however, being limited to 114 sherds from ditches, foundations, pits and wells. A rare imported sherd of Tating ware is recorded from the north end of the central major ditch and belongs to the late eighth or early ninth-century period. Reynolds sees some analogies in the rectilinear layout, the use of ditches and the presence of wells between these two Middle Saxon rural sites and the most comprehensively excavated of the manufacturing and trading *emporia* of the same period, that at *Hamwic* (Reynolds 2003, 122).

It has been argued that North Elmham was the site of an episcopal see of a bishop of the East Angles and it may have been the case that Wicken Bonhunt was attached to a monastery or some other type of Middle Saxon church establishment rather than operating under secular lordship. We are still building a picture of just how common such sites were in the rural landscape of this period. In the absence of distinctive artefacts associated with literacy and writing such as styli or of items bearing religious symbolism, such as have been found at Brandon in Suffolk and Flixborough in Lincolnshire (Webster and Backhouse 1991, 81–8 (no.66), 94–101 (no.69); Loveluck and Atkinson 2007), it is difficult to know how to read the Wicken Bonhunt site.

Following a break in occupation of the excavated areas at Wicken Bonhunt at the end of the ninth century, occupation is renewed here in the eleventh century with four adjacent settlement plots being marked by north–south ditches (Wade 1980, fig. 40; Reynolds 1999, fig. 63). To the east of this new settlement is the small stone church with its distinctive quoining at the corners (Potter 2005, 101–2, pl.2). Now dedicated to St Helen, this may well represent a proprietary church belonging to the lord of this settlement. The site went on in use well after the Norman Conquest in contrast to the other significant settlement for the Late Saxon period within Essex at Springfield Lyons near Chelmsford (Tyler and Major 2005). Although it was tempting to suggest that at least a few of the timber structures were contemporary with the early Anglo-Saxon cemetery here, it is safer to accept that all or virtually all of them belong to a sequence occupation which spans the Late Saxon period. The buildings include three

FIGURE 5: Reconstruction of the late Saxon Springfield Lyons settlement by Iain Bell, © ECC

large timber buildings which are likely to have functioned as the hall of a lord, perhaps a thegn, to use the language of the age (Fig. 5). The largest of these is Building 3, which was 20.8 metres in length and oriented east to west, whose timber uprights were placed in individual postholes. Building 15 is similar in terms of its construction, also oriented east to west, but is substantially shorter with a length of 12.8 metres. On the other hand, Building 18 has its wall uprights placed in a trench and is orientated at right angles to the others being north to south with a length of 13.7 metres. Perhaps more significant are the trench foundations of Building 1 which appears to represent a square multi-storey structure attached to a single-storey building. Taken together with another specialist structure in the form of the putative windmill of Building 17, this settlement starts to look comparable to the thegnly settlement within Portchester Castle in Hampshire (Cunliffe 1976; Reynolds 1999; Reynolds 2003, 129–30, fig. 17). While the Portchester residence was set within a Roman fort, the Springfield Lyons site incorporates a Late Bronze Age enclosure. Timber towers that emulated stone towers such as the well known example at Earls Barton in Northamptonshire are seen as one of the key features of an estate held by one who sought to be recognised as a thegn, with the right to sit on a bench in the royal hall. While we lack the site of a Late Saxon royal centre within Essex, there is no shortage of written evidence for the locations of royal *tūn* sites for Essex and many other shires (Sawyer 1983; Rippon 1996, fig. 2).

CONCLUSIONS

A number of suggestions for future research and fieldwork priorities have been offered in this paper. To summarise, further detailed research drawing on a database yet to be constructed of all early Anglo-Saxon sites in eastern England will be needed if we are to establish the evolution of the northern frontier of the East Saxon kingdom. Secondly, urned cremation may well have been more common than furnished inhumation in this early period and may help to explain why we have so many gaps in the cemetery distribution across the county. High-status settlements and the elite burial sites to which they relate are under-represented and both air photography and geophysical survey techniques could be directed at identifying potential sites. We could also usefully research the documented minster sites of the Middle Saxon period as well as locate the elite settlements that support the secular and ecclesiastical elite. The publication of Wicken Bonhunt should be a priority and we should seek to locate further thegnly settlements to match that at Springfield Lyons.

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'The English Goshen': the archaeology of the medieval and earlier post-medieval landscape

Adrian Gascoyne and Maria Medlycott

INTRODUCTION

In 1996 Jennifer Ward reviewed the progress made in key areas of the archaeology of medieval Essex (Ward, 1996, 129–35), concluding that significantly more field work was required to provide clarity and weight to our understanding and interpretations, and identifying rural settlement as a priority for study (ibid,134). Wade's review of the Anglo-Saxon and Medieval rural archaeology of the Eastern Counties also highlighted the need for a closer and more detailed examination of patterns of rural settlement in the region (Wade, 1997, 52) and, eleven years on, the origins and development of different types of medieval settlement and their associated landscapes remain central questions (MSRG, 2007, 6). The conservation of settlement sites and other elements of the medieval and earlier post medieval landscape that survive into the present also remain an ongoing concern (ibid, 5; Williamson, 2006, 234).

Since the Writtle conference a significant amount of further work has been undertaken, primarily the result of developer funded investigations, but also the analysis and publication of pre-PPG16 excavations, national and regional research and local studies by groups and individuals in the county. These enquiries have increasingly adopted the interdisciplinary approach called for at Writtle (Ward, 1996, 134), exemplified by the large scale fieldwork and documentary research instigated in response to the development of Stansted Airport, which has allowed the development of a detailed picture of a large swathe of the medieval landscape of north west Essex (Havis and Brooks, 2004; Cooke *et al,* 2008). Important steps have also been made towards the sustainable management of our rural historic environment (Gascoyne, 2006).

The purpose of this paper is to provide a review of the work carried out over the last 15 years that has served to address our understanding of the medieval and early post medieval rural landscapes of Essex. It will demonstrate progress in attending to the need to examine medieval settlements and will show how the wider landscape context of these key features has been considered. This paper will also illuminate the advances that have been made in the conservation of medieval sites and their landscapes in the county during the period since the last conference.

THE RURAL LANDSCAPE

The 17th century topographer Norden, in his *Essex Described* (1594), portrayed Essex as the "Englishe Goshen, the fattest of the Lande; comparable to Palestina, that flowed with milke and hunnye." The productive landscape that he described was largely one of enclosed fields, classified by the Tudor antiquarian John Leland as 'woodland' countryside and compared favorably to 'champion' landscapes by the Essex born farmer and poet Thomas Tusser who said that the former had:

"More plenty of mutton and biefe,
Come, butter, and cheese of the best,
More wealth anywhere, to be briefe
More people, more handsome and prest. . . ."

In fact, all but the north western corner of rural Essex, north of Saffron Walden, was of the 'woodland' type and largely remains so today, where it has not been overlain by urban development or transformed by agricultural intensification. It was a rural landscape of scattered settlements, hamlets and dispersed farmsteads and manorial complexes with associated agricultural buildings, windmills and other, low level industrial activity set within ditched and hedged fields of arable, pasture and meadow. These had evolved in many different ways; from ancient planned landscapes that pre-dated the Domesday Book, common-fields which were mostly sub-divided long before parliamentary enclosure and former deer parks and demesne fields that were divided and hedged in the late medieval and Tudor period. Linking the dispersed settlements was an extensive network of lanes, greens, wooded commons and heaths.

Attempts have been made to understand the rural settlement and fieldscape (Bennett, ed., 2011) of medieval and early post medieval Essex using the 19th century 1st edition Ordnance Survey maps. The English Heritage funded Historic Landscape Characterisation (HLC) project was completed in 2006 and a map of aggregated HLC layers (Fig. 1), illustrates the general trends of the fieldscape of the late medieval period. In the north-west corner on the chalk ridge bordering Cambridgeshire and northern Hertfordshire there were classic open field systems, subjected to Parliamentary style enclosure. To the south of this is a swathe of irregular fields, which approximates to the extent of the Boulder Clays. Diagonally from south-west to north-east across the centre of the county runs a band of mixed irregular fields, co-axial fields and former common fields. This band approximates to the interface between the Boulder Clay plateau to the north-west and the sands and gravel layers that overlay the London Clay to the south-east. South and east of here are extensive areas of co-axial fields which merge with the already old system of 'Dengie-form' co-axial fields. The eastern coastal areas were largely marshland.

The drawbacks of HLC have been well rehearsed elsewhere (e.g. Williamson, 2007, 64–71) and in Essex numerous weaknesses can be identified; for example it fails to recognise the many small greens that characterised the medieval landscape of Uttlesford District, and also the former Heaths around Tiptree, which remain invisible because they were enclosed prior to the 1st edition Ordnance Survey map (Bennett 2011). Rather than the 1st edition OS maps, it is the broad landscape depicted on the Chapman and Andre map of 1777, including the extensive fringe of coastal marsh, that is considered to illustrate the county essentially as it would have been in the medieval period (Rackham, 1980, 103; Hunter,

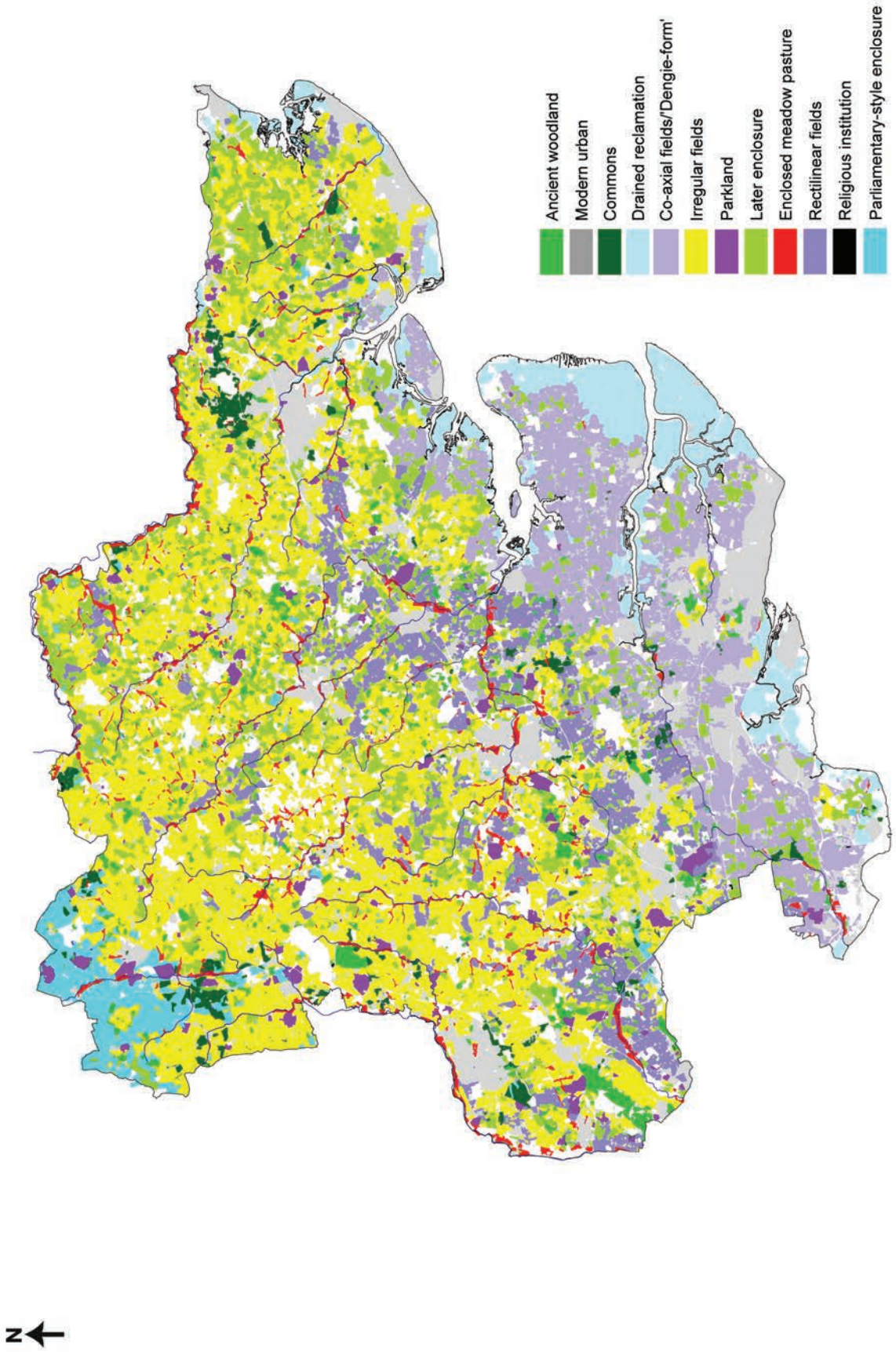

FIGURE 1: Map based on the Historic Landscape Characterisation project depicting the broad field-system trends in Essex. Overall map of Roman Essex © Crown copyright. All rights reserved. Essex County Council 100019602, 2013

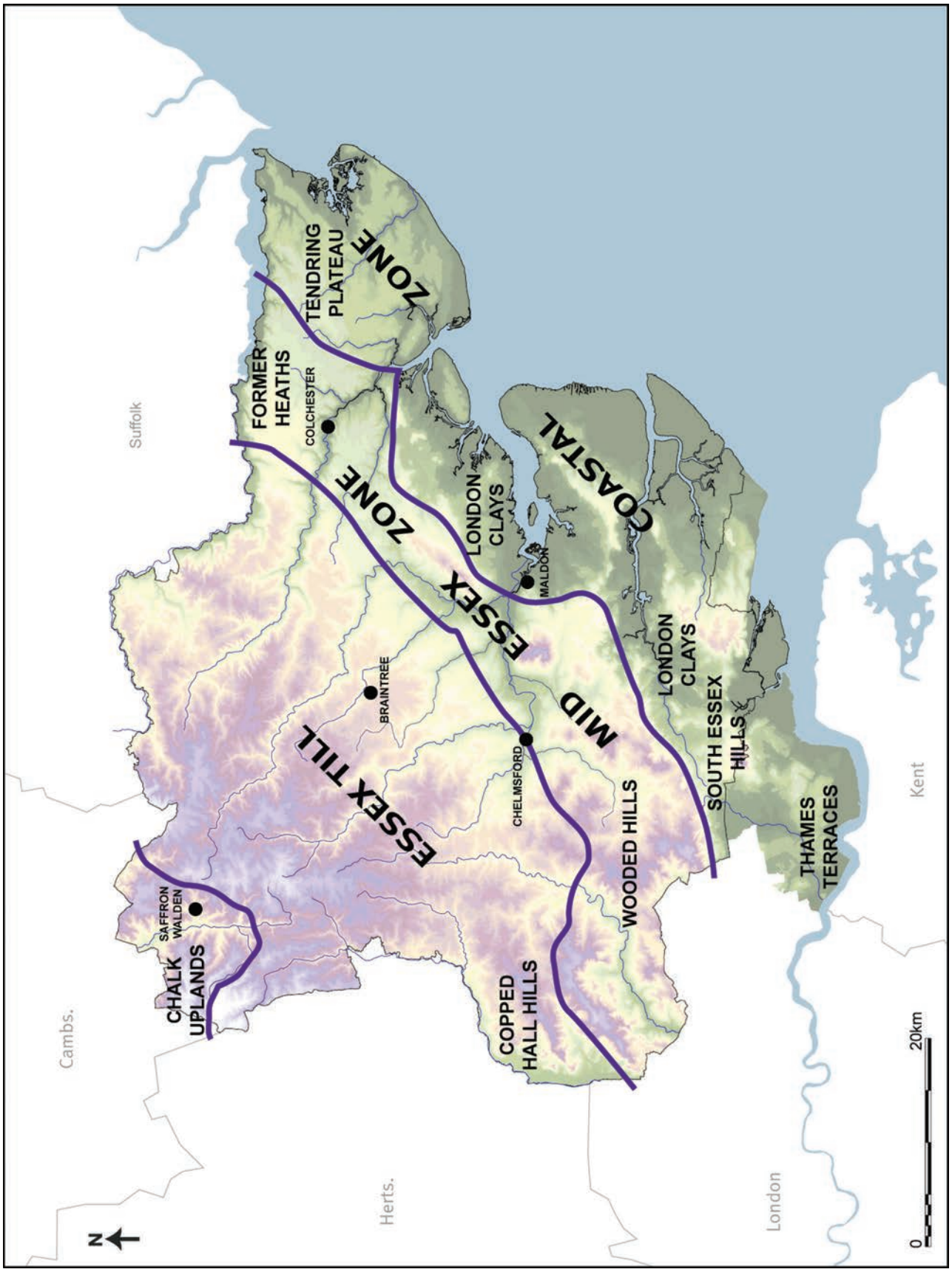

FIGURE 2: The broad landscape zones of Essex (based on Hunter 1999)

1999b, 91). In his seminal work on the Essex landscape, John Hunter identified three landscape regions (Fig. 2) (Hunter, 1999b, 12–42; 1999a), which can be used to provide a general context for the more detailed landscape and settlement studies that have taken place and to enhance our understanding of the diversity of settlement types and the status of their inhabitants (Ward, 1998, 115).

The coastal zone

Using the parish of Hadleigh in South Essex, Stephen Rippon has demonstrated how historic landscape character cannot be understood purely on the basis of morphology alone, and that all components of the historic landscape and the way they articulate with each other must be studied together rather than in isolation (Rippon, 2005, 38–51). At Hadleigh, the medieval landscape was focused around the common with a nucleated settlement adjacent to the church and hall, and probable open fields to the south and east. The south east of the parish was dominated by the Royal manor with a deer park created in the 13th century, arable land and pasture on the marshes for 160 sheep. Beyond this was a 'peasant' landscape, characterised by a series of isolated farmsteads associated with enclosed fields, created through gradual and piecemeal assarting of woodland and heath by smallholders. In the north of the parish were a series of woods held by distant ecclesiastical bodies. The village community was linked to outlying farms and resources, including the woodland and coastal marsh, by a series of droveways radiating from the common. In Maldon District, Historic settlement studies have also allowed the reconstruction of the landscapes of individual coastal parishes (Medlycott, 2001; Medlycott, 2004a; Medlycott, 2004c; Medlycott, 2007; O' Connor, 2007). In Heybridge, at the head of the Blackwater estuary, the extent of the Tiptree common or 'wastes' has been plotted and an extensive network of linear greens identified, together with the 17th century 'purpresture' or roadside enclosures which enclosed them. Extensive areas of meadow have been identified along the valley of the Blackwater, together with marsh bordering the estuary (O'Connor, 2007). Enhanced understanding of an impressive series of cropmark complexes on the north shore of the Blackwater estuary has been attempted in two studies that have considered the results of various archaeological investigations, together with other Historic Environment Record data, particularly aerial photographic evidence, in their wider landscape setting (Wallis and Waughman, 1998; Ingle and Saunders, 2011). Within this area, an historic settlement study (Medlycott, 2004a) has demonstrated that settlement in the parish of Tollesbury comprised a small focus around the church and Tollesbury Hall, combined with a dispersed pattern of individual farmsteads and cottages. The medieval manorial boundaries can be identified, as can a number of medieval farms. The gradual enclosure and drainage of the coastal marshlands is marked by the development of new farmsteads on the border of the marsh. Interpretation of the medieval landscape of parishes on the Dengie Peninsula, also shows farms were located on the marsh edge or linked to it by droveways, confirming the importance of access to the resources provided by the coastal marshes and the open waters beyond (Medlycott, 2001; Medlycott, 2004c; O'Connor, 2006),

The extent of medieval settlement on the coastal marshes themselves has proved hard to establish but Stephen Rippon has used place-name elements to identify a broad division, roughly at Corringham near Canvey Island, in the medieval reclamation of marshland and its associated settlement in the south east of the county and along the Thames. There are two potential settlement-indicative place-names elements commonly associated with the Essex marshes, that is 'cote' and 'wick'. 'Wicks' were dairies, cheese-making sheds and shepherds huts. The name occurs in considerable numbers, particularly in the south-east of the county, but with few examples along the Thames to the west of Corringham. They often lay on slightly raised areas, including on top of Roman red hills. In some cases the individual marshes and sheepwalks took the name of their associated wicks. The term 'cote' appears to have had two meanings in the context of coastal marshes, either as dairy or a raised refuge for sheep or as a salt-producing site, both relating to the seasonal use of the marshes. They are largely found on the eastern marshes of the county. The distribution of names associated with meadows, such as 'mead' and 'ham' are common to the west of Corringham, suggesting local variations in land use. The place-name 'worth' (alternatively 'ward', 'werde' and 'wood') is also common, deriving from the Old English *warod/werod* meaning a coast or bank. They are largely found to the east of Corringham and are mainly 13th century or later in date. It is suggested therefore that they may reflect that reclamation of the marshes occurred rather later in south east Essex than on the Thameside marshes (Rippon, 2000, 204–207).

Archaeology has also begun to contribute to our understanding of settlement and associated economic endeavors around the coastal marshes themselves. At Wallasea Island, construction of a new sea wall prompted an archaeological and historical study that demonstrated the island's origin as a group of small marshland islets, probably embanked in the 13th or 14th century and divided between five mainland parishes due to their importance for sheep grazing. No evidence has been found for settlement before the mid 16th century, when several of the Wallasea marshes supported individual farmsteads (Heppell, 2004). To the east of Wallasea, on the island of Foulness, several seasons of excavation by the Foulness Conservation and Archaeological Society on the site of Great Burwood Farm has identified signs of continuous occupation from the late 14th century until the early 20th century (Bennett (ed), 1999, 229–230; 2000, 217–218; 2001, 259; 2002, 397). On Vange Marsh North, Pitsea, an archaeological desk-based assessment and walkover survey commissioned by the RSPB to inform the development of new reserves in the northern Thames marshes, revealed surviving earthworks of a 17th century farmstead, associated cultivation earthworks and a raised chalk trackway providing access from the adjacent Pitsea Creek up onto the high ground above (Medlycott and Gascoyne, 2006, 36–43). Monitoring of ground works during development of the reserve identified 12th to 13th century activity along an 80 m stretch of buried land surface at the edge of the marsh. Evidence for agricultural activity was found in the form of an extensive carbonised grain deposit indicating arable farming in the vicinity, most probably on the drier land to the north. Several contemporary man-made water channels linked directly to Pitsea Creek are likely to have been used for waterborne transportation of agricultural goods and other commodities and the cutting of replacement channels suggested that the

marshland continued to be actively managed throughout the post medieval period following reclamation (Ennis, 2006). Four kilometers to the south, at Great Garlands Farm in Stanford le Hope, ditches containing 12–14th century pottery, gravel yards or working areas with 16th century occupation layers, a timber barn or granary, and 15th–16th century kiln were found adjacent to a tidal creek (Peachey and Dale, 2005). It seems likely that both the sites at Vange and Stanford le Hope represent outlying parts of farms, established for the processing and storage of farm produce prior to transport by river and ultimately to the markets of London, Essex and Kent (Ward, 1987,100–104).

The Essex Till

On the Essex till, John Hunter used documentary evidence to understand the landscape evolution of a number of parishes (Hunter, 1993; 1995, 133–144; 1997, 151–155; 2003, 15–26) and was able to reconstruct the medieval and later landscape of Cressing, near Braintree. The northern part of the parish was occupied by a small–scale pattern of polyfocal settlement based on linear and focal greens bordered by crofts and tofts, a series of isolated farmsteads that in the 19th century were compact blocks of land and with a predominance of 'croft' field names and nothing in the field boundary patterns to suggest the former existence of open field. In the south of the parish, occupied by the Knights Templar's estate centre at Cressing Temple from early in the 13th century, there were a series of large documented demesne 'fields', although their single ownership precluded them from having been communal open fields. In the north west of the county Hunter studied a number of other parishes principally through their tithe awards and maps (Hunter, 2001; 2004) where he found: evidence for planned common-fields, including very small common-fields based on a few partners holding strips that characterised areas of piecemeal settlement; greenside settlement; individual crofts; discrete farms; primary and secondary manors, some with moats; and woodland. With the exception of Thaxted, demesne land in the parishes was held in compact blocks rather than forming a part of the common-fields, shared with the tenants. In Little Easton, demesne land dominated the parish and at Tilty, the Cistercian monks demesne covered virtually the whole parish (Hunter, 2001). In Roydon, on the Hertfordshire/Essex border a survey of the parish (Medlycott, 2004b) has allowed common fields and meadows, allotted on the strip method to be identified; again these have been largely enclosed, probably in the late medieval period. This form of common field fits the Type 3 Common Field identified in the Historic Fields Systems project (Martin and Satchell, 2009, 22). It has also been possible to recognise those fields which form individual farms; four manor houses and six farmsteads with their origins in the medieval period were identified, together with the demesnes belonging to the manors and in two cases the fields which belonged to the farms.

On the west side of the boulder clay plateau the Stansted Project encompassed large scale fieldwork and documentary research instigated in response to the development of Stansted Airport and provided the opportunity to explore a significant expanse of the chalky boulder clays of the Essex Till and this has allowed the development of a detailed picture of a swathe of the medieval landscape of north-west Essex. The excavations have shown extensive exploitation of the boulder-clay plateau from the 12th to the 14th centuries, with a landscape of dispersed farmsteads, moats and cottages, fields, green lanes, parks, small triangular greens and patches of ancient woodland. Excavations on the Long Term Car Park site at Stansted revealed the remains of a medieval and post medieval hunting lodge, which lay at the centre of a once extensive deer park established in the 12th century (Cooke, *et al.*, 2008, 232). Examination of the later medieval hunting lodge identified a post-built hall surrounded by a rectangular fenced enclosure. This was replaced with a new hunting lodge in the late 15th or 16th century comprising a ditched enclosure and two buildings; a hall and kitchen. The layout bears some comparison to King John's Hunting lodge at Writtle (Rahtz, 1969), although the latter was both earlier and of higher status. In addition to the lodge, a series of ditches to the south of the compound formed three funnels designed to channel deer towards the lodge for 'bow and stable' hunting (Cooke *et al.*, 2008, 249–252). At Lodge Hills, Wormingford in the Stour Valley, investigations by Colchester Archaeological Group have revealed the remains of a substantial Tudor hunting lodge associated with a deer park belonging to Smallbridge Hall, on the Suffolk side of the River Stour (Bennett and Havis (eds), 2007, 190; Bennett (ed), 2008, 197). Other medieval and early post medieval parks on the Essex Till, which have received attention over the last 15 years, include those of Little Easton parish (Hunter, 2001), Pleshey, Absol and The Leighs parks (Hunter, 1994a; Hunter, 1994b; Hunter, 2003, 26–29) and the Little Park at Castle Hedingham (Liddiard and Wells, 2006). An overview of the 16th and 17th centuries was given at the 1996 Cressing Conference on the Essex Landscape (Andrews and Ryan, 1999) and, the Essex Gardens Trust has now completed comprehensive inventories of the parks in Braintree, Epping and Uttlesford Districts (Essex Garden Trust, 2002; 2006 and 2008).

The mid Essex zone

Despite the significant number of medieval and post medieval parks located within the mid Essex zone, historic landscape analysis has been limited, with an historic landscape survey of Writtle Forest and Deer Park (Bannister and Bannister, 1993), Pat Ryan's multi-disciplinary study of Woodham Walter Hall (Ryan, 1999), and an historic landscape survey of nearby Danbury Park (Felus, 2006), exceptions to this. In fact, in comparison to the coastal zone and the Essex Till, the mid Essex zone has been relatively neglected in terms of archaeological work and historic landscape analysis for all aspects of the rural landscape of these periods. The parish of Ingatestone was included as one of the case studies for the East Anglian Fields project, which revealed a fieldscape of core and detached block demesne and groups of small to medium sized hedged fields, clustered around the individual farmhouses (Martin and Satchell, 2009, 151–159). In the parish of Writtle, John Hunter reconsidered Ken Newton's earlier work and detected the same two-fold division between an area of large arable demesne of the Royal Manor and a zone of polyfocal peasant farming, as identified at Cressing and Hadleigh (Hunter, 1995, 140–1; Rippon, 2005, 38–51). In addition, the parish had a third zone in the south comprising parks, commons and extensive woodlands located on poorer acid soils. Excavations in advance of the new A130 revealed a medieval landscape consisting of scattered farms, with the

occasional larger manor house. The distribution of farms was found to follow a common pattern with the larger farms occupying isolated sites and smaller farms set close to the roads The existence of fine wares on most of the occupation sites was taken as evidence that the owners were of middling status and at least one farmer in the area was supplementing their income by running a windmill (Dale *et al.*, 2005, 52).

FARMSTEADS

Rather more progress has been made on the investigation of individual elements of rural settlement patterns in Essex. Since1993, the excavation of over twenty two rural sites in the county have been reported on. These vary in type from high-status sites such as manorial complexes, farmsteads of middling status and individual peasant dwellings (Medlycott, 1996, 176). In some instances it has been possible to reconstruct the excavated farmstead sites within their demesnes or farms and the wider farmed landscape, using cartographic and documentary sources to supplement the excavated evidence. In addition to this, a number of industrial sites including windmills and pottery kilns have been examined.

High-status sites (Fig. 3)

At North Shoebury, in the south east of the county, a substantial ditched enclosure dated to the 12th century and located immediately to the south of the 13th century parish church was excavated (Wymer and Brown, 1995). The size of the enclosure, proximity of the church, and food and pottery waste from the ditch fills was suggestive of feasting are taken to indicate a high status. Traces of a bank and rampart suggest that the ditch may have been intended to be defensible and it would certainly have added to the sites prestige. The site is presumed to be that of the original manor house, part of a church/hall complex, located either side of a lane leading to the road from Shoeburyness. The enclosure was abandoned in the 13th century and the site of the manor house moved a short distance to the west before being superseded by a Tudor hall built on top of it (which was burnt down in 1964). This later hall had an associated garden enclosure and a 16th century barn which survives. North Shoebury is fortunate in having a map of the demesne dating to 1703 which shows the church/hall complex, a thin scatter of dispersed settlement bordering the main roads and evidence for common-fields, farmed on the strip method. These had been largely enclosed by the end of the 16th century, but the evidence survives in the map and earlier documentary sources.

At Southchurch Hall, near Southend, which has its origins in the 12th century, the moat and the late 14th century hall are still standing. The gatehouse, adjoining chamber, bridge, chapel and kitchen, were excavated within the moated area. Documentary evidence indicates that the moated enclosure also contained a brewery, dairy and cider-house. To the north of the moat were the outer court and barn court. Within the former were the cow shed, sheep house, poultry house, cart shed whilst the barn court had three barns of varying sizes, stables, granary and dovehouse (Brown, 2006). The basic layout of Southchurch Hall is broadly paralleled by the plan of the excavated moated manorial enclosure at Low Hall, Walthamstow (Blair, 2002) where an almost square moat dating to the 14th century, contains a hall house with service wing and a separate kitchen range together with stone built bridge abutment serving a timber trestle bridge. The house was subsequently extended by the addition of a further wing, and a gatehouse adjoining the bridge. A further cross-wing was added in about 1500. The medieval house was systematically dismantled in the 17th century and a new house constructed on the north western side of the enclosure. Farm buildings were sited outside the moated enclosure and there were post-medieval records of an associated warren and fish-ponds which were probably medieval in origin. It is known that Low Hall held great stretches of enclosed arable and meadow, as well as some strips within the parish three-field system.

In the north east of the county, the Gutteridge Hall moated site known from 13th century documentary evidence was partially excavated in advance of the construction of the Clacton–Weeley By-pass. A timber framed thatched barn had stood next to the site until 1983, when it was destroyed by arson. Up to five different phases of moat layout were identified, the earliest defining the original medieval complex when it enclosed a timber-framed building with hearth dating to the 12th/13th century. The excavation showed a systematic enlargement of the hall and moat from the 12th century onwards. The northern arm of the moat was extended westwards and to the south of the original medieval building a substantial brick building dating to the Tudor period was constructed. This was demolished in the 17th or 18th century and the moat became part of the garden for a new hall located to the south (Wade and Havis, 2008, 10–56).

At the other end of the county, investigations in advance of the construction of the Channel Tunnel Rail Link excavations at Stonehouse Corner in West Thurrock, revealed the remains of a large stone building, originating in the mid 14th century at the latest, but with evidence of an earlier timber phase from at least the mid 11th century (Andrews 2009). Although the precise layout and size of the earlier building phase(s) could not be confirmed, associated evidence demonstrated an adjacent enclosure containing numerous pits and other discrete features including a well. The stone built phase originated with a south-facing large rectangular 'hall' measuring approximately 30m by 11m. There were a number of additional building phases throughout the remainder of the medieval period and into the early post medieval period, including extensions on three sides. At its greatest, the building complex extended c.50 m east–west and 25 m north–south. Documentary research subsequent to the excavations revealed that the site was the manor house of the Manor of West Thurrock from at least the early 14th century, the earlier remains indicating that its importance extends even further back into the Norman period.

Other opportunities have been taken to examine high status sites around the county that are still in occupation. At Heybridge Hall, Heybridge, excavations ahead of a residential development revealed pits and the remains of a series of foundation slots and associated post holes marking the outline of timber structures related to an earlier, 12th to 13th century, phase of the hall (Bennett (ed), 1999, 220), and in Great Hallingbury, monitoring of ground works for new house plots close to the former Hallingbury Place, found elements of a possible in-filled moat to an earlier (pre 1550s) hall (Bennett (ed), 2002, 399).

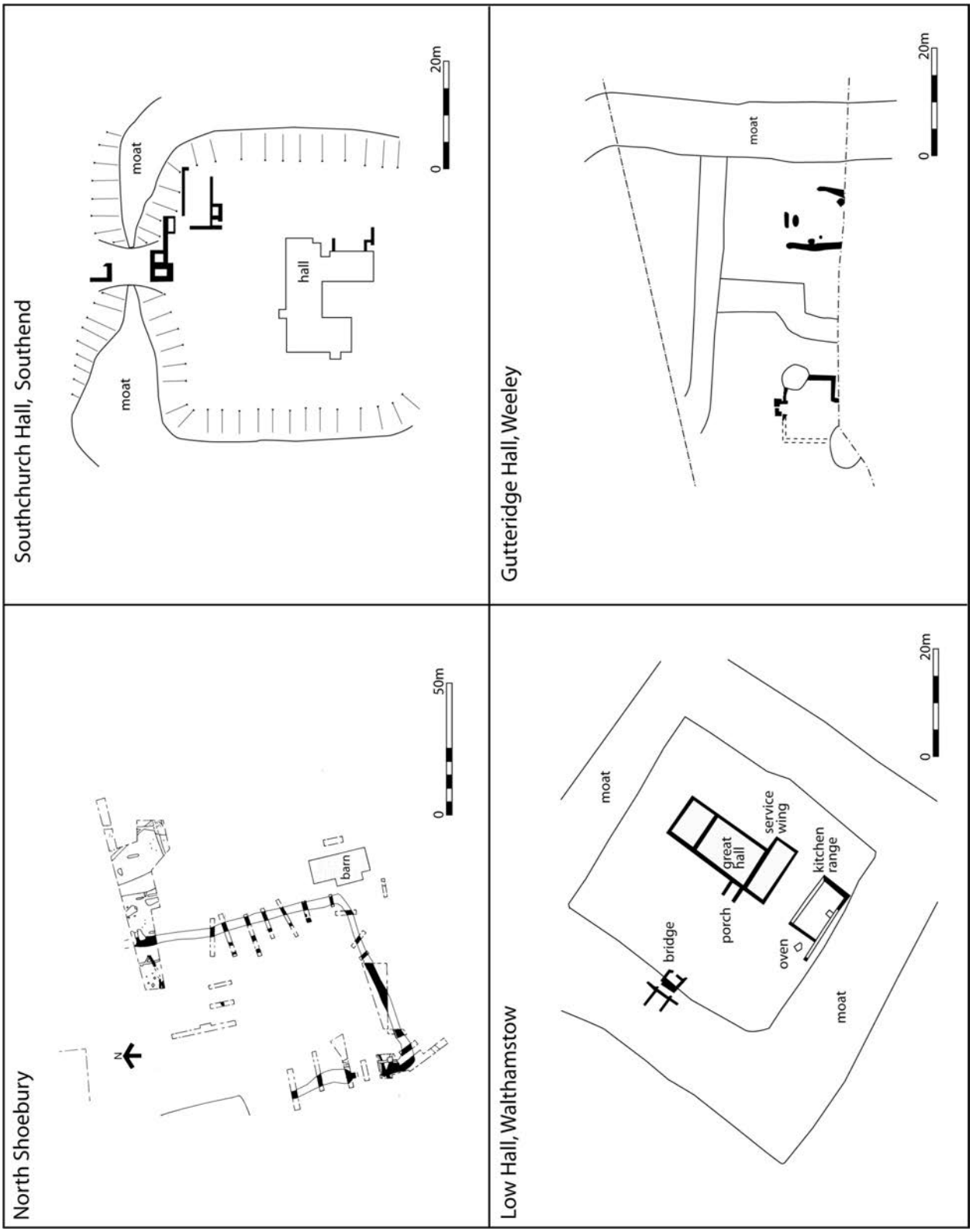

FIGURE 3: Excavated high-status sites in Essex

It is evident from the excavated and documentary evidence, that high status sites comprised multiple structures and that there was also differentiation between the status accorded to different buildings. Those directly associated with the habitation of the site, such as the brewery and bake-house are located close to the main dwelling. The agricultural buildings which most closely reflect wealth and status of the owner, such as the principal barns, stables and dovecote are grouped together and adjacent to the habitation, whilst the lesser barns and stock-sheds are further away. Manors such as North Shoebury were enclosed by deep ditches and probably palisades, long before moats became fashionable in the early 13th century.

Middle-status sites (Fig. 4)

Nine middle-status sites have been excavated, all consisting of a self-contained rural unit, with a number of buildings performing specific functions (house, kitchen, barn, byre). Medieval tenurial documents use the term messuage or tenement to describe the dwelling-house and out-buildings, as well as the farmyard in which they stood. Where the out-buildings were listed in the documents, there were usually two to five buildings including the dwelling-house, often a separate kitchen and then most frequently barns, stables, brew-houses and granaries (Poos 1991, 74–5).

One of the most extensively excavated middle-status sites was the farmstead at Stebbingford, Felsted (Medlycott 1996), which comprised four buildings, though only three were in use at any one time. These were interpreted as a kitchen, an animal byre, a two-roomed building, possibly the dwelling-house and a cellared building. The site dates to the mid-12th to the mid-14th century. Sufficient was excavated of the site to enable a reconstruction of the field-system to be undertaken. The farmstead was set about 100 m to the south of the main road from Dunmow to Braintree and accessed by a ditched trackway. A farmyard area next to the buildings was defined by ditches and there was evidence for either a garden or fruit-growing on a sandy slope next to the farmstead. Four or five linear ditched fields run at right-angles from the road back to the farmstead, these were modified over time with the introduction of smaller paddocks and the removal of a number of field boundaries to increase the size of the fields.

The 13th century farmstead at Boreham Interchange, Boreham (Lavender 1999) was located adjacent to the main route between Chelmsford and Boreham. It consisted of a complex of three closely grouped buildings. The most substantial building was 13m long by 6m wide and was post built with a drainage ditch around it. The structure may have had a raised floor and served as a granary. At one end of this was a second building 10 m x 6 m consisting of gullies for sleeper beams with wattle walls, with a central line of posts. The building contained a hearth and may have been a kitchen. The third building also contained a hearth and the presence of two further hearths and an unusually high number of chimney pots on the site suggested the existence of other out buildings. Ditches and gullies were found associated with the buildings. At Boreham Airfield (Clarke, 2003) excavations in advance of quarrying revealed a 12th to 13th century moated enclosure containing a number of contemporary buildings interpreted as: a domestic dwelling, outbuildings, granary, possible barn and a windmill. The main building measured 15 m by 7 m and was divided into two bays, of equal size, by an internal partition. An annexe at one end was of similar size to one of the internal bays but appeared to be open on one side suggesting a different function. The outbuildings that adjoined the main dwelling were less substantial, both in size and construction, although all these buildings had post in trench foundations. The raised granary comprised a 5 m square structure of four posts; other features associated with the moated enclosure included three ponds and a complex of ditches that may have been a paddock, garden or even another building, such as a barn. The pottery from the site was representative of a household assemblage, and there was little from the finds to suggest that this was a high status site, although the presence of non-local fine wares may have indicated additional affluence (ibid, 77).

The medieval site at Maltings Lane, Witham (Robertson and Davis, 2004) excavated ahead of a housing development, comprised a series of enclosures pre-dating 1200. One of the enclosures contained a gravel surface, and a corn-dryer in what was interpreted as an area used for preparing cereals and the butchery of animals. In the 13th to 14th century the main enclosure was remodeled and two buildings constructed. One, measuring 6.5 m by 13 m, was built with a post-and-beam foundation and was tentatively interpreted as a small barn. The other, measuring 21 m x 13 m and constructed using a ground beam-and-post frame with at least two internal partitions, was interpreted as a dwelling house with possible stock accommodation at one end separated by a narrow hall or passageway. An extant farm building containing elements dating to the 16th century and situated 100 m to the east of the excavated site may represent the next stage of occupation along Maltings Lane.

At Shotgate farm on the A130 (Dale *et al.,* 2005, 26–28), a series of enclosures was established and modified during three broad phases of occupation. In the 11th to 12th centuries, the site consisted of three separate enclosures, two of which contained structures; a post built structure measuring c.6 m x 10m with associated refuse pits and another structure, possibly an agricultural building, surrounded by a number of pits. In the 13th/14th century a large enclosure was added. This probably had an agricultural use as suggested by the addition of a shallow pond. Remodeling of the enclosure layout continued in the 15th century but the site appears to have fallen into disuse in the 16th century. The presence of a ceramic aquamanile was taken as evidence for the relative affluence of the sites inhabitants (ibid, 47). A kilometer to the south, at Dollymans Farm (ibid, 35), excavations revealed three or more phases of activity centered on a large rectilinear enclosure c.80m x 75m. During the earliest phase, between the 11th and 12th century, the enclosure contained a post built, rectilinear structure, 4m x 5m, formed by four post holes, which is likely to have been an agricultural out-building. One or more further structures may have been represented by a number of post holes and gullies. The enclosure was modified and sub-divided during the 13th century but the centre of habitation could not be firmly identified and occupation had ceased before the end of the 14th century.

Roundwood at Stansted Airport (Havis and Brooks, 2004, 380–390) consisted of four buildings, separated by a series of drainage ditches. These were interpreted as a barn, two-roomed dwelling, kitchen and a fourth building of which only

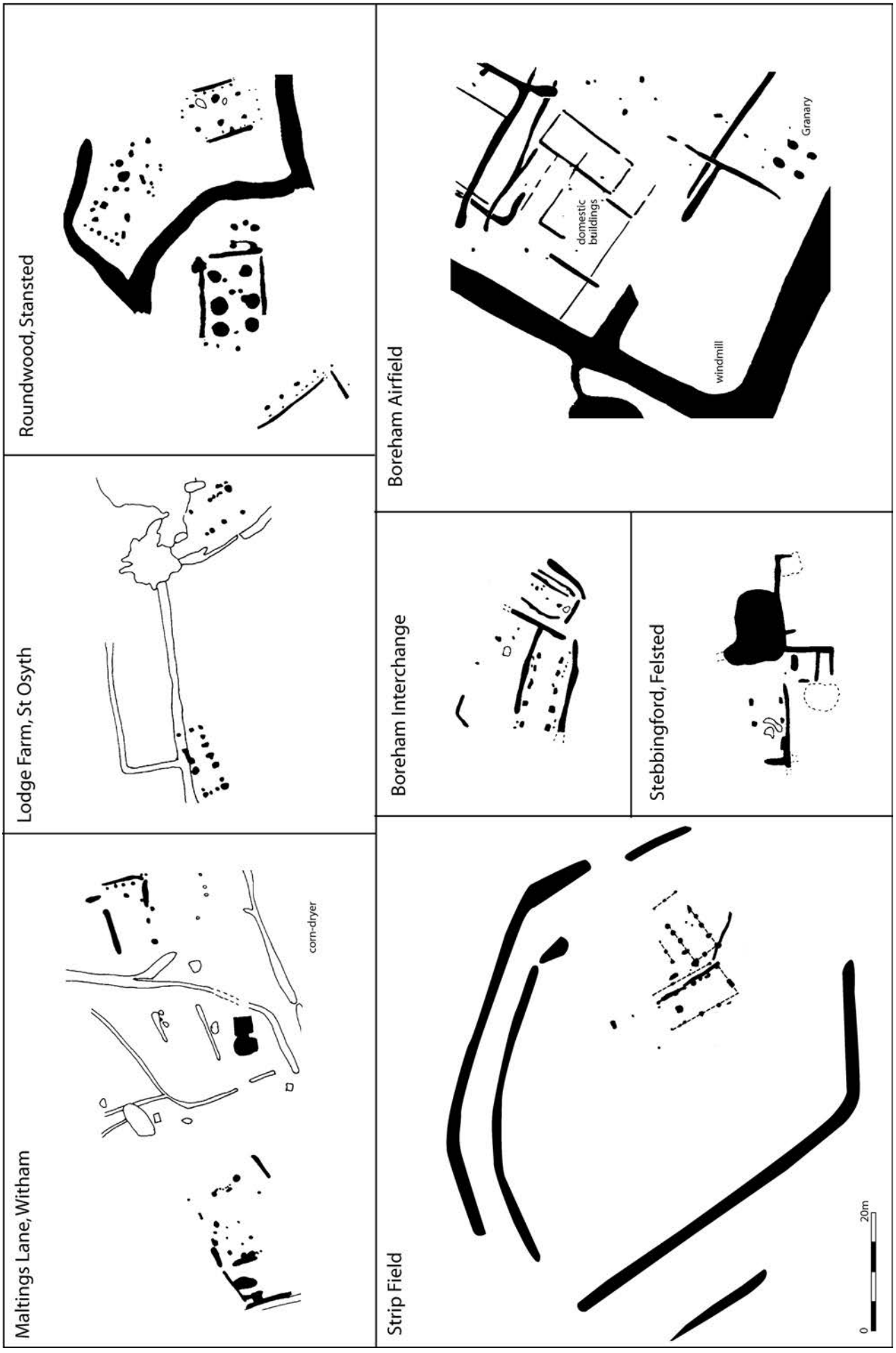

FIGURE 4: Excavated middle-status sites in Essex

a portion survived. The site dates to the second half of the 13th century and was abandoned by the beginning of the 14th century. On the FLB site, Stansted Airport (Cooke *et al,* 2008, 216–217), limited excavations revealed activity dating from at least the 13th century, with the earliest features including a cobbled road, the remains of a building and a series of pits and ditches. The quantities of pottery and other domestic waste recovered indicated to the excavators that the site was that of a small settlement of some affluence (ibid, 217). Similar activity continued on the site into the 14th and possibly the 15th century with evidence for domestic settlement in the form of two buildings, defined by areas of neatly laid cobbling and associated ditches and pits, some of which may have served an industrial function. Again, the high-status domestic artefacts found in association with the buildings suggested relatively wealthy inhabitants and the excavators concluded that the site may have formed part of the core manorial structures of the manor of Bassingbourne in which it lay (ibid, 219). Excavations at the Mid Term Car Park site (ibid, 199–201) uncovered a settlement in what was thought to have been one of the first areas of woodland cleared in and around the manor of Bassingbourne. The farmstead consisted of two large timber halls set within a diamond-shaped ditched enclosure dated from the mid-/late 11th century to late 12th century. The two buildings were of similar form and size, approximately 12 m by 5 m and their layout indicated that they were in use at the same time. One had a central hearth and appears to have been predominantly domestic in nature, whilst the other had no hearth, which together with a lack of early medieval pottery was taken by the excavators to suggest that they formed part of a complex, with the second building used as a barn for domesticated animals or for crop or tool storage. Beyond the compound further evidence for 11th and 12th century activity took the form of a cluster of well dated pits containing butchery waste and two poorly dated field systems (ibid, 202). There may have been some overlap between the farmstead and an adjacent post mill that was built in the late 12th or early 13th century (ibid, 210).

Low status (Fig. 5)

A number of low-status sites have also been identified consisting of single buildings, most of which probably combined the role of dwelling and animal shelter, whilst a few could have been isolated sheds or barns. At Great Holts, Boreham, a single building measuring c 4.25 m by 10 m with two rooms and a possible cross passage, dating from the 10th to early 13th century, was excavated (Germany, 2003). Charred crop remains were recovered from the medieval long house which could have been set within a ditched enclosure, possibly used as a croft. The long-house form may imply that the building was occupied by a bonded-tenant tied to one of the nearby manors (ibid, 225). The Buxted chicken-factory site, also in Boreham (Foreman, 1997) consisted of three small rectilinear tofts, adjoining the main London–Colchester road. A hearth was excavated and occupation debris found, but no trace of a building although there was space for one around the hearth. The presumption is therefore that the building was either constructed on cill-beams resting on the ground surface or of clay lump. Further south, excavations of the Downhouse Farm site along the A130 revealed a post-built building measuring c.11 m by 5 m with a likely construction date of around the 11th to 12th century. There were a limited number of associated features present in the area including a parallel ditch containing a fragment of chimney pot which may have come from the building (Dale *et al.,* 2005, 19).

At Duckend Farm, Stansted Airport, the medieval building consisted of a single structure set within a ditched enclosure (Havis and Brooks, 2004, 368), of mid-12th to 13th century date. The building at Molehill Green A, Stansted Airport (Havis and Brooks, 2004, 374–5), was a more uncertain structure, consisting of a small D-shaped enclosure, possibly representing an eaves-drip gully around a building with an internal hearth. There were two possible lean-to sheds attached to the main structure. The site had been dated to the late 13th century. The Takeley site (Mayo, 2006) consisted of a roughly rectangular setting of post-holes, beam-slots and a pit probably formed part of a farmstead building, dating to the 12th to 13th century. At nearby Priors Green, a four post structure may have been part of a building such as a barn set within a ditched enclosure (Bennett (ed), 2006, 166). At the Blatches site, on the A120 trunk-road, a small rectangular building dating to the mid 13th century and measuring 10 m by 5 m with an associated yard was bounded by a ditched enclosure. The settlement appears to have moved a short distance during the late 13th century with the construction of a second building (Timby *et al.*, 2007). Outside the village of Sturmer in the north west of the county, excavations ahead of construction of the Haverhill bypass revealed a series of 13th century medieval ditches overlain by a single rectangular structure thought to have been used for some temporary agricultural purpose. This was evidenced by twelve shallow post holes or pads measuring approximately 10 m by 20 m (Abbott, 1998, 296). At Molehill Green C, Stansted Airport (Havis and Brooks, 2004, 377–80) a possible moated site with associated domestic debris dated to the 13th–15th centuries was examined, although no buildings could be identified and a probable sequence of fence lines dividing the interior of the moated platform may indicate that it served more of an agricultural function, perhaps as an outlier to Waltham Hall Farm situated nearby.

SETTLEMENT CHANGE

Previous evidence for the widespread phenomenon of the abandonment and shrinkage of rural settlements in the 14th century has been reinforced by investigations over the last 15 years, but, the quantity of work needed to begin to indicate variations in this phenomenon across the county still hasn't been achieved (Ward, 1996, 131). North-west Essex on the Essex Till is one area where a pattern of the cultivation of marginal land in the 12th and 13th century and its abandonment in the 14th century is emerging (Mayo, 2006, 197). At Newmans End near Harlow, an area at the northern end of the hamlet with settlement activity dating from the 11th century appears to have gone out of use during the 14th century (Guttman, 2000, 31). Elsewhere on the boulder clay, some of the smaller settlements, such as the Round Wood and Molehill Green sites, at Stansted went out of use by the late 13th century (Havis and Brooks, 2004). Neither the windmill on the Mid Term Car Park site at Stansted (Cooke *et al.*, 2008, 210) or at Clobbs Mill on the A120 (Timby *et al.*, 2007) appear to have survived beyond the 14th century. Elsewhere along the A120, the farmsteads at Stebbingford (Medlycott, 1996) and Blatches (Timby *et al.*, 2007, 184) were abandoned during the 14th century. In the

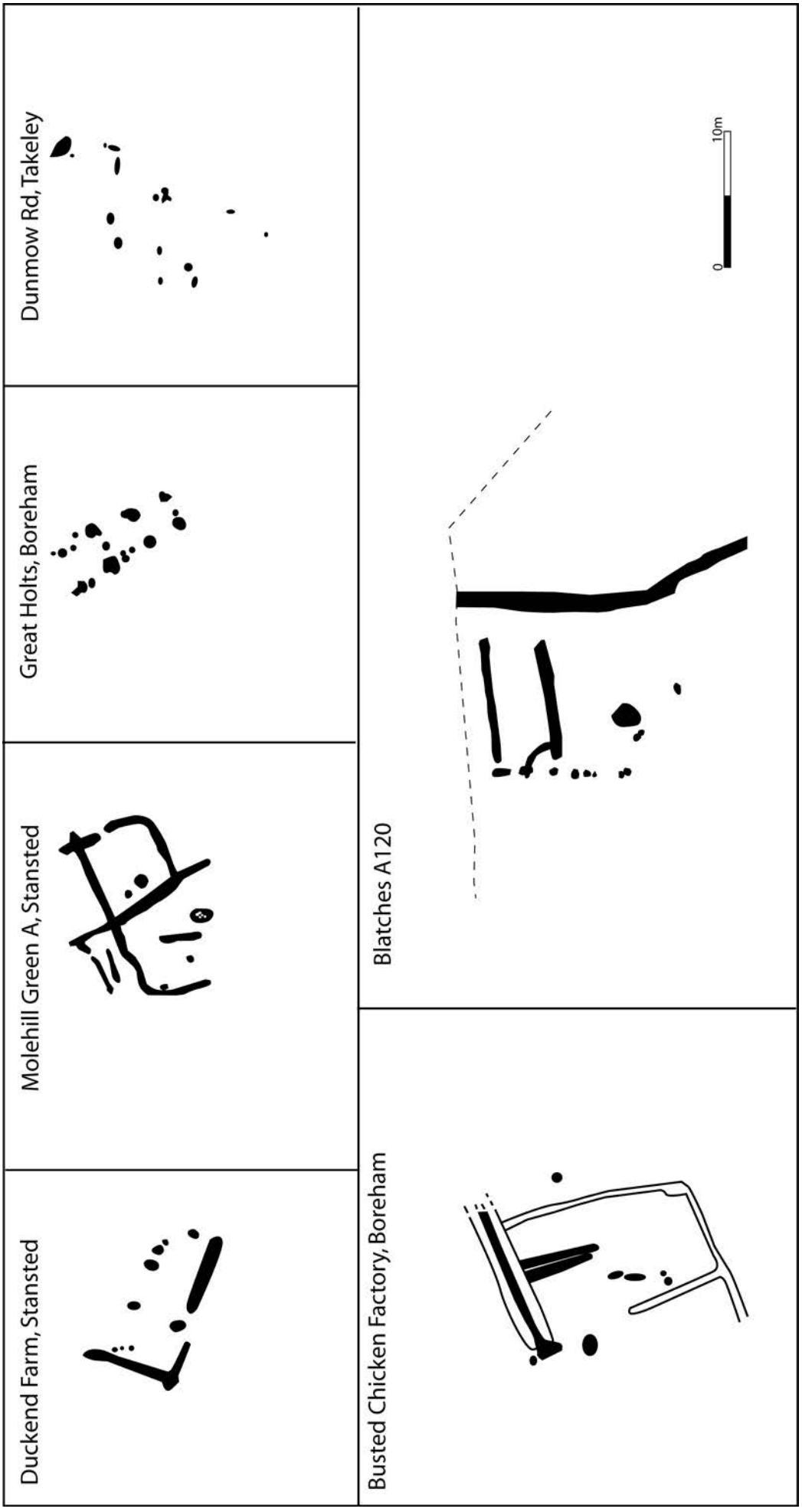

FIGURE 5: Excavated low-status sites in Essex

mid Essex zone, the Boreham Interchange site just outside Chelmsford was abandoned during the 14th century (Lavender, 1999), and the moated settlement and windmill at Boreham Airfield site (Clarke, 2003) appear to have come to an abrupt end in the mid or later 13th century. South of Chelmsford, on the London Clay, activity at the Dollymans Farm settlement site along the new A130, also ceased before the end of the 14th century (Dale *et al.*, 2005, 35). Numerous explanations have been advanced for this, including the famine and wet weather of 1315–22 (Astill and Grant 1988), the Black Death in 1349 which killed approximately one-third of the population in Essex (Poos 1991) and the subsequent recurrence of the plague in the following decades. The Peasant's Revolt of 1381 was also particularly active in Essex and may have led to more widespread dislocation and abandonment of rural sites.

However, some sites do survive beyond the 14th century and are not necessarily those of higher status which had greater resources to draw on in difficult times, and so might be expected to have persisted. In the coastal zone, excavations at Lofts Farm by the Maldon Archaeological Group of a moated homestead of c.1300 indicated that it had been extended in the 16th or 17th century before being demolished in the 18th or 19th (Wallis and Waughman, 1998, 232). In the mid Essex zone, excavations at Great Holts Farm, Boreham (Germany, 2003, 225) have demonstrated a high degree of continuity in the fieldscape and settlement activity from earlier periods through to the present day (see also Rippon this volume) and at the Shotgate Farm site on the A130, the farmstead continued in use into the 16th century (Dale *et al.,* 2005, 26–28). On the Essex Till, sites include the late medieval hunting lodge at the Long Term Car Park and the medieval landscape at Frogs Hall, Takeley (Bennett (ed), 2000, 215; Ennis, 2006). Whilst, the excavation of settlement sites indicates a degree of depopulation and shrinkage in the late 14th century, the overall pattern of the medieval landscape survives through to the present day, with the notable exception of the airport. A number of extant moated farmsteads have been traced back to their 12th to 14th century beginnings (e.g. Havis and Brooks, 2004, 368; Bennett (ed), 2005, 164; Bennett (ed), 2006, 162). Tiptofts, outside Saffron Walden, which dates from around 1330 AD has been the focus of historic building recording and limited excavation (e.g. Clarke and Germany, 1996). Like so many Essex farmsteads, it remains in occupation and is still farmed today highlighting the importance of considering standing buildings when trying to understand patterns of settlement and change.

WINDMILLS AND RURAL INDUSTRY

Seven windmill sites have been examined in Essex since 1993 as a result of developer led investigations, English Heritage funded research and local study. Two windmills have been investigated which have been found in association with other structures. At Boreham Airfield (Clarke, 2003) a 12th to 13th century moated enclosure contained a windmill, house, outbuildings, granary, and possible barn (Fig. 6), whilst excavations at the Mid Term Car Park site, Stanstead Airport (Cooke *et al.*, 2008, 208–210) revealed a late 12th/early 13th to 14th century post-built windmill that may have been associated with a small farmstead.

At the Clobbs Wood site, Little Dunmow (Timbey *et al.*, 2007), the site of a 12th–13th century post-built windmill was excavated, which may have belonged to Little Dunmow Priory. Along the route of the new A130, a 13th or 14th century windmill mound at Windmill Hill, Wickford, was excavated which had replaced an earlier watermill (Drury, 1977). No causeway was found across the circular ditch dug to create the mound and the absence of a pit for an upright post indicated that the windmill had stood on cross-trees, although all trace had been lost to ploughing (Dale *et al.*, 2005, 30). Two supposed hengiform cropmark sites at Great and Little Bentley, examined as part of the Cropmark Enclosures project (Brown and Germany, 2002) were shown to be 12th to 13th century in date and were thought to represent the sites of windmills, although only the ring ditches, which were both causewayed have been excavated so far, and the type of windmill foundation is unknown. Whilst both these structures were located close to manorial sites, neither appears to have been part of a wider complex of other buildings. As with the Windmill Hill and Boreham windmills, neither of the Little Bentley and Great Bentley sites have shown evidence for cross-trees, and it has been postulated that in Essex, early medieval windmills were not always constructed in a way that the cross trees were sunk into the subsoil (ibid, 50). In Purleigh the site of a 13th–14th century windmill or associated habitation has been identified through a combination of documentary research and field walking (Potter, 1996).

Other industrial sites

Excavations along the route of the A120 recorded a small scale pottery production centre on the west bank of the River Roding (Ennis, 2006, 41–56; Timby *et al*., 2007). Nine kilns with associated pits and gullies are likely to have formed part of the same industrial episode lasting for about 50 years from c.1175 to 1225 AD. Two different kiln types were recovered; seven equating with Musty's Type 1b and the other two with Musty's Type 1b (Musty, 1974, 44). Associated settlement appears to have been located at the end of a trackway extending from a greenside settlement at Bambers Green. Smithing hearth bottoms indicated metal-working activity in the area and there was some evidence for agricultural production taking place in conjunction with the pottery manufacturing and continuing into the 14th century (Ennis, 2006, 24). Further north, dualling of the A414 close to Junction 7 of the M11 revealed the ploughed out remains of a kiln, pot sherds dating from the 13th and 17th centuries, and some 17th-century kiln furniture for the production of fine black glazed wares (Bennett (ed), 2001, 263). At Noak Hill, near Romford, field work by the Rochford Hundred Field Archaeology Group uncovered a possible tile kiln dated to 1380–1400 AD, with recovery of around 14,000 sherds of Mill Green ware indicating the presence of an earlier pottery kiln in close proximity (Bennett (ed), 1997, 212; Bennett, 1998, 206; Bennett (ed), 1999, 220). Evidence for other industrial activity from archaeological investigations in the county since 1993 is limited, although at Lodge Farm, St Osyth, excavation ahead of gravel extraction and construction of a reservoir revealed part of what was interpreted as the yard area of a 13th-century croft, in which some form of cottage industry, possibly tanning or fulling, had taken place. This was indicated by a number of unusual features including a group of pits and a very large pit attached to an associated pond (Germany, forthcoming).

FIGURE 6: Artists reconstruction of Boreham wind-mill, © Alec Wade

Cultivation

A feature that has been found increasingly over the last fifteen years on excavated sites in Essex are parallel systems of linear, narrow and shallow channels, averaging 5 m apart and cut about 30 cm deep into the subsoil. Examples from Takeley have been attributed to the middle Iron Age to early Roman period (Roberts, 2007, 53–65) but at several other sites a medieval origin is likely. They have been found at Barling Marsh (Wade, 1994), Great Wakering (Reidy, 1994), Blatches along the A120 (Timby *et al.,* 2007), Dollymans Farm along the A130 (Dale *et al.*, 2005, 35) and at the Mid Term Car Park, Stansted (Cooke *et al.,* 2008, 186). At the Mid Term Car Park, a possible Late Anglo Saxon origin and role as bedding trenches for plants has been suggested (ibid,186), whilst the main enclosure at Dollymans Farm contained a series of shallow linear features which were thought to represent cultivation slots (Dale, *et al.,* 2005, 35). At Blatches the gullies, which were assigned an early 13th century date, terminated at a more substantial ditch running at a right angle to them, and it was suggested that they may have functioned as drainage channels alongside a raised cultivation bed (Timby *et al*, 2007, 161). A function for these slots as a form of early under-drainage seems possible, although the archaeological evidence does not fit well with that which might be expected from the earliest type of documented under-drainage, 'bush' drains; a practice known in the 17th century and widely used in Essex from the early 18th century (Cook and Williamson, 1999, 47).

The classic 'ridge and furrow' or 'broad rig' earthworks that survive in Midland districts are entirely absent from Essex, but evidence for ridging has been identified on sites across the county, with the wide range of dimensions encountered, as buried archaeological remains or more rarely earthworks, suggestive of different processes and/or periods of ridging and variation in resultant types. An extensive area of 'ridge and furrow' covering 0.69 ha was excavated at Chignall St James, to the north of Chelmsford (Clarke, 1998, 65). Here the distance between the centres of adjacent gullies ranged between 2.9 m–6.5 m in what was classified as a 11th/13th century 'narrow-rig' cultivation system of the type previously discovered in Moulsham Street, Chelmsford and discussed by Drury in his summary of 'narrow-rig' in the country (Drury, 1981, 51–58). Drury concluded that 'narrow-rig' cultivation probably remained in continuous use in Essex throughout the medieval period and beyond, although Williamson has suggested that the technique is principally one from the post medieval period (Williamson, 1999). North of Chelmsford, along the A120, two sets of parallel gullies on different orientations were recorded, one group spaced at intervals of c 8 m and the other group c 6.5m or multiples thereof (Timby, *et al.,* 2007, 175). These were considered to be characteristic of the remnants of medieval ridge-and-furrow cultivation, where all that was left surviving was the base of the furrows. To the South of the town, along the A130, the 13th or 14th century windmill mound at Windmill Hill, situated on London Clay, preserved traces of ridge and furrow (Dale *et al.,* 2005, 30) and in the historic south west of the county, also on the London Clay, ridge-and-furrow agriculture dated to c. AD 1150–1400 was found at Chingford Hospital (Truckel, 1993). Further evidence, although undated, has been recorded 2km to the north-west at Ainslie Wood and at other sites in Waltham Forest (Divers, 1996). Extensive ridge-and-furrow was also recorded at Hunts Hall Farm, Upminster (Greenwood, 1996). In the north east of the county, at Little Oakley, excavations revealed 0.6 m to 0.7 m wide furrows with slight ridges, 0.1–0.2 m high that were interpreted as evidence for ridge-and-furrow ploughing of late Saxon or early medieval date (Barford, 2002, 82).

A traditional form of ridging in the fields of Essex was 'stetch' cultivation which has long been recognised for London Clay areas of the county (Allen and Sturdy, 1980, 6) and has now been confirmed as a significant regional cultivation method (Williamson, T, 1999, 42; Martin, 2007; Martin and Satchell, 2008, 33). Despite similarities to the way classic 'ridge and furrow' was formed, the ridges and furrows created by 'stetch' cultivation differ from the broad, high curving ridges of the kind commonly associated with the open field landscape of the Midlands (Upex, 2004). The key differences are the height of the ridges and their permanence as earthworks. In 'stetch' ploughing the ridges created were low and could be removed at each ploughing (Martin, 2007, 123). As with both 'broad' and 'narrow' forms of permanent 'ridge and furrow', the main reason for ploughing in 'stetches' was to improve surface drainage of water (Evans, 1960, 30). Although modern ploughing has removed most of the visible evidence for medieval and early post medieval cultivation in Essex, recent surveys of coastal grazing marsh in the county have shown that the survival of cultivation earthworks is much greater than previously realised (Medlycott and Gascoyne, 2006), although their dating remains uncertain; the practice is known to have continued into the 20th century (Martin and Satchell, 2008, 34). As with the excavated examples there is variation in the dimensions of these earthworks. On the new RSPB reserve at West Canvey, ridges are generally between 1.5 m and 2 m wide and 0.2 m to 0.5 m high with 0.5 m to 1.0 m wide furrows, but 4 m, 9 m and 12 m wide ridges have also been recorded (Medlycott and Gascoyne, 2006). Williamson has suggested that 'stetch' cultivation was principally practised within enclosed fields rather than open-field contexts where 'broad' 'ridge and furrow' was used (Williamson, 1999, 42; 2003, 148) whilst ridge and furrow in the county has been considered by some writers to be coterminous with strip holdings (e.g. Clarke, 1998, 65), as has been demonstrated elsewhere in the region (Beresford and St Joseph, 1979). Probable strip fields have been excavated in Grays, Thurrock (Boden and Gibson, 2000), Takeley (Barber, 2006; Barker, 2003), and at the Mid Term Car Park, Stansted (Cooke *et al.*, 2008). At the Mid Term Car Park, two strip field complexes were recorded in association either with an enclosed medieval settlement or an adjacent post mill. The fields comprised parallel field ditches that lay between 10–12 m apart, and which ran down the prevailing slopes that they were situated on (ibid, 202). Excavations in Takeley revealed a series of small ditched enclosures dating from the late 12th to early 13th century and laid out at right angles to the adjacent road that may have represented the remains of cultivation strips, although the presence of pits, hearths and domestic artefacts suggested a more likely origin as a series of paddocks belonging to a roadside settlement (Barber, 2006).

CONSERVATION

Over the last 15 years it has largely been the natural environment sector, including organisations such as the National Trust, RSPB and Essex Wildlife Trust, which have taken a lead in

securing a future for the surviving elements of our medieval and earlier post medieval landscapes, many of which represent precious semi-natural habitats. In 1997 focus was brought to a number of these habitats as a result of the development of the Essex Biodiversity Action Plan, which includes: Heaths, Ancient Woodlands, Coastal Grazing Marsh and Ancient Hedgerows and Green Lanes (Essex Biodiversity Partnership, 1999) and which is currently being reviewed to encompass Wood Pasture and Veteran Trees. In two of the counties medieval forests, Epping and Hatfield, despite past mistakes (Rackham, 1996, 52–58), lessons have been learnt; management plans are in place and extensive experiments in re-pollarding, the creation of new, replacement pollards and grazing are being undertaken. In Epping Forest, scrub clearance and fencing allowed the re-introduction of grazing by English Longhorn Cattle in 1995 which has led to the successful re-establishment of heather and other heath plants (Hunter, 1999, 29–30). On Tiptree Heath, the largest remaining fragment of heath in Essex, Essex Wildlife Trust has been able to introduce grazing by Dexter's, and on their Danbury Ridge reserves, both Essex Wildlife Trust and the National Trust are gradually recreating heath and re-introducing grazing management (Hunter, 1999b, 24). In more recent years, emphasis has shifted focus from individual sites and habitats to whole landscapes as the way to conserve biodiversity in the county. Essex Wildlife Trusts Living Landscape project seeks to produce vision statements for the Living Landscape Areas it has identified in the county (EWT, 2008). These will guide the restoration of the areas for the benefit of wildlife, people and the local economy; it can be anticipated that there will be associated benefits for our surviving medieval and post medieval landscapes and their features.

Along the coast, archaeology has been used to influence and inform the management of medieval and post medieval grazing marsh in conservation ownership (see Murphy, Heppell and Brown, this volume). Most recently Essex County Council undertook survey work designed to investigate the historic environment of areas of marshland, former marshland and salt marsh, which were being considered by the RSPB for the creation of new nature reserves (Medlycott and Gascoyne, 2006). These reserves are a flagship development for the implementation of the Thames Gateway Parklands strategy (http://www.communities.gov.uk/publications/regeneration/parklandsvision). The surveys were designed to facilitate an integrated approach to the management of the historic and natural environments of these reserves from the outset and highlight the benefits of the positive relationships and partnership working that Essex County Council has developed over the last 15 years with conservation bodies. The surveys have already proved their worth to the RSPB, allowing them to plan for their reserves with a clear understanding of the high quality of the historic environment on their holding and helping to secure funding from Natural England's Environmental Stewardship scheme.

Agri-environment schemes in the county, including the old Essex coast ESA, Countryside Stewardship, and, since 2005, Environmental Stewardship, have led to conservation management on numerous medieval and earlier post medieval sites. The ESA scheme in particular resulted in the reversion of large areas of former coastal marsh from arable back to pasture, and sensitive grazing of surviving marshland with concomitant benefits to earthworks including post medieval farmsteads and medieval salterns. In 2002, a new Countryside Archaeological Advisor post was established with English Heritage support at the County Council, to take advantage of the opportunities for the historic environment offered by these and other schemes. The creation of the post led to a significant increase in the uptake of options for the historic environment available under the schemes and the subsequent protection of a number of important sites and historic landscape features. For example, at Coggeshall Abbey written advice and farm visits led to important conservation benefits under a Countryside Stewardship agreement, including: reversion of arable land to pasture over an area of the scheduled Abbey precinct; extensive grazing management of an area of former water meadows; re-instatement of a hedgerow on the line of the parish boundary, and repairs to a listed 16th century barn. For other scheduled monuments in the county, English Heritage funded management agreements have been set up on medieval sites such as Mount Bures Castle and the moated platform at Tanners Cottage in Epping; here volunteers with the districts countryside service have taken on clearance and stabilisation work under archaeological supervision and in accordance with a management plan (Gascoyne, 2006).

FUTURE AREAS OF STUDY

Over the last 15 years a significant quantity of work has been undertaken and investigations have increasingly adopted the interdisciplinary approach called for at Writtle. Steps have also been made towards the sustainable management of settlement sites and other elements of the medieval and earlier post medieval landscape that survive. What then could some of the future priorities in the county be?

- The importance of studying medieval settlement within its wider landscape is self-evident. For both excavated sites and broader settlement studies, the historic landscape must be analysed with individual components identified and mapped and changes over time recorded.
- Palaeo-environmental sampling and the dating of extant historic landscape features such as field boundaries and their components needs to be more routinely included within the development control process, in recognition of the potential information gain for all our landscapes, but particularly the coastal marshes, and to exploit their ability to allow a fuller understanding of the chronological evolution of landscapes.
- The multi-disciplinary approach exemplified by work at Stansted and elsewhere needs to be consolidated and key cartographic sources like the Chapman and Andre map need to be integrated into the Historic Environment Record.
- The issue of settlement change and, in particular, the apparent 14th century abandonment of settlements merits further examination. At present excavation has been biased towards developments on green-field sites, and hence those farmsteads that have been abandoned for one reason or another. Field walking to date cropmark sites, such as the abandoned moats recorded during the NMP project (Ingle and Saunders, 2011), should be undertaken but research also needs to examine those farms and settlements that are still in use, establishing their origins, and change

over time. Extant settlements should be investigated when the opportunities arise, recognising that this work will have the potential to advance our understanding of settlements and settlement patterns as a whole (e.g. Lewis, 2007). The growing use of historic building recording within the development control process, coupled with cartographic and documentary study, will help in developing an understanding of those medieval farms that are still in use and are not therefore subject to traditional archaeological techniques. The evolution of greens and green-side settlements, as key components of our medieval landscapes and their settlement patterns, warrants greater attention than has been received to date.

- Completion of baseline surveys for all the counties surviving coastal grazing marsh should be a clear priority and partnership working with nature conservation colleagues should continue in the expectation that an integrated approach to conservation and management will continue to bring dividends.
- The recognition of extensive cultivation earthworks in the Essex marshes highlights the need for them to be a focus for conservation action, in addition to the identified need to target grant funding on field boundaries (Martin and Satchell, 2008, 233). We need to fully understand the location, extent and development of these features, and their significance, to inform their management, particularly in areas that will come under pressure from habitat creation schemes.
- Within the context of the grazing marshes, 'wick' sites, as specialist settlements should be targeted for more detailed research. Along with sea walls, they are likely to hold information that is critical to our understanding of the sequences of reclamation along the coast and the move to arable farming.
- Efforts need to be brought to bear on the other key medieval and early post medieval historic landscape types in the county that have suffered from a relative lack of archaeological or historic analysis, but which are seeing increased attention for nature conservation purposes, including Ancient Woodlands, heaths and valley bottom pasture. The last of these is likely to come under added pressure as a result of flood alleviation measures linked to the Water Framework Directive and future climate change.
- The success of the coastal marsh surveys indicates that similar landscape scale research and survey to inform and support nature conservation efforts would be beneficial elsewhere in the county. This is likely to become increasingly important as organisations like the Essex Wildlife Trust begin to develop a landscape scale approach to nature conservation as embodied in their Living Landscape vision for the county. The mid-Essex zone, and its attractive countryside of wooded hills should be a focus for attention, and the complex of nature reserves along Danbury Ridge would be a good starting point.
- Informed by research we need to continue to seek conservation of our medieval and earlier medieval settlements and their associated landscapes through partnership working with the nature conservation sector and by agreement with farmers and other rural landowners exploiting the significant opportunities provided by grant schemes such as Environmental Stewardship.

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The archaeology of the Essex coast

Peter Murphy, Ellen Heppell and Nigel Brown

INTRODUCTION

The archaeology of the Essex coast includes terrestrial, intertidal and sub-tidal elements dating back to before the Anglian glacial stage (before about 425k BP). In this paper, however, the main focus will be on coastal wetland, intertidal and sub-tidal areas from the Mesolithic period onwards. It does not attempt to reiterate the account of recent studies presented in the *Greater Thames Estuary Archaeological Research Framework* (Williams and Brown 1999, GTESC 2010). Instead it provides an outline of current understanding and areas of research and conservation interest for the future, updating and extending an earlier overview (Murphy and Brown 1999). A wide range of archaeological remains survives in what is now the intertidal zone, including submerged land surfaces (often with associated archaeological features and artefact scatters), submerged forests, peat beds, salterns, features associated with the oyster industry and wildfowling, timber fish-traps, landings, military sites, hulks and wrecks. These historic assets lie in a dynamic intertidal environment and are subject to a wide range of threats, arising from coastal erosion, rising sea level, coastal squeeze and Flood Risk Management schemes. In places, there is also intense development pressure. Landward of existing sea defences, formerly extensive areas of grazing marsh have been transformed for industrial and agricultural purposes. Surviving areas of grazing marsh are of especial historic interest. Within these present and former wetlands, archaeological sites are buried below alluvial deposits, and there are also surviving earthworks, such as former sea-walls and the remains of salterns. Understanding of offshore submerged sites has been enhanced both by projects supported through the Aggregates Levy Sustainability Fund (ALSF) and by data obtained during development-led survey and mitigation.

A baseline archaeological survey – the Hullbridge Survey – was conducted around much of the coast in the 1980s (Wilkinson and Murphy 1995). This pioneering work, in many ways a prototype of what subsequently became known as Rapid Coastal Zone Assessment (RCZA) survey programme, was inevitably a product of its time, and gave what now seems inadequate attention to the more recent historic assets. In addition there were a number of significant gaps in its coverage of the coast. More recently, further survey has been undertaken, covering a further 60km of coast, as part of the implementation of the Greater Thames Estuary Research Framework English Heritage RCZA programme (http://www.english-heritage.org.uk/professional/advice/advice-by-topic/marine-planning/shoreline-management-plans/rczas-reports; Heppell 2004a and Heppell and Brown 2008). This phase of survey identified some 250 monuments (96% of them not previously recorded on the Essex Historic Environment Record), including timber structures, Red Hills, earthworks, and hulks. Most of these sites reflect the importance of the network of creeks and estuaries for transport and trade, well into the 20th century: they include loadings – jetties and hards – associated with individual farms on the Foulness Archipelago (Fig. 2). Remains associated with the oyster industry, particularly pits, were also recorded. Earthworks included elements of earlier sea defences, and causeways across marshland. The majority of the sites identified are likely to be post-medieval in date, although most remain undated.

Earlier Prehistory (Mesolithic-Neolithic)

The modern coastline of Essex occupies the western edge of the southern North Sea basin which, since the end of the last glacial stage, has been progressively submerged by rising Relative Sea-Level (RSL). A review of the offshore Quaternary Geology and Heritage of the Outer Thames Estuary is given in Emu/University of Southampton (2009). The 'Essex coast' was far offshore in the early Holocene. By around 13,000 BP the area was ice-free, and the overall subsequent trend has been towards rising mean temperatures, though with rapid climatic oscillations involving a short period of intensely cold climate (the Late Glacial stadial) around 11,000 years ago, when glacier ice re-advanced and periglacial vegetation extended southwards once more (Bell and Walker 1992, 68–9). Overall, however, sea-levels rose and the southern North Sea formed. Models of this process of submergence have been developed (Lambeck 1995; Shennan *et al* 2000a and b), refined by detailed assessment of available radiocarbon dates (Ward *et al*. 2006), and their archaeological significance has been appraised (Flemming 2002, 2004). Rising relative sea-level resulted in a progressive, but sub-regionally variable, submergence. Major topographic features on the low-lying North Sea plain, including the Dogger Hills, became isolated as islands. By 6000 BP and perhaps as early as 8500 BP the Dogger Bank was fully submerged. The Dover Straights were submerged around 7000 BP, and fully marine conditions had been established over most of the southern North Sea by around 6500 BP. The development of a major fresh- to brackish-water lagoonal embayment to the south of the Dogger Hills, from around 9000BP, and a penecontemporaneous linear embayment in the Southern Bight, are potentially of great significance in terms of Mesolithic population, for such low-lying areas would been ecologically diverse, providing a range of coastal brackish- and fresh-water wetland resources known to have been favoured in the Mesolithic. Alongside this process of submergence, rising mean temperatures permitted northwards spread of warmth-loving vegetation and animals, on the diminishing areas of land (c.f. Simmons *et al.* 1981; Bell and Walker 1992). Herbaceous late glacial vegetation was successively replaced by birch/pine, hazel/elm/oak/alder and lime/oak/hazel-dominated woodland, and cold-climate herbivores by red- and roe-deer and pig. As RSL rose, intertidal, peri-marine and terrestrial zones of vegetation migrated landwards and to higher elevations, and by the Neolithic period the Essex coast had taken up something approximating to its present form.

Populating this submerged landscape will be a challenge, since our techniques of offshore prehistoric site detection are rudimentary at present. In shallow waters off the coasts of Hampshire and Denmark Mesolithic middens, hearths, burials and hut sites have been reported and recorded by divers

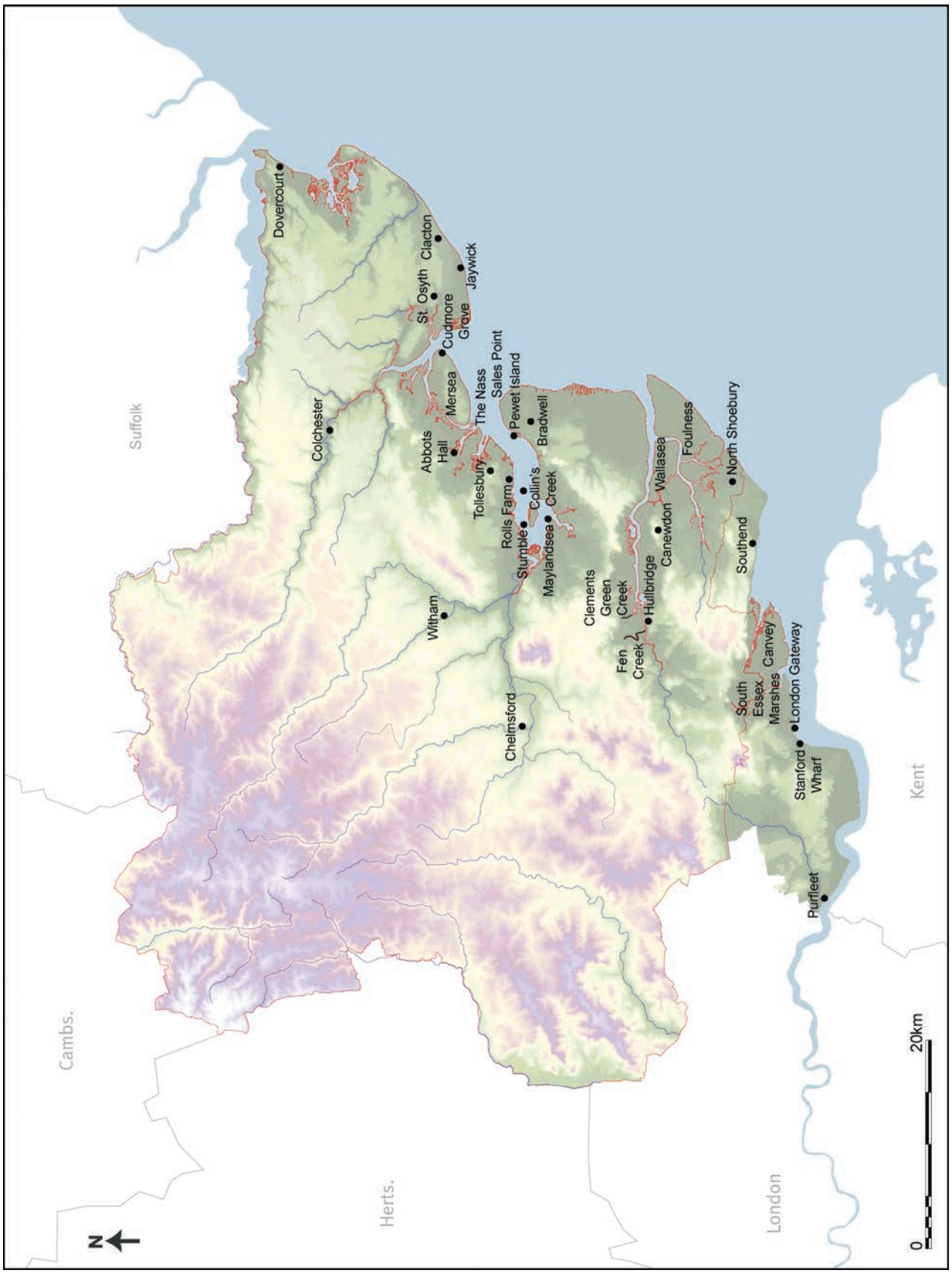

FIGURE 1: Map showing principal locations and sites mentioned in text. © Crown copyright. All rights reserved. Essex County Council 100019602, 2013

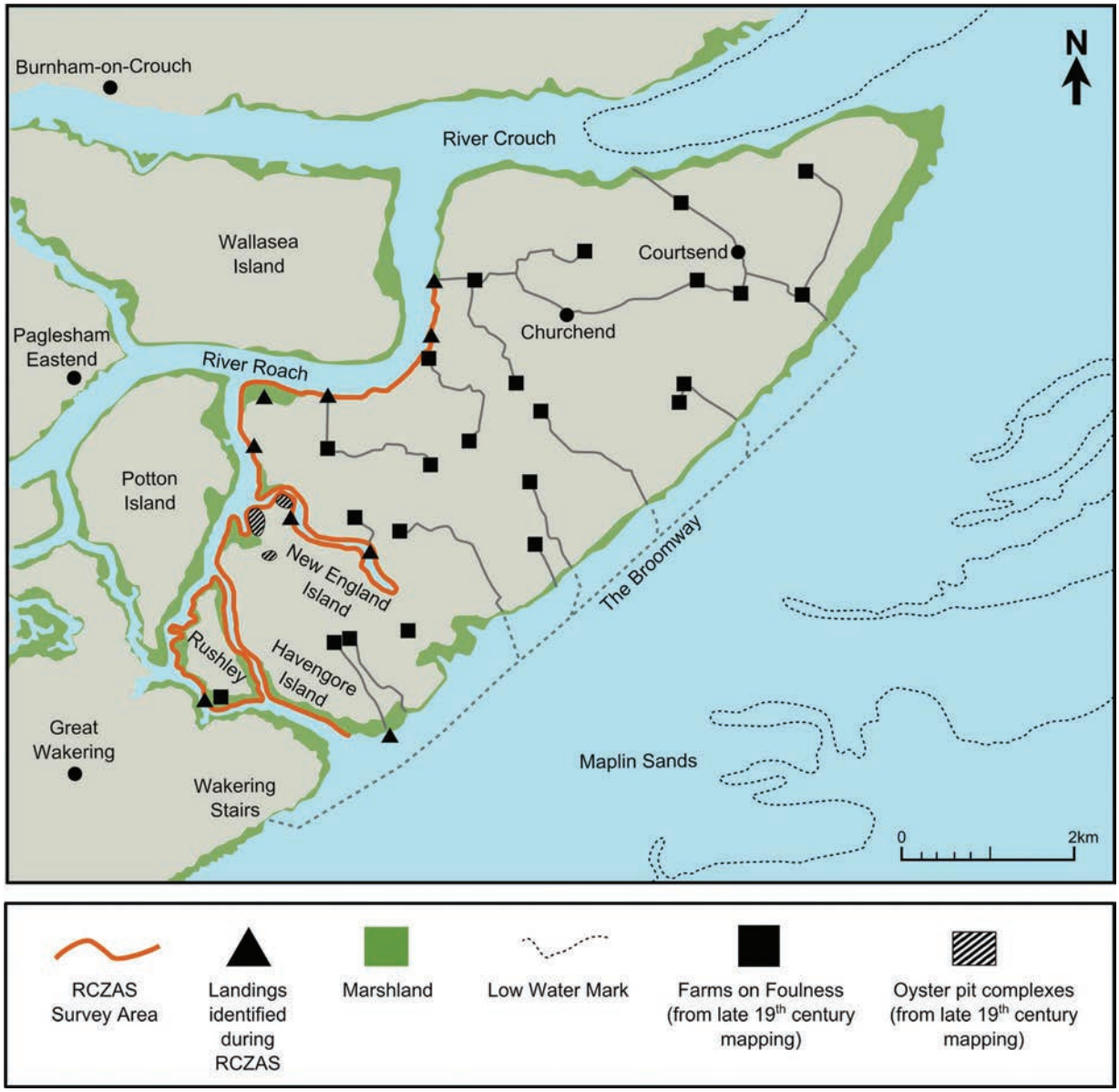

FIGURE 2: Map showing farms and their associated landings and access points on Foulness, New England, Havengore and Rushley islands.

(Momber 2004; Gron and Skaarup 2004), but site detection in the turbid waters of the North Sea will be much more difficult. Finds are frequently recovered in beam trawl nets, and the use of grab sampling to recover artefacts and pin-point sites is being explored (Wessex Archaeology 2006). Wessex Archaeology has also undertaken a number of development led desk-based assessments and evaluations, for example at the wind-farm site of Gunfleet Sands, which have required collation of various data sources, including wreck data from the UK Hydrographic Office, geophysical survey data, borehole data as well as the more familiar HER records. Overall it will be necessary to adopt a landscape approach if we are to increase our understanding of Mesolithic populations: not just because marine geophysical techniques provide data mainly at a landscape scale, but because gatherer-hunter groups at the time would have perceived and exploited their environment in terms of landscapes, not sites (Peeters, Murphy and Flemming 2009).

Intertidal prehistoric sites are not essentially *different* from offshore submerged sites – they are just more accessible and more easily studied. Within the modern intertidal zone it is possible to undertake studies in landscape archaeology almost as one might in fully terrestrial areas. Mesolithic sites in the Crouch and Blackwater estuaries in Essex, notably at Hullbridge and Maylandsea, have produced very large lithic assemblages, but the overlying deposits are much later, and so no unmodified land surface of Mesolithic date survives. However, north and east of Hullbridge there is clear evidence for a palaeochannel of the Crouch, to the north of the modern river channel. This is thought to have been an active channel during the Mesolithic, and it is likely that that waterlogged sediments contemporary with occupation are present. The research potential of this palaeochannel is considerable.

Neolithic to Beaker intertidal sites on the Essex coast have been described in Wilkinson and Murphy (1995, 71–131). Most of these sites are on the pre-transgression land surface, though in the Thames estuary the Holocene sediment sequence is much thicker than in other Essex estuaries and, at Purfleet, Neolithic material is stratified within a palaeosol

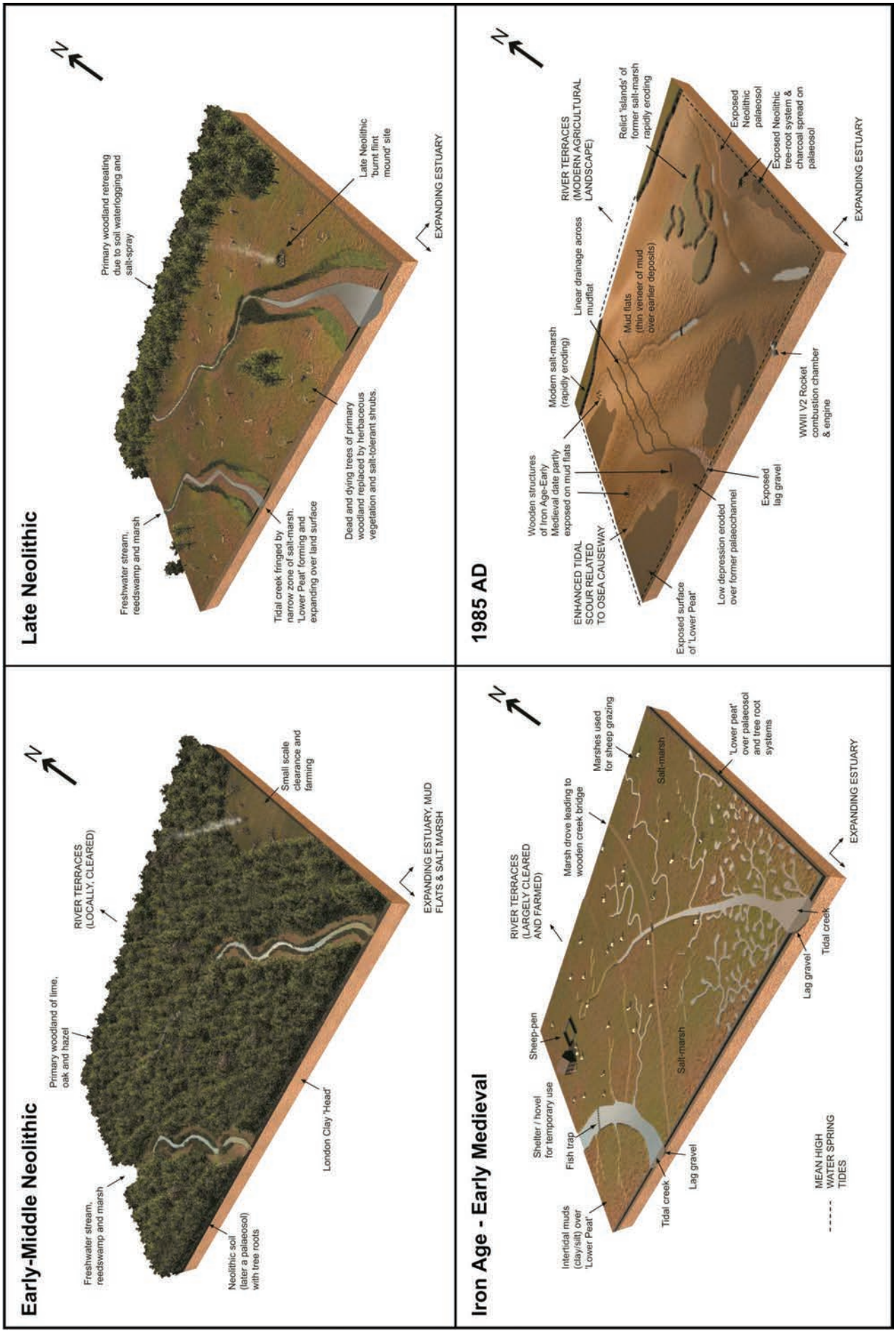

FIGURE 3: 3D computer sketch by Iain Bell showing development of the landscape at the Stumble.

formed on emergent tidal flats, which became a sub-aerially weathered terrestrial surface during the Tilbury III regression (*c.* 4930–3850 BP). Sites on the open coast at Jaywick, Clacton and Dovercourt were first fully described by Warren *et al*. (1936), on what Warren termed the 'Lyonesse Surface'.

Detailed reconstruction of coastal landscape change is possible at locations where there is sufficient information, for example at the site on a mudflat known as The Stumble, in the Blackwater Estuary, Essex (Wilkinson and Murphy 1995, 76–80; Wilkinson *et al*, 2012.). Here, there is an extensive exposure of Neolithic land surface at an elevation of –0.20 to –0.45m OD. So far as we can tell, this area was not different from other areas of lowland Neolithic valley landscape: it just happens to have been submerged later. The Neolithic palaeosol survives extensively, and the surface is littered with lithics and sherds. In 1985–6, a programme of gridded fieldwalking, test-pitting, small-scale area excavation, and analyses of soil micromorphology, palynology, plant macrofossils and faunal remains was undertaken (Wilkinson *et al* 2012). Subsequent work has involved monitoring and recording areas of land surface newly-exposed by erosion (Heppell 2004a and 2006.). The results are considered in Wilkinson *et al* (2012) and are summarised briefly here. On the basis of this work, a long-term reconstruction of changing environments and land use is possible.

The development of the Stumble landscape

(Fig. 3)

During the Early to Middle Neolithic, from 4780 ± 70 BP (OxA-229: 3685–3385 cal BC) the area was low-lying land, perhaps around 1km from the nearest tidal creek. It was drained by freshwater streams. Local soils, formed on London Clay 'head', supported primary woodland dominated by lime, oak and hazel. In Figure 3 this is depicted as almost continuous tree cover, but actually we have no reliable knowledge of the structure of Neolithic woodlands. There were certainly small-scale woodland clearances associated with farming and exploitation of wild resources. Abundant charred remains of cereals and flax, and some bone fragments of cattle and pig, were recovered, together with macrofossils of wild plant foods (hazelnuts, wild fruits, roots and tubers) and some bones of red- and roe-deer. Rising RSL resulted in expansion of the Blackwater Estuary and, by the later Neolithic, soils in the vicinity were becoming waterlogged, freshwater streams were becoming tidal creeks, and a zone of salt-marsh expanded progressively inland. Rising groundwater resulted in the death of trees at the site (and ultimately preservation of their root systems) and a thin estuarine biogenic sediment (known for brevity, but inaccurately, as the 'Lower Peat') spread over the former land surface. The area became increasingly uninhabitable. The latest evidence of human activity on the land surface is from a 'burnt flint mound' (3885 ± 70 BP (OxA- 2297): 2490–2285 cal BC).

With continued RSL rise, the area became intertidal mudflat and salt-marsh, drained by tidal creeks. Grey estuarine muds were deposited over the palaeosol and biogenic sediments. Wooden structures of Iron Age to Early Medieval date have been recorded at the site, and these are interpreted as being related to coastal activities including fishing and marsh grazing. Elsewhere in the Blackwater estuary, though not at this particular site, by the later Iron Age there was large-scale production of salt. The latest phase of human 'activity' was in the Second World War, when wreckage from an off-course V2 rocket, targeted on London, fell on the site.

In summary, at The Stumble, RSL rise has led to submergence of a wooded mid-Flandrian landscape, and landward migration of zones of mud-flat and salt-marsh. Despite these major ecological changes, there have been repeated phases of human activity at the site, each adapted to exploit a different set of resources. Comparable Neolithic landscapes and sites are known from some other locations on the Essex coast, but appear to be far less common elsewhere in the country. The Essex intertidal prehistoric sites are therefore of national significance.

LATER COASTAL ECONOMIES

There is surprisingly little evidence from prehistoric sites in Essex for the exploitation of marine foods: just occasionally some evidence has been retrieved from soil samples, for example marine mollusc shells from Bronze Age settlements at North Shoebury (Wymer and Brown 1995) and marine mollusc shells and a few fish-bones from Iron Age sites at North Shoebury (Wymer and Brown 1995), and Ivy Chimneys, Witham (Turner 1999). It is unclear why this should be; it seems incredible that the rich food resources of the coast would be entirely neglected; but it might perhaps relate to cultural dietary prohibitions. However, it should be noted that many of the prehistoric sites excavated in Essex, have been situated on acid gravels not conducive to the survival of bone and shell. By contrast, Roman sites frequently produce large amounts of shell and fish-bones. Mollusc shell assemblages from Roman sites are commonly dominated by oysters (*Ostrea edulis*), but a more specifically Mediterranean taste is indicated by the presence of carpet shells (*Venerupis* spp) at sites in Colchester and elsewhere. This is a genus of shellfish that until recently did not feature in the English diet, but now appears on the menu of Italian restaurants as 'clams'. Roman deposits at Culver Street, Colchester also produced a substantial fish-bone assemblage of 21 taxa, dominated by eel (*Anguilla anguilla*), herring (*Clupea harengus*), plaice (*Pleuronectes platessa*), and flounder (*Platichthys flesus*). However, at this site, as elsewhere, medieval refuse deposits produced much higher densities of fish-bones than Roman ones: mean values of 5.50 bones/litre of soil compared to1.82 bones/litre (Locker 1992). This pattern has generally been interpreted as indicating a general trend towards an increasing importance of fish in the diet – at least in towns – from the Mid-Late Saxon period onwards. Associated with this trend was the construction of large timber and stone fish traps, or weirs, in estuaries.

'Hedge-weirs' are typically large V-shaped lines of posts, which supported vertical hurdle panels and funnelled fish within the tidal prism enclosed within them, towards a basket, or other means of trapping, at the apex of the V. There are frequently horizontal hurdle walk-ways parallel to the walls, presumably used both for maintenance and to collect any fish which became entangled away from the apex. New archaeological survey is extending the geographical range and known density of these traps, and further recording work has been undertaken on some of the previously-known Essex traps at Collins Creek, Mersea, The Nass and Pewet Island (Heppell 2011, Rippon, 2000, Strachan, 1998). There have been few

studies of the wood and timber of which these traps were constructed, but obtaining the huge amounts needed would have been a logistical challenge. A very small sub-sample of seven hurdle panels has been examined from the trap at Collins Creek, Essex (Hall and Clarke 2000). They were made of oak, willow, birch and hazel roundwood. The distribution of stem ages and sizes did not show any clear clustering, as would be expected in managed woodland: presumably this relates to the enormous amounts of wood required, so that roundwood from many woodlands managed in different ways was stock-piled and became mixed together before final use.

There has been much discussion about when, why, and by whom, the traps were constructed. To obtain supplies of wood and timber, and to oversee the construction project, some central authority would plainly have been required. Strachan (1998) and Rippon (2000) argue for monastic direction. Monastic communities were not, of course, the *only* people who ate fish; but the fish traps could be seen as precursors of later monastic fish-ponds. Several groups of traps on the east coast have now been dated by radiocarbon (Murphy 2010): at Holme-next-the-Sea, Norfolk and in estuaries of Suffolk and Essex. Intertidal fish-traps certainly remained in use into early modern times but the radiocarbon dates reveal a distinct clustering of the probability ranges. The majority of determinations fall in a range between around 600 and 900 AD. This seems to be a general pattern: at present the evidence suggests an intense phase of activity in the 7th– 9th centuries, and reduced activity thereafter.

Why should this be? There are several possibilities. Firstly, the traps might have been *so* effective that they depleted estuarine fish-stocks to below economic levels – an early example of fish-stock depletion. Assessing the impact of these structures on stocks is difficult however, for we do not know how many traps there were originally. Some, in the Stour Estuary, are recorded as having been destroyed for navigational dredging in the 19th century and others may have been destroyed by natural processes of erosion and biodegradation without any record. Nor is the radiocarbon chronology sufficiently precise to indicate how many were in operation simultaneously. Secondly, if the traps were under monastic control and direction, then the economic and social disruption related to the 9th century Anglo-Scandinavian conflicts, and the incorporation of Eastern England in the Danelaw might have meant that levels of construction were reduced in the east of England, at least for a time. Finally, there is abundant evidence in the form of fish-bones from urban archaeological sites, as noted above, for increasing exploitation of offshore cod, herring and other fisheries in the North Sea and beyond from around the 10th century. These new sources of supply might have reduced the profitability of estuarine fish traps. It is hard to see how any of these suggestions could be tested, so they might lie in the realm of speculation.

Oysters were extensively exploited in the Roman and medieval periods, and there is some evidence for oyster cultivation (Murphy, 1995, 142–5). In the post-medieval period oyster production was a major coastal industry and archaeological evidence is widespread. Baseline surveys and aerial photography have also identified jetties, quays, and rectilinear pits associated with the oyster industry. Beyond their identification these sites have received little attention, their distribution around the Essex estuaries is included in the publication of the results of the National Mapping Programme (Ingle and Saunders 2011) and, where possible, the results have been related to the known history of the industry (Benham 1993). The NMP has also looked at the exploitation of wildfowl, particularly duck decoy ponds, and attempts have been made at phasing these with reference to documentary sources and typology (Ingle and Saunders 2011).

Salterns are conspicuous sites, due to the associated red-earth deposits and saltern mounds (Fig. 4), and have been widely recorded. The earliest known is at Fenn Creek, South Woodham Ferrers, with a radiocarbon date of 1412–1130 cal BC (3020 ± 90 BP; HAR-5733: Wilkinson and Murphy 1995, 157). Late Iron Age to Roman Red Hills are amongst the most widespread archaeological sites around the Essex coast (Murphy and Brown 1999, 16), the state of knowledge down to the end of the 1980s has been summarised by Fawn *et al* (1990). In the last 20 years aerial survey has added considerably to the already large numbers of recorded Red Hills (Strachan 1996, Ingle and Saunders 2011). Monitoring of an eroding Red Hill at has been undertaken at Rolls Farm (Heppell and Brown 2008). In advance of relatively small scale managed realignment to facilitate saltmarsh regeneration, there have been limited excavations of sites at Abbotts Hall Farm, Great Wigborough, and Tollesbury Creek. At Tollesbury pottery recovered suggested a Middle Iron Age date, and the site may have been reused as a sheep-fold in later periods (Germany 2004). Such reuse of Red Hills appears to have been a widespread phenomenon (Murphy and Brown, 1999, 18; Wymer and Brown 1995, 169). The most significant excavation in recent years has been the extensive fieldwork carried out in advance of large scale managed realignment to create mudflats, as part of the habitat compensation required by the development of the new London Gateway port. This work provided the opportunity to examine Red Hills in their wider landscape context (DP World undated; Biddulph *et al* 2011). Later salt production sites also survive as archaeological earthworks and features. A medieval example at Morris Farm, Stow Maries, has been surveyed in detail, the report noting that this is the single survivor of a group of works that once clustered around the head of Clements Green creek (Barker 2003). Together with the Scheduled site toward the mouth of the creek, in Marsh Farm. Country Park, these earthworks represent a significant survival of a group of salt production sites around Woodham Ferrers, whose importance in the medieval and early post-medieval periods is well attested from documentary sources (Emmison 1951).

The sea walls of Essex are by far the largest archaeological earthwork structures in the county, dwarfing military defensive earthworks. They are also the largest timber structures, for at many locations they include internal timber, for example at Tollesbury Creek, where a 400m length of timber posts with diagonal bracing is visible. Despite this, as Allen (1997) has noted, until quite recently the archaeological study of seawalls has been somewhat neglected; perhaps in part because, they are often still serving the function for which they were originally built. The seawalls are by no means a single build, for example the Foulness Conservation and Archaeology Society are currently carrying out a study of the phases of 'innning' on Foulness, developing earlier studies (e.g. Smith 1970) of the process. This is utilising information from aerial photography, soil types and vegetation (through local inhabitants who have

FIGURE 4: Aerial shot of a redhill on the marshes fringing the Pyefleet Channel, Mersea. The enclosure around the Red Hill and the raised embankment linking it to the higher ground, may reflect reuse of the site perhaps related to management of stock grazing the marshes. Visible in the background is the Strood causeway which links Mersea to the mainland and is of Saxon origin.

worked on the island). It is ultimately hoped that this study will point to the location of 'sea guttters', which could potentially provide dating, like a previously excavated example, where a timber structure within a relict sea wall has been radiocarbon-dated to the late fifteenth century (Crump pers comm; Crump 1981). Although documentary sources have provided some indication of phases of construction and repair, until recently, there have been no opportunities to examine the structure of extent functioning sea walls, though Managed Realignment is changing this.

Seawalls have great potential not least in integrating historical and archaeological studies, for example the relationship between secular and ecclesiastical land ownership and exploitation. The sea defences are related to natural coastal change, landownership and management, study of these structures can contribute to understanding the topographical evolution of the county. Investigation of the internal structure extant walls is limited to opportunities which arise through Managed Realignment schemes, (see below p. 152), but it could be possible, utilising existing data, for example from the grazing marsh surveys (below 148), to identify inland counter-walls that could be investigated to consider typology and, potentially, dating. It remains uncertain when the earliest defences were constructed: specifically, is there evidence for Roman reclamation?

The sea walls, however, are merely the most conspicuous, and latest, phase in the exploitation, modification, (small-scale embankment), and transformation of coastal wetlands (Rippon 2000). Transformation, as defined by Rippon, was a high-cost, high risk but potentially high-return strategy: by means of sea-wall construction, saltmarsh and even mudflat could be converted to grazing marsh and arable. The archaeological record of this process – for it is *that*, and not a single event – in the East of England is very poorly understood. Cursory inspection of almost any reclaimed coastal grazing marsh that has never been ploughed in the East of England shows that it is not flat. There certainly are some oddities, which appear to be unique, but may not be. One example is the ringwork-like earthwork and timber structure known as 'The Shipslock' at Abbot's Hall, Great Wigborough (HER 16702). It was used in the 19th century for penning sheep prior to shipment to London by barge, and also for storing the return cargo – London's manure (Martin Winter, pers.comm.). This may explain its peculiar name – presumably a corruption of either the sheep's lock or (conceivably) the shit-lock. It is, however, unclear why such a large structure was needed –

when elsewhere hurdle fences sufficed. It has been interpreted as a 'Danish Camp' in the past, and certainly requires more investigation.

More generally, some of the features visible no doubt are palaeochannels pre-dating land claim; others might be military excavations from the world wars, others are likely to be more ancient, and grazing marshes represent historic landscapes of great complexity, significance and sensitivity. Until recently very few topographic surveys have been undertaken; however, in Essex this situation is being transformed. All the major areas of grazing marsh which are in the ownership of Essex Wildlife Trust, National Trust, RSPB, and occasionally those in private ownership, have been subject to detailed survey to enhance understanding and inform long-term management of the historic environment (Brown and Pattison 1995, Barker 2000, Pattison and Barker 2000, Barker, 2003, Clarke *et al* 2007, Gascoyne *et al* 2010). Essex County Council is currently carrying out, with funding from English Heritage, a desktop survey of the Historic Environment of all the grazing marsh around the Essex coast (Gascoyne in prep). This survey work has contributed to sound working relationships with nature conservation bodies, something which has been further developed since the late 1990s by the close involvement of Essex County Council's historic environment staff in environmental enhancement carried out as part of the Thames Gateway initiative. The Thames Gateway South Essex Partnership (TGSEP) Green Grid Strategy (2005) is in many ways a model of an integrated approach to the historic and natural environments. As a consequence RSPB, in the development of major new reserves in the South Essex marshes, commissioned a detailed historic environment survey of the area (Gascoyne and Medlycott 2006). Subsequently Exeter University undertook a study looking at the wider historic development of the south Essex marshes and the potential to use that for greater public understanding (Rippon and Wainwright 2011 https://eric.exeter.ac.uk/repository/handle/10036/3030). Also arising from work in Thames Gateway has been the development of Historic Environment Characterisation (HEC) as a means of integrating historic environment issues into strategic planning. HEC has proved particularly useful with regard to coastal zone managment (e.g. Essex County Council 2009) including the selection of locations for managed realignment (below 152).

HULKS, WRECKS AND COASTAL TRANSPORTATION

The maritime heritage of the Essex coast comprises intertidal and sub-tidal hulks and wrecks, together with an infrastructure of shipyards, ports and small landings. It reflects contacts between Essex and continental Europe, London and other English ports, and individual villages, farms and industrial sites. The distribution and significance of offshore wrecks, and the potential of aggregate extraction to impact upon them, has been investigated through several projects funded via the ALSF (as distributed by English Heritage). Archive material from these projects can be accessed on the Archaeology Data Service website (http://ads.ahds.ac.uk and www.marinealsf-navigator.org.uk/). Dredging for navigational purposes can also impact submerged wrecks, the most notable recent example being a vessel discovered during dredging of the Princes Channel in the Thames Estuary by the Port of London Authority, investigated and recorded for the PLA by Wessex Archaeology. It proved to be an Elizabethan wreck, dated by dendrochronology, to soon after 1574, with a cargo of iron bars. Recovered artefacts included a cast-iron cannon with the maker's mark of Sir Thomas Gresham, a prominent Tudor merchant and royal financial advisor, who had interests in two iron-founding furnaces in the Weald of Kent. It is thought that the ship was possibly outbound from London or another harbour on the Thames or Medway with a cargo of iron bars, lead ingots and tin ingots. The vessel had a keel length of 20m to 30m and a possible overall length of up to 35m, and was probably three-masted.

Other projects have also provided information with regard to trade and links around the estuary. Desk-based research at Wallasea Island (Heppell 2004b) demonstrates the close links between the agricultural hinterland and London, using the estuary. Thames Barges are an iconic component of the area's maritime heritage, and its economic history. Operational examples are berthed at Maldon and elsewhere, and are included in the National Register of Historic Vessels. Restoration of some vessels has been funded through the Essex Heritage Trust. Hulks of coasting vessels, including barges, still survive in the Essex estuaries in a variety of conditions: a gazetteer of these sites has been collated by the Society of Sailing Barge Research (1996), which could be a useful starting point for survey and/or selection of sites for more detailed recording.

Landing points – jetties, wharves, quays and hards – are a key component of the historic environment of the Essex coast. Ferry points provided links between communities, and industrial sites around the estuary, such as brickworks, would also have had loadings. Besides major industrially-related wharves and docks, there are also many minor landings. Coastal settlements and many individual farms would have a loading from which their produce could be exported and latterly 'London Muck' imported. In the 16th century a survey of all the 'Ports Creeks and landing places in England and Wales' had a total for Essex far larger than the combined numbers for Sussex, Kent, Suffolk and Norfolk (Rippon 2000, 238). A survey of the manor of Woodham Ferrers in 1582, pointed out the advantage of having '... verye near two wharfes or crekes of the sea called Clements Grene and Woodham Fanne..... very fytt and dayley used for transportinge and conyeance of billet, hostrye, fagot, talwood, butter, cheess and corne to and from London and els where...' (Emmison 1951,7). On Wallasea the proximity of the farms to navigable waterways was mentioned in sales catalogues, and " ...the advantages arising therefrom are too obvious to be mentioned here" (ERO D/DC/41/116, dating to 1794). Extracts of title and deeds for Ferry Farm (probably Creeksea Ferry) identify goods being transported to the island which include coal and dung "... but not so as to cause a nuisance" (ERO D/DCf T170, 1868 entry). In the case of much of Wallasea Island the fragmentary remains of some landings survive, though the farms the farms they served were destroyed or demolished during or after the 1953 flood (Heppell 2004b).

Landing points have also been identified during RCZAS surveys around the estuary, including those around Foulness (Fig. 2). Two in Essex have been partly excavated; at St Osyth Creek in the Colne estuary (as part of a 'Time Team'

FIGURE 5: Excavation of the remains of a timber wharf associated with the post medieval earthwork gun emplacement at Cudmore Grove.

programme) and Cudmore Grove, Mersea Island (Fig. 5). The latter is next to an earthwork Tudor fort, with which it is thought to have been associated. Limited excavation identified a range of structural elements on the site, likely to represent a number of phases of repair or rebuild, and perhaps linked to episodes of activity at the fort (Heppell 2005 and forthcoming). The landing points around the estuary could potentially provide a wide range of information, for example on settlement patterns, local economy, and trade. They could also potentially contribute to studies on RSL. Although recorded in the more recent RCZAS they are less well represented in earlier surveys. The study of landing points is, along with waterborne transport, an area where the integration of historical and archaeological survey is likely to be effective. Interestingly, initiatives to take industrial traffic off roads and onto waterways are encouraging the regeneration and redevelopment of many waterside jetties and wharves. Derelict timber, composite wooden and iron and iron built structures will probably be destroyed as redevelopment becomes an attractive option.

Besides water-borne transportation there is evidence for tracks, fords and crossing points of various kinds. Archaeological remains include hurdles of prehistoric date recorded in various parts of the intertidal zone and, by analogy with medieval practice, interpreted as 'sheep bridges' to facilitate grazing of the open saltmarsh (e.g. Wilkinson and Murphy 1995, Heppell and Brown 2008). Timber piles below the Strood causeway linking Mersea to the mainland have been dated to the Middle Saxon period (Crummy *et al* 1982). The Broomway, which has recently found literary fame (Macfarlane 2012), from Wakering to Foulness, and other tracks and causeways linking the numerous Essex islands to the mainland, are no doubt also of considerable antiquity. Perhaps the most impressive, easily visible archaeological remains of crossing places are at Hullbridge and Fambridge, where timber and aggregate structures can be seen; they are of unknown original date, it is also uncertain whether they relate to actual bridges or are the remains approaches to ferries or fords. 'Hull Bridge' was reported as in 'great decay' in 1562 apparently because it was impossible to establish who or '...what body politic by right or custom ought to repair the same, so that it remains unrepaired to the great peril of travellers...', in 1575 the bridge was reported as 'very ruinous ' and in 1586 as 'fallen down' (Pollitt 1968, 38).

This paper has been largely concerned with archaeology, but it must be noted that the built historic environment of the coastal zone is significant and varied. Many historic buildings associated with docks and wharves have become redundant, as their functions have been superseded or relocated. The residential conversion of the huge 19th century maltings at Mistley on the Stour has provided a new use for an otherwise redundant building of considerable historic interest. A good example of adaptation for residential use is provided by Shoebury Garrison, where the barrack blocks, hospital and other buildings of the former MoD site have been successfully converted. This is a reminder of the wealth of military structures around the Essex coast, and whilst the Martello

tower at Jaywick has recently been converted as an art facility, the majority, perhaps particularly the numerous remains of defences relating to great conflicts of the 20th century, the World Wars and the Cold War, are often ill suited to beneficial reuse. In addition, Essex has a truly remarkable range of seaside heritage, and Southend pier must be one of the county's most iconic historic monuments. The sheer range and variety of the resorts of the Tendring coast, from Jaywick through Frinton, Clacton and Walton to Dovercourt would be hard to match in such close proximity elsewhere in England. Essex County Council have recently carried out a project, funded by English Heritage examining the seaside heritage of Essex (http://archaeologydataservice.ac.uk/archives/view/seaside_eh_2012/)

CURRENT WORK AND FUTURE PROSPECTS

Monitoring Survey

The dynamic nature of the intertidal zone presents practical challenges for survey and recording and erosion, which destroys existing sites and exposes new ones. Continued monitoring of areas of interest is therefore seen as a research priority (Williams and Brown 1999, 40).

In Essex a three year monitoring programme has already taken place, focusing on sites selected from those identified during the Hullbridge Survey, and which had provided data, such as site plans and sections, against which the state of sites more than a decade later could be compared (Fig. 6). Monitoring included visits to the prehistoric submerged forest at Purfleet, exposed stratigraphic sequences at Fenn Creek (a tributary of the Crouch), Red Hills and a Roman and medieval fish processing site at Leigh Beck on Canvey Island, submerged intertidal prehistoric land surfaces at Jaywick and Clacton, and a site at Canewdon, where a Bronze Age paddle was recovered in the 1980s. At Rolls Farm on the Blackwater, an area of submerged land surface, wooden hurdles of Bronze Age date, a Red Hill and the remains of an old sea wall were visited regularly over three years. The monitoring survey identified some degree of threat to all areas visited: in most cases some evidence for erosion was noted, particularly along the Thames. This could, however, be very localised, for example at Rolls Farm where broadly similar types of wooden structures were recorded on the foreshore to those seen in the earlier survey. Some features and structures eroded away entirely through the course of the survey, whereas others were still extant in 2006, having first been visited in 2001 (Heppell 2004a, Heppell and Brown 2008). The Neolithic site of The Stumble, (see above, p. 145) has also been monitored. The results indicated that artefact scatters were more widely distributed than previously noted, indicative of erosion across the flats, and the exposure of more occupation or activity areas (Heppell 2006; Heppell and Brown 2008).

Monitoring has also taken place on a number of the large fish-trap complexes in the Blackwater estuary. Despite the practical problems of accessing these sites, which are very close to low water and can only be reached by boat, visits have permitted more complete composite site plans to be built up. In one case, around 130m of an arm of a trap, unrecorded in surveys of the 1990s, was surveyed (Heppell 2011).

This work has demonstrated the importance of revisiting key areas to identify new sites that are being exposed by erosion, or by sediment movement. The technique is also effective in its own right for building up records of sites in areas where excavation can be difficult, new components of sites become visible as they erode. In the intertidal zone the local topography can change on an almost daily basis, with shifting sands and silts exposing and masking parts of sites: repeat visits allow composite site plans to be built up gradually. Clearly regular monitoring of the entire coastline is not feasible but, with the enhanced baseline data now available, it should be possible to identify key areas for monitoring.

FIGURE 6: Monitoring survey in the upper Crouch estuary, first recorded in the early 20th century and subsequently by the Hullbridge Survey, the stratigraphic sequence here is one of the cornerstones for our understanding of the development of the Essex coast.

Investigations in advance of development

Port developments involve not just construction on land, with inevitable impacts on terrestrial archaeology, but considerable sub-tidal and inter-tidal works. In terms of fully submerged archaeology, the most damaging impacts are a consequence of capital dredging to create approach channels and turning circles for the new types of vessels that will be berthed there. Methodologies for fully submerged sites can be based on BMAPA & English Heritage Guidance (2003), however, mitigation of impacts by avoidance is unlikely to be possible, since there is little or no scope for re-routing approach channels for modern vessels. So far as wrecks are concerned, techniques will include marine geophysical survey, followed by diver inspection and recording to an appropriate level. In the intertidal zone, examination of successive aerial photographs is a useful evaluation technique, which not only gives an initial impression of the types of vessels represented, but also their dates of abandonment. This can be followed by detailed ground recording.

The new London Gateway Port being developed at Shell Haven provides a good example. The site was used as a port from the 16th century, in the more recent past its focus changed to explosives and petroleum, and Thames Haven later became the first bulk petroleum site. Shell acquired parts of the site in 1911, and by 1969 it had purchased the entire site. By 1999 all production, other than bitumen and aviation fuel, had ceased and the site was identified as a location for new port development, construction of which is now well underway. Historic environment issues were fully integrated into the Environmental Impact Asessment (EIA) for the port development. A wide variety of studies were carried out, including desk-based assessment, deposit modeling and below water survey (Oxford Archaeology 2008). A sub-surface deposit model was created, enhanced to incorporate BGS data and sub-bottom profiling data, to extend the model into the estuary. Work on the 'wetside' elements of the site has included desk-based assessment and walkover of the intertidal areas, the latter identifying 32 new monuments (Wessex Archaeology 2006). Additional work included a review of wreck data held by the Port of London Authority, existing side-scan anomaly data and the acquisition of new higher resolution sidescan and magnetometer data. This refinement work has identified some 453 sites, and established the presence, extent and character of some of these. The *London, Dovenby* and *King* have been identified and the presence of anomalies at the reported locations of other vessels has been confirmed. A research focused mitigation strategy, has been developed and the fieldwork, noted above (p. 146) carried out in advance of habitat compensation at Stanford Wharf has been amongst the most significant pieces of archaeological work carried out in Essex so far this century (Biddulph *et al* 2011).

The need to secure energy supply in the 21st century will impact on the archaeology of the coastal zone. Nuclear Power stations, completed from 1956 onwards, were constructed in remote locations in case of catastrophe, including the plant at Bradwell-on-Sea. The sites of the first generation of nuclear power plants will demand expenditure on coastal defences to avoid release of radioactivity far into the future, long after their operational lives. The need to reduce carbon dioxide emissions in an attempt to mitigate global climate change is now giving increased impetus to the idea of a new programme of civil nuclear power stations. The sites of existing plants must be protected come what may, local communities have become accustomed to living close to them, and they are significant employers, so new construction on the same sites seems probable. This is likely to necessitate archaeological evaluation and excavation at Bradwell.

In terms of renewable energy supply, windfarms are becoming a component of the 'portfolio' of renewable energy sources: the government target is that 20% of the UK's energy should be supplied from renewables by 2020. The best sites for windfarms are obviously in windy places, and they should be ideally away from centres of population to minimise problems of noise and visual impact. Isolated coastal and offshore locations are often selected. However some of the most numinous historic buildings and monuments on the coasts of England owe their special character in part to their isolated visual setting, and wind-farm construction is likely to affect that, and is one of the issues with regard to the windfarm development south of Bradwell on the Dengie. Most offshore wind farms, as at Gunfleet Sands and the Thames Array will not much affect the visual setting of sites on land, since they are only distantly visible from the shore. However, construction, operation, and eventual decommissioning could have impacts on submerged wrecks and prehistoric land surfaces. The land-falls of cables, and construction of related infrastructure, could well have effects on coastal archaeological sites and so there will a need for evaluation and recording. Procedures for assessment, survey and mitigation to reduce or eliminate impacts have been developed (Wessex Archaeology 2007).

The Offshore Aggregates industry has expanded considerably in recent years, for the environmental effects of extraction on land have become less publicly acceptable. Marine aggregates are dredged from offshore with no visual impact, and they can be transported in bulk more cheaply by sea, and landed closer to the places where they are needed for construction. However, the effects of extraction on marine ecosystems and fisheries, and on submerged prehistoric sites, and more recent historic ship and aircraft wrecks have to be considered during the Environmental Impact Assessment process. The gravels and sands being extracted were deposited by rivers during the Pleistocene, and frequently include Palaeolithic flint artefacts, animal bones and fine-grained sediments which preserve palaeoecological information. During the Mesolithic, new river catchments developed, and soils formed over the Pleistocene deposits, so sites of this period, too, are easily damaged by extraction. Collaboration between industry and archaeologists to develop methods of site detection, investigation and protection (where possible) has led to a protocol setting out best practice (BMAPA & English Heritage 2003).

Future landscapes

The Essex coast has always been dynamic and this will continue through the 21st century, as a consequence of natural changes, Shoreline Management and industrial development. The policy framework for Shoreline Management is outlined by English Heritage (2003, 2–4). Coastal Risk Management is now the responsibility of the Department for Environment, Farming and Rural Affairs (Defra), and coastal schemes are undertaken by Operating Authorities (including the Environment Agency and relevant Local Authorities), using

grants provided by Defra. Over the last few decades there has been a shift away from traditional 'hard' defences – concrete and rock rubble – towards risk management approaches designed to produce naturally-functioning coastlines that will be more sustainable in the long term.

Shoreline Management Plans (SMPs) are the key element in Defra's flood and coastal Risk Management strategy. The purpose of an SMP is to provide the basis for sustainable shoreline management over the next 100 years, along a particular length of coastline. SMPs provide a large-scale assessment of the risks to people and to environmental and historic assets, and present a high-level policy framework to manage and reduce those risks. The 'first generation' of SMPs was completed during the 1990s, and they are currently being reviewed, a process recently completed for the Essex coast. Second generation plans incorporate a wider range of data than in the original plans, notably information from the county Historic Environment Record. The Defra *'Shoreline Management Plan Guidance' (Defra 2006)* defines four policy options:

- Hold the line;
- Advance the line;
- Managed realignment; and
- No active intervention.

Over the 100 year period of the plan, the preferred option will be periodically reviewed, and may change. Obviously, 'Managed Realignment' and 'No Active Intervention' policies are likely to have effects on coastal historic assets, where they result in inundation or continued erosion, but construction works associated with up-grading defences to 'Hold the Line' could also be damaging (English Heritage 2006). Consequently, Essex County Council archaeologists and English Heritage have been actively involved in the development of the Essex and south Suffolk SMP and Thames Estuary 2100, attempting to ensure that the significance of sites and historic buildings is recognised during policy development.

SMPs will typically cover a whole coastal cell or estuary system. Beneath these are Strategy Plans for specific areas covered by the SMP. Individual Schemes are subject to an appraisal process, during which their costs and benefits are considered. Defra will shortly issue new guidance on project appraisal procedures in the form of *Flood and Coastal Erosion Risk Management – Appraisal Guidance*, which will supersede the older Project Appraisal Guidance Notes (MAFF 1999 a–d and 2001, 2001a). These FCERM – AGs will also include reference to the historic environment.

Shoreline management policy is, however, driven not just by requirements for flood and coastal Risk Management, but also by ecological considerations. Over the UK as a whole, it is estimated that it will be necessary to realign 740 hectares of coast every year for the next fifteen years in order to compensate for loss of salt marsh and achieve Biodiversity Action Plan targets. The EU Habitats and Species Directive (EEC 1992), incorporated into domestic legislation, requires mitigation of damage to designated wildlife sites in terms of Habitat Creation. For example, if a managed realignment scheme results in loss of a freshwater wetland area, an equivalent area of habitat must be created: typically by excavation of lakes and lagoons, and management of drainage to encourage development of reed beds, further inland. Similarly, where a port development results in loss of salt marsh or mudflat habitat, that habitat must be re-created, usually by managed realignment and inundation of grazing marsh. Much of the coastline of Essex has wildlife designation (as AONBs, SPAs, Ramsar sites *etc*.), so the EU Directive is widely applicable. The success and significance of the archaeological investigations in advance of habitat creation at London Gateway has been noted. Even so this should not obscure the scale of the threat to the historic environment and the care that is necessary to conserve it. The historic environment is a finite non-renewable resource, and it is salutary to recall the concluding paragraph of an earlier overview of the archaeology of the Essex coast (Murphy and Brown 1999, 19). Whilst it is possible to create new mudflats or facilitate salt-marsh regeneration, those things cannot be done for red hills or Neolithic landsurfaces. Consequently, great care will need to be taken in planning the location, character and extent of realignment. The significance of the historic environment both with regard to areas of present and former grazing marsh and intertidal zone remains have been recognised by the inclusion of the whole of the Blackwater estuary, the upper Crouch estuary and Foulness on the English Heritage list of nationally significant sites as part of the *Heritage Management of Englands Wetlands initiative.*

All these considerations have led to much closer collaboration between archaeologists and nature conservation professionals, seen nowhere more clearly than in south Essex. Reference has already been made to the integrated approach to the historic and natural environment in the south Essex marshes (above p. 148). In this regard current work at Wallasea Island is a good example here, a large-scale Managed Realignment scheme – the Wallasea Wetlands Creation Project – has resulted, since 2006, in conversion of some 125 hectares of arable land to mudflat and salt-marsh, to compensate for loss of grazing marsh through development elsewhere. During the process of site selection for large scale realignment HEC was used to identify Wallasea as a location where relatively little harm could be done to the historic environment compared to more sensitive locations elsewhere on the Essex coast. Throughout the project, historic environment considerations were incorporated, and the design of the scheme has attempted to retain elements of the 'grain' of the historic landscape. Indeed the historic landscape is now being seen quite generally as key, not only to shaping landscape change but also in securing public engagement (e.g. Rippon and Wainwright 2011) both in the immediate coastal zone and more generally (Rippon 2011).

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The Essex Historic Environment Record since 1996: progress, potential and future challenges

Alison Bennett and Paul Gilman[1]

"Now, here, you see, it takes all the running you can do, to stay in the same place. If you want to get somewhere else, you must run at least twice as fast as that!" (Lewis Carroll, Through the Looking Glass, 1872)

INTRODUCTION

The Writtle Conference of 1993 and subsequent publication included a paper which summarised the development of the Essex Sites and Monuments Record and explored its potential use for archaeological research (Gilman 1996). The paper looked forward to future developments, for example with Geographic Information Systems (GIS) that provided 'the potential for the creation of a database which will embrace all aspects of the historic environment'. This statement has proved to be prophetic as recent years have seen moves towards a more holistic approach to the management of the historic environment. These have been supported by the development of Sites and Monuments Records (SMRs) into Historic Environment Records (HERs). The 2008 conference provided an excellent opportunity to review these national developments, to present the current position with the Essex Historic Environment Record (EHER), and to look ahead to future challenges and opportunities. These broad aims are reflected in the paper presented here but, as HERs have continued to experience change since 2008, the opportunity has been taken to update the paper to include some of the recent developments.

What is a HER?

There have been several attempts to define a HER, for example in 'Informing the Past 2':

> *The historic environment includes all aspects of our surroundings that have been built, formed or influenced by human activities from earliest to most recent times. An Historic Environment Record stores and provides access to systematically organised information about these surroundings in a given area. It is maintained and updated for public benefit in accordance with national and international standards and guidance. An HER makes information accessible to all in order to:*

- *advance knowledge and understanding of the historic environment;*
- *inform its care and conservation;*
- *inform public policies and decision-making on land-use planning and management;*
- *contribute to environmental improvement and economic regeneration;*
- *contribute to education and social inclusion;*
- *encourage participation in the exploration, appreciation and enjoyment of the historic environment. (Gilman and Newman 2007)*

Most recently, the Planning Policy Statement 5 Practice Guide (English Heritage 2010) stated:

> *All local authorities have access to a Historic Environment Record (HER). HERs will usually provide the core of information needed for plan-making and individual planning decisions. HERs are information services that aim to provide comprehensive access and regularly updated resources relating to the historic environment of a defined geographical area for public benefit and use. They consist of databases linked to a Geographic Information System (GIS), together with associated reference collections and are managed by dedicated staff. HERs are unique repositories of, and signposts to, information relating to landscapes, buildings, sites and artefacts spanning from the Palaeolithic period to modern times. Their content complements and enriches the collections of museums, archives and libraries, and underpins the work of historic environment services in local authorities to identify record, protect, conserve and interpret the historic environment designation and planning decisions.* (DCLG and English Heritage 2010)

The content and operation of the EHER fulfil both of the above definitions.

NATIONAL OVERVIEW

SMR to HER

As originally conceived in the 1960s and 70s, and developed in the 1980s, SMRs were archaeological records, containing information on field monuments, buried archaeology (e.g. where known or suspected from cropmarks and excavations), find scatters and find spots. However, some historic buildings were included if there was clear potential to relate them to archaeological features, such as churches and buildings on moated sites. On the whole, this was not done on a systematic basis, and more recent buildings tended to be excluded. For example, some SMRs originally had a cut-off date of 1700 AD. The 1990s saw the publication of the government's Planning Policy Guidance Note 16 on Archaeology in 1990 and PPG 15 on the Historic Environment in 1994. By providing a broadly similar approach to planning, they encouraged a more holistic approach to the management of the Historic Environment within the planning system. It also became evident that, to support such an approach, a more broadly-based evidence base would be needed. This would have to include both designated and non-designated historic buildings, conservation areas, and historic landscape features. Moreover, as perceptions of what was meant by the Historic Environment changed to include 19th and 20th century features and buildings, the time period covered would have to be extended almost to the present day. As coverage broadened and deepened, it would also become necessary to involve a wider range of potential stake holders and interested organisations and individuals.

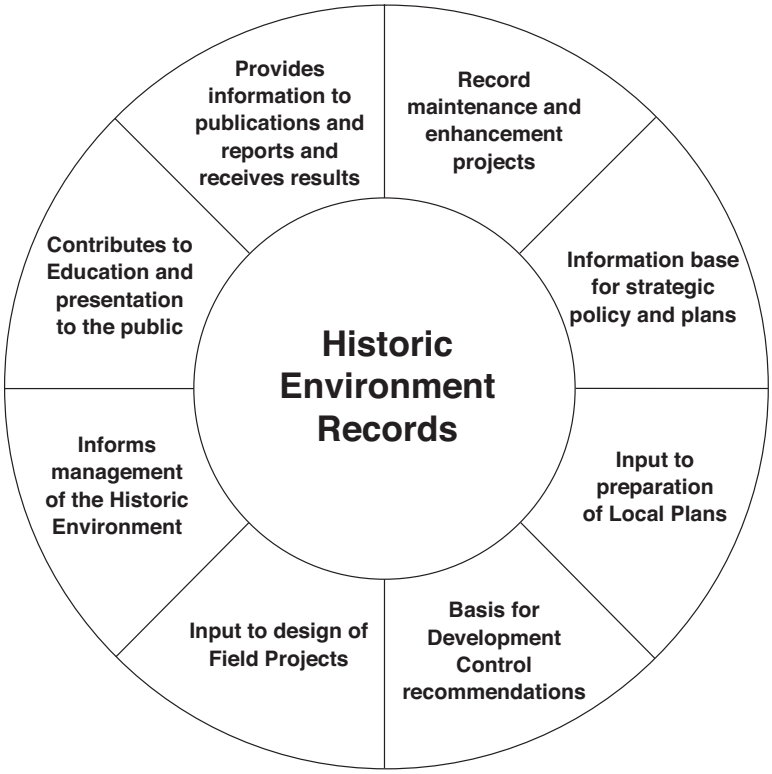

FIGURE 1: HER functions

Partnership, vision and national policy

The increased emphasis on SMRs and HERs resulted in greater co-operation between the key national organisations with an interest in their development. The former Royal Commission on the Historical Monuments of England (RCHME), English Heritage, and the Association of Local Government Archaeological Officers (ALGAO) signed a 'Co-operation Statement' containing agreed key principles governing SMR development (RCHME, English Heritage, ALGAO, 1998). The partners to this statement shared a vision of a national network of heritage records maintained to common standards and accessible to a wide variety of users. This partnership resulted in a number of important projects, including an assessment of English SMRs (Baker 1999) and a framework document for the Heritage Lottery Fund to guide bids from SMRs for funding. Responding to the assessment, a strategy document was produced by ALGAO (2000), which set out its intention to work with national partners to:

- Develop national standards for the compilation of SMRs and other heritage records.
- Encourage research into the development of a country wide network of heritage information systems.
- Build relationships between the historic environment and the wider environmental fields.
- Find resources to address SMR backlogs and to broaden the coverage of SMRs to encompass the historic environment as a whole.

In 1999 the RCHME and English Heritage were merged to create a single organisation, English Heritage, concerned with the recording, protection and management of the historic environment in England. In 2000, English Heritage co-ordinated a review for the government of all policies relating to the historic environment (English Heritage 2000). In its response (DCMS 2001), the Government committed itself to holding a consultation on the future of HERs. This took place in 2002 and resulted in a proposed two-stage benchmarking standard (Chitty 2002). The results were published together with the findings of a Heritage Protection Review (DCMS 2004). This proposed to combine the consent procedures for scheduled monuments and listed buildings, based on a unified list of listed buildings, scheduled monuments, registered parks and gardens, and registered battlefields. Consent procedures were to be devolved to local authorities who would, for the first time, have statutory duty to have or have access to a HER. These changes required legislation, and after extensive consultation a draft Heritage Bill was published by DCMS in 2008 supported by guidance on HERs. Unfortunately, in late 2008 the government decided to postpone the introduction of the legislation, pending the availability of parliamentary time. In the meantime, those elements of Heritage Protection Reform (HPR) that don't require legislation are being taken forward. In addition, a pan-government statement on the value of the historic environment was published in 2010 (DCMS 2010) alongside a new Planning Policy Statement (PPS) (DCMS 2010). The PPS, supported by accompanying practice guidance, did include a recommendation that local authorities should have or have access to HER and emphasised their value in the planning system, (English Heritage et al 2010). More recently the National Planning Policy Framework (NPPF) has incorporated and streamlined the rather large number of separate PPSs into a single document. Fortunately the NPPF retains the recommendation that local planning authorities have or have access to an HER which can be used to inform the planning process.

Data standards

There is now a widespread acceptance of the importance of data standards and there are three key platforms for this: the event-monument-source data model, the high level MIDAS standard (Lee 1998) and the national reference data terminology lists (INSCRIPTION). These have already been agreed by HERs nationally and English Heritage. Data standards help to ensure data reliability, consistency, and compatibility.

The event-monument-source data model allows data to be structured in a relational database so that units of information are not duplicated. For example, a source such as a publication can be entered only once and then linked to many events and monuments. The model separates the event, such as an excavation or survey, from the monument, that is the interpretation of what has been found, and from the source information. Use of this model also facilities the addition of new interpretations of monuments as a result of new fieldwork and research. It lies at the heart of MIDAS.

MIDAS is a content standard which defines the individual facts or 'units of information' that should be included in a standardised record of, for example, a monument or archaeological event. It is also an open data standard, in that although information schemes are described the exact structure in which data is to be recorded is not defined, so that MIDAS can be applied to a range of information systems. To promote consistency and standardisation within the HER sector, MIDAS has been used as the basis for development within the HER Level 1 Benchmarks.

Effective searching of HERs relies on the good quality indexing, ensuring retrieval of records relevant to a search; poor indexing means that records will be overlooked. INSCRIPTION, provided by the Forum on Information Standards in Heritage, is the definitive collection of wordlists and thesauri developed by various heritage bodies that are recommended for use in conjunction with MIDAS units of information. MIDAS and INSCRIPTION have been developed to work together. For each case where MIDAS recommends the use of a controlled terminology, a suitable indexing terminology has been developed by one or more of the partners in the Forum on Information Standards in Heritage, and details included in INSCRIPTION.

Management and development of data standards for the historic environment is co-ordinated through FISH, the Forum on Information Standards in Heritage. All of the major heritage bodies in the UK, including ALGAO, are involved in the steering committee of the Forum, which meets twice a year.

'Informing the Future of the Past: Guidelines for Historic Environment Records' (Gilman and Newman 2007) is a set of working guidelines appropriate to all HERs, large and small, and for all staff, volunteers and students involved in managing, running or supporting an HER. This started as a desk manual and is now available online (http://archaeologydataservice.ac.uk/ifp/). The guidelines are based on principles agreed in *Unlocking the Past for the New Millennium* (RCHME, ALGAO and EH 1998), and recording practices that are compatible with *MIDAS: A Manual and Data Standard – for Monument Inventories* (Lee 1998). They are also intended to help HERs in attaining the standards set out in *Historic Environment Records: Benchmarks for Good Practice* (Chitty 2002).

Developments in IT

We have perhaps become used to the speed of change in IT but looking back over 15 years the changes in the HER world and at Essex have been enormous. In 1993 we were looking forward to GIS but perhaps we didn't imagine how big an impact it would have. However, we are still not fully unlocking its potential, owing to lack of training/awareness but mainly to lack of strategic investment by ECC. The Internet, with the world wide web and e-mail, have of course had significant impacts on all of us, including the world of HERs. One example is the ability to make different kinds of information available digitally and faster, to communicate more quickly and with a larger audience.

HBSMR

This database was designed, with English Heritage support, specifically for SMR/HERs. Essex was one of the first HERs to move in 1998 onto this software, which is a relational database using the event-monument-source data model and MIDAS, and incorporates standardised terms from INSCRIPTION thesauri and word lists. HBSMR also links to a document and image library and to GIS. HBSMR has been developed with the active involvement of HER officers in directing its development, allowing the database to remain relevant to the changing demands on it. Approximately two-thirds of all HERs nationally use HBSMR.

GIS

The first project to make use of GIS was the Historic Towns project, funded by English Heritage from 1995 to 1999. ECC then purchased the software to link HBSMR to GIS. This enabled archaeological data to be viewed as points along with various environmental and statutory data held corporately by the county council in ArcView. Over the next few years GIS polygons were created for all the sites. GIS is now fundamental to the EHER's work, allowing all the relevant data to be viewed against a map base, and it is possible to move back to the database to see the details of the selected monuments.

The Internet

In 2001 Heritage Lottery funding was obtained to develop internet access to the EHER through the creation of the Unlocking Essex's Past (UEP) website (see below p. 164). In 2002 funding from the New Opportunities Fund to the East of England Sense of Place consortium enabled the scanning of most of the EHER's archaeological photographs which are available through the web site (http://unlockingessex.essexcc.gov.uk), linked to the relevant UEP monument records. The UEP website also includes a map interface which has just been updated, and displays both point and polygonal data.

In 2006, ECC was invited to participate in the new Heritage Gateway website developed by English Heritage as a web portal to all their own datasets and local HER data. The advantage of this web site is that Essex's data can be viewed beside the national datasets which may record slightly different information. It is now possible to access 46 HERs via the Heritage Gateway.

Professional Infrastructure

Partnership between national and local bodies has also supported the creation and development of a professional

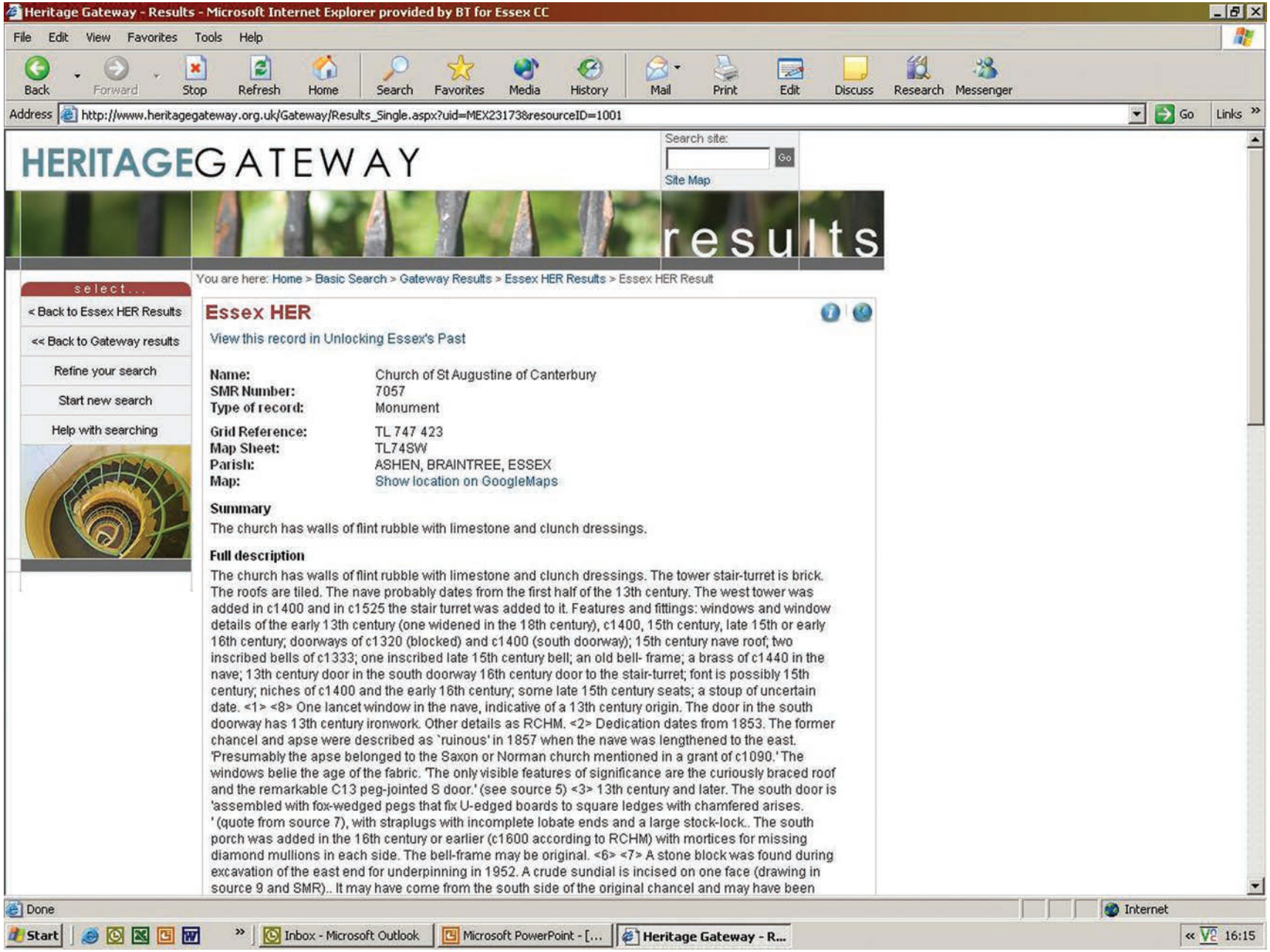

FIGURE 2: Heritage Gateway web site showing Essex HER data

infrastructure for HER officers. A HER Forum has been established that meets twice a year to provide an effective forum for informing HER professionals and discussing new initiatives. An online discussion list was also created and this has helped disseminate news and information to HER staff, as well as promoting healthy debate about topical issues. Practical support has also been provided through training courses and the production of resources for HER staff, for example the manual of good practice guidance, Informing the Future of the Past (see above, p. 157)

Record Enhancement

In practice, enhancing the coverage of HERs of the built historic environment did not prove to be easy. The national inventory of Listed Buildings did not exist in digital form, rather in paper form as a series of limited circulation documents with green covers known as 'greenbacks' which were collated by parish and for each building gave the address details, grade and list description. The former Royal Commission on the Historical Monuments of England began computerisation of the lists in 1994. However, the data did not become available for incorporation within HERs until after 1999. In the meantime, some HERs, such as Essex, began to take the initiative to create their own datasets. In Essex, this took the form of a simple MS-Access database incorporating summary details of each Listed Building in the county, drawn from the greenbacks. To save time and avoid duplication of effort, the descriptive text was not included, since it was hoped that this would eventually become available digitally from the national system. In 1999, the County Council's Archaeology and Historic Buildings Sections were merged to create an integrated Heritage Conservation service. This provided a catalyst to merge the SMR and listed buildings record to form an integrated Essex Heritage Conservation Record (EHCR), later re-named the Essex Historic Environment Record (EHER).

As well as incorporating other manual and digital data sets, the EHER has also benefitted from a wide variety of enhancement projects, and these are summarised below.

THE ESSEX HISTORIC ENVIRONMENT RECORD

Staffing

Since the Writtle conference there have been several reorganisations that affected the service, the most notable of which saw the separation of the records function from specialist advice and management of archaeological sites. From 2004 until the end of March 2012, the EHER was managed by a Historic Environment Records team of seven staff within Essex County Council's Historic Environment Branch.

The team comprised a mixture of roles, including maintenance of the EHER itself, survey and enhancement projects, and promotion of the EHER and the wider historic environment. The 20th Century defences survey was carried out by a specialist military archaeologist on a contract basis. Several volunteers also worked on the record and, from time to time, the team offered work placements to students, for example under the Project Trident scheme.

In April 2012, the County Council's specialist environmental teams (Built Environment, Historic Environment, Natural Environment and Sustainability Appraisal) were combined into a new inter-disciplinary group called Place Services. This group includes eight (formerly there were thirteen) historic environment specialists who all provide specialist advice, maintain the EHER and carry out project work. The aim within Place Services is to explore the opportunities for more integrated working across the various specialisms.. It is expected that Place Services will eventually become a Local Authority Owned Company (LATC). This will be owned by Essex County Council and will operate on a non-profit basis but with the expectation that eventually Place Services will be operating on a cost-neutral basis to the Council.

Finance

Funding for the EHER comes from a variety of sources, with a significant proportion coming from external grant-giving bodies, notably English Heritage. The 'core' funding for the maintaining and updating the EHER is provided jointly by the County Council and by 11 of the 12 Essex District Councils and Thurrock Unitary Authority, under service level agreements. However, with increasing pressure on council budgets, bringing these SLAs up to full cost recovery will be challenging. Alongside this, the team is becoming increasingly dependent on project-based funding. It will be essential that funding for HER maintenance and its public face comes through an SLA with ECC.

Database and associated systems

The Writtle Conference paper on the SMR looked forward to the introduction of more powerful relational databases, to replace the flat-file Superfile system then in use. After unsuccessful experiments with the Oracle-based 'Monarch' system offered by the RCHME, English Heritage provided pump-priming for the Exegesis company to provide a more viable system. This was developed in consultation with HER staff to ensure it met their needs, and over two-thirds of English HERs now operate this system, known as HBSMR (Historic Buildings, Sites and Monuments Record). This was initially developed using MS-Access software, but more recently a version based on SQL Server, with MS Access as the 'front end', has become available. This provides a more stable platform and is now in use with the EHER.

HBMSR is based on the national standards for HERs (see above p. 157), and incorporates nationally-agreed thesauri and word lists. The database has separate modules for recording monuments, events and information sources, as well as designations, characterisation, monument management and consultations. The database has a two-way link to GIS and can also be linked to digital image archives. Hyperlinks to Internet web pages can also be inserted into the HER records.

Geographic Information Systems (GIS)

At the time of the Writtle Conference, the then SMR was entirely based on paper maps, although GIS was shortly to be used for the Historic Towns survey project. Since then, use of GIS has become standard across the HER team and, as predicted, it has brought many benefits, for example the ability to display and analyse Historic Environment information alongside other data sets such as :

- Ordnance Survey Mapping, both current and historic
- Aerial Photography

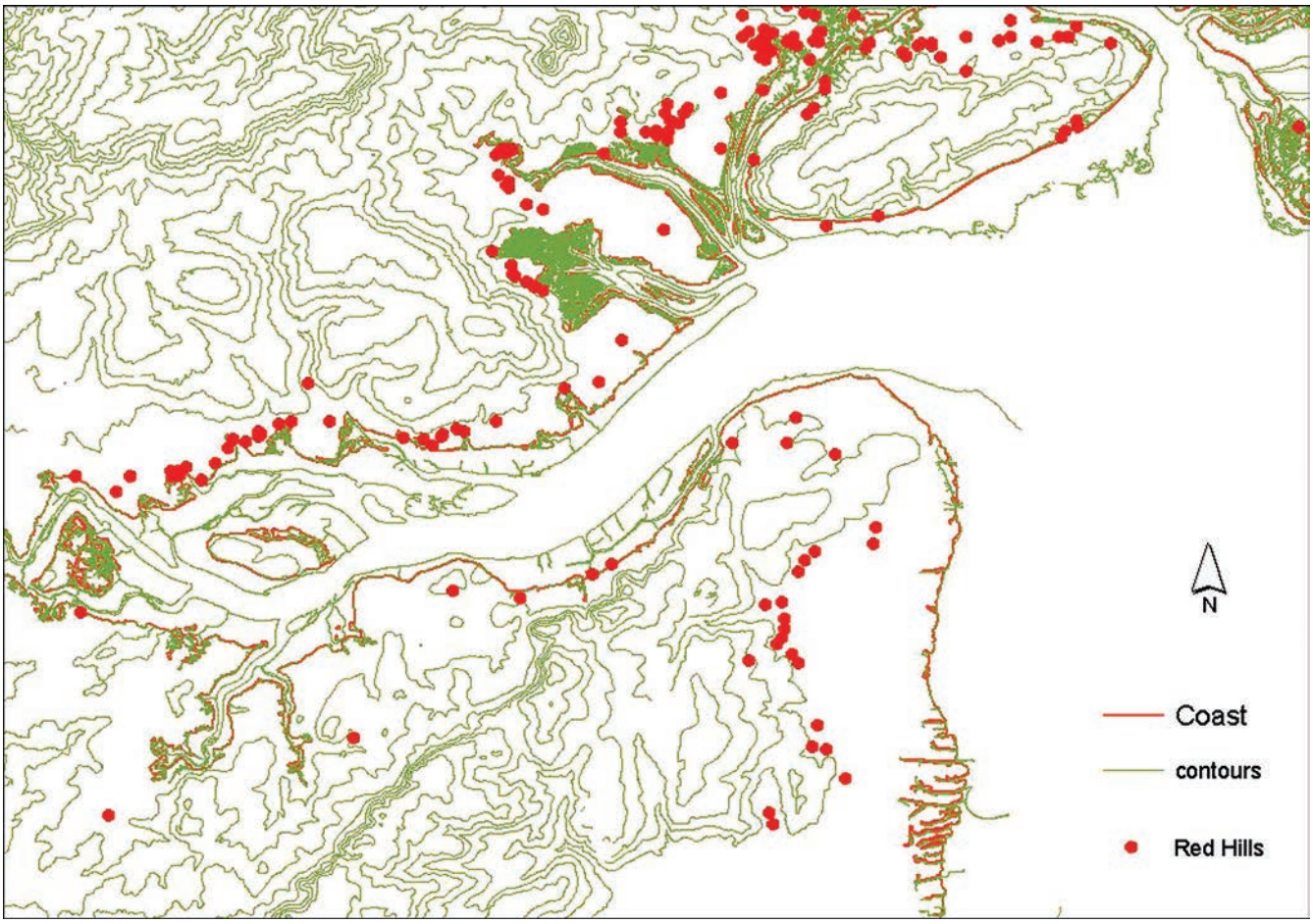

FIGURE 3: Red Hills around the Blackwater Estuary

- Elevation
  - Contours
  - Relief models
- Designations such as Scheduled Monuments, Listed Buildings, Sites of Special Scientific Interest
- Portable Antiquities Scheme (PAS)
- Geology and soils
- And many more!

A simple example is shown in Fig. 0, a distribution map of Late Iron Age and Roman salt working sites (red hills) around the Blackwater Estuary. Most of the red hills are clearly located along the 5 m contour, perhaps marking the position of the former shoreline. Furthermore, there are far more sites along the north bank of the Blackwater than the south. This prompts questions for research, whether this reflects lack of field work or whether there are other reasons behind the distribution such as different patterns of land ownership. GIS can be used in many other ways, with myriad possibilities for analysis with site location patterns, potential new sites (e.g. concentrations of PAS finds where there are no HER records), and viewsheds (Brown 2001) being just a few.

EHER ENHANCEMENT PROJECTS

Since the Writtle Conference, the EHER has benefitted from a variety of survey and assessment projects, some of which have formed part of national initiatives lead by English Heritage.

Historic Towns Survey

This formed part of English Heritage's Extensive Survey programme, and covered thirty historic towns in Essex, except Colchester which has its own Urban Archaeological Database. It was the first major EHER project to use GIS, based on a combination of ArcInfo and ArcView software. A report was compiled for each town that characterised the key monuments and urban areas, assessed the current state of knowledge and set out planning and research priorities for future work. As well as archaeological information, the reports also included historic buildings and a summary of documentary sources. A significant output from the project was supplementary planning guidance to help guide future development in the historic towns. The individual town reports are available on the Archaeological Data Service web site (http://archaeologydataservice.ac.uk/archives/archives.jsf).

Aerial Survey

The Branch's long-standing programme of regular aerial survey has continued with funding from RCHME and then English Heritage. However, with the broadening of the EHER's coverage, the scope of survey has widened to include, for example: coastal and intertidal areas; historic settlements and towns; and the built environment. Funding, largely from English Heritage, has also allowed the expansion of the programme to include more year round flying.

The value of the survey can be seen in the impact it has made on the depth and breadth of the EHER's coverage. Every

FIGURE 4: Evidence of oyster farming on the Essex coast

year, new cropmark sites are revealed, as well as new features on already known sites. For example, one flight in 1995 resulted in the discovery of 35 new red hills. Moreover, whole categories of monument have been added to the record, such as Saxon fish traps, and extensive tracts of oyster pits from this important post-medieval Essex industry.

National Mapping Programme (NMP)

The aim of the NMP is *"to enhance our understanding about past human settlement, by providing primary information and syntheses for all archaeological sites and landscapes (visible on aerial photographs) from the Neolithic period to the twentieth century,"* (Bewley 2001, 78). The Essex part of the NMP was carried out between 1993 and 2003, with funding from the RCHME and subsequently English Heritage. The project drew on all the information from existing records and utilised all easily accessible aerial photographs (vertical and oblique). The project covered 190 OS quarter sheets, mapping and recording over 10,700 archaeological sites, of which 13.2% were new to the Essex Historic Environment Record (EHER). The relatively small scale of the mapping had the advantage of speed of plotting and of placing sites into their landscape context. The project used a standard mapping scale (1:10,000) and recording system to ensure consistency in site descriptions and interpretations to facilitate analysis at not only local, but also regional and national level. The cropmark and earthwork features identified on the aerial photographs were classified morphologically, using the MORPH 2 database in an attempt to understand classes of sites in a landscape context and to explore and analyse their distributions (Ingle and Saunders 2011).

The Essex project was carried out relatively early in the NMP and was therefore done manually using overlay sheets and paper maps. Subsequent NMP projects used digital methods, so to bring them up-to-date the original Essex sheets were scanned and geo-referenced for use with GIS. This enables them to be better used to alert staff to the presence of features but they are raster images and also of relatively poor quality and limited use. They can only be viewed as one layer, with no embedded spatial information and no attributes can be added to the features, consequently interpretation of contemporary monuments is extremely problematic as the cropmarks are presented 'en masse'. Accordingly, funding was obtained from English Heritage for a pilot project to develop a methodology for converting the Essex NMP to a fully, i.e. 'vector' digital footing. This means that the individual 'layers' or cropmark types can be viewed either separately or together, and that they have attributes to enable searching and analysis, e.g. for specific enclosure shapes and sizes. There is the added benefit that the layer is of considerably better quality.

The pilot covers Tendring District which has some of the finest and most complex cropmarks in the country. As well as digitising existing NMP sites the opportunity has also been taken to examine photography post-dating 1992 (c. 6,000 photographs) that could not be fully assessed during the original NMP project. The end result is a fully digitised GIS layer, compiled to NMP standards, that can be more easily updated in the future and that can be used and analysed alongside other data sets.

Online Aerial Reconnaissance in Essex

Since the Writtle Conference, there has been increased awareness and availability of other kinds of remote sensing information, including aerial images on the Internet. There is an increasing amount of good quality imagery freely accessible over the web, particularly from Google Earth (http://earth.google.com) and Microsoft's Virtual Earth (http://Bing.com, formerly Live. Local.com). In November 2006 several new cropmark sites were noted on the accessible photographs around Stansted on Google Earth. As a result of the number of visible sites, their location and the types of site found, English Heritage agreed funding for a pilot project to assess the significance of this newly available data. The project, carried out in 2008, covered part of the M11/Harlow/Cambridge Growth Area, and developed a methodology for how best to use these new sources (Saunders 2008). Unfortunately, it was discovered that the online photography had been updated several times, which meant that some archaeological information was no longer available since the older photographs could not be accessed on-line. Subsequently, a newer version of Google Earth has been released which allows the user access the older imagery for any given area. English Heritage, therefore, agreed to fund a second phase of work to develop the original methodology, and covering a larger project area, which was carried out during 2010 and 2011.

Thematic surveys of Industrial Heritage

These surveys were touched on in the Writtle Conference paper, as they had only just begun in 1995. This was the result of an initiative by a specialist in industrial archaeology, Shane Gould, who had joined the Branch's development control team (Gould 2001). The surveys aim to enhance the EHER's coverage of industrial heritage, and are carried out in a systematic manner on an industry-by-industry basis.

They are prepared by County Council staff or by volunteers co-ordinated by HER officers. The surveys are based on extensive documentary and cartographic research, followed by field visits to assess surviving buildings and remains. A comparative report is prepared for each industry, including the grading of sites using a consistent system, and recommendations for protection and management. The reports are forwarded to English Heritage and the Local Authorities. Between 1995 and 2010, 19 surveys were completed, and more are underway. The County Council is widely seen as a national leader for this type of work.

20th-century defences survey

Again, the survey of Second World War sites had only recently begun at the time of the Writtle Conference, with a number of sample areas having been examined. These indicated that Essex, as a potential front-line county in the event of invasion in 1940, had been very heavily defended and that many sites still remained. Moreover, it was discovered that the Council had retained a wealth of original documentation about the location of defences. The initial sample areas also provoked a very positive reaction from the media and especially the public. This has continued with hundreds of letters, reports, and phone calls providing information about site location and reminiscences about relatives who built or manned the defences.

For several years, the survey was funded directly by the County Council but pressures on the Council's budget meant that this could not be continued at the same high level. As a result, the Council's reduced contribution has been used to provide match funding to a variety of external sources. These have included the Local Heritage Initiative, Borough and District Councils, Essex Environment Trust, Essex Heritage Trust, and the Hervey Benham Trust. The work has been co-ordinated under contract by a specialist military archaeologist, Fred Nash, with an increasing contribution from local societies such as A.G.E.S (Archaeology Geophysics Enthusiastic Searchers), the Clacton VCH Group, and the Colchester Archaeological Group.

Despite the fluctuating levels of grant, much progress has been made, and the survey has expanded its scope to take in the First World War and the Cold War. Since 1993, all of the four major defence lines that crossed the county in World War Two have been surveyed as has just over the half of the areas in between. A number of countywide thematic surveys have also been carried out, for example, of World War One and World War Two airfields, heavy anti-aircraft gun sites, and bombing decoy sites. To date, 78 sites have been recorded from the First World War, 3,160 sites from the Second World War, and 134 from the Cold War. These include both surviving sites and the locations where sites once existed.

The surveys have broadly followed the pattern set by the thematic industrial surveys, and each phase of work has been followed by a report that provides a grading of sites, and recommendations for management and protection. This has had some success, notably with the scheduling of an array of defences in the area around Chappel Viaduct. Other sites are being added to Local Lists, for example in Chelmsford Borough.

FIGURE 5: World War II pill box near Braintree

Historic Landscape Characterisation

Historic Landscape Characterisation (HLC) digitally records and maps the existing historic character of the rural landscape to better inform management strategies and conservation issues at local, regional and national levels. The method was pioneered in Cornwall in 1994 and developed rapidly into a major national programme. This project was carried out in Essex from 2002 to 2006 and is part of a combined East Anglian Regional project.

HLC records the historic character of each field using defined types and, where the previous type can be determined from map sources, that is recorded as well. This gives a time depth to the landscape which is useful for guiding further research.

Historic Environment Characterisation

In 2002 a series of reports was commissioned by ECC from Chris Blandford Associates to inform the Replacement Structure Plan. The reports included a sensitivity study on the Historic Environment. In the end, the Plan did not happen because of government changes to the planning system that resulted in the abolition of structure plans. However, the study was interesting as it marked the first stage in a move towards a more holistic approach that attempted to model the sensitivity of the historic environment to change at a strategic level within the constraints of available data. These did not include HLC as this had not covered the whole of Essex at that date, but a pilot study was done using this for part of the county:

> ''The approach of the adopted Structure Plan to the historic environment is to have separate sections for archaeology, scheduled ancient monuments, Conservation Areas and historic towns, and buildings of architectural and historic interest, and historic parks and gardens. However, there is scope for the historic environment to be considered in a more holistic manner, based on good practice as set out by English Heritage. For example, by giving greater emphasis to sustainability issues and making the policies more pro-active and positive. At present the policies are largely reactive (e.g. focusing on what responses should be made when a planning application is submitted).'' (Chris Blandford Associates 2002).

Following this initial work for the Structure Plan, a joint project with English Heritage, to provide Historic Environment Characterisation (HEC) of Thames Gateway, allowed the methodology to be refined. HEC has been developed into a useful means to inform strategic planning. The historic environment has been assessed using specific assessments of the urban, landscape and archaeological character, which are combined to create large Historic Environment Character Areas. These areas are broken down into more specific and more detailed Historic Environment Character Zones.

Many Districts and Boroughs have commissioned HEC to inform the creation of their Local Development Frameworks and HEC has been completed for Basildon, Braintree, Castle Point, Chelmsford, Colchester, Harlow, Maldon, Rochford, and Tendring. Thurrock and Uttlesford. Each report reveals the sensitivity, diversity and value of the historic environment resource within each District/Borough and should facilitate the development of positive approaches to the integration of historic environment objectives into spatial planning.

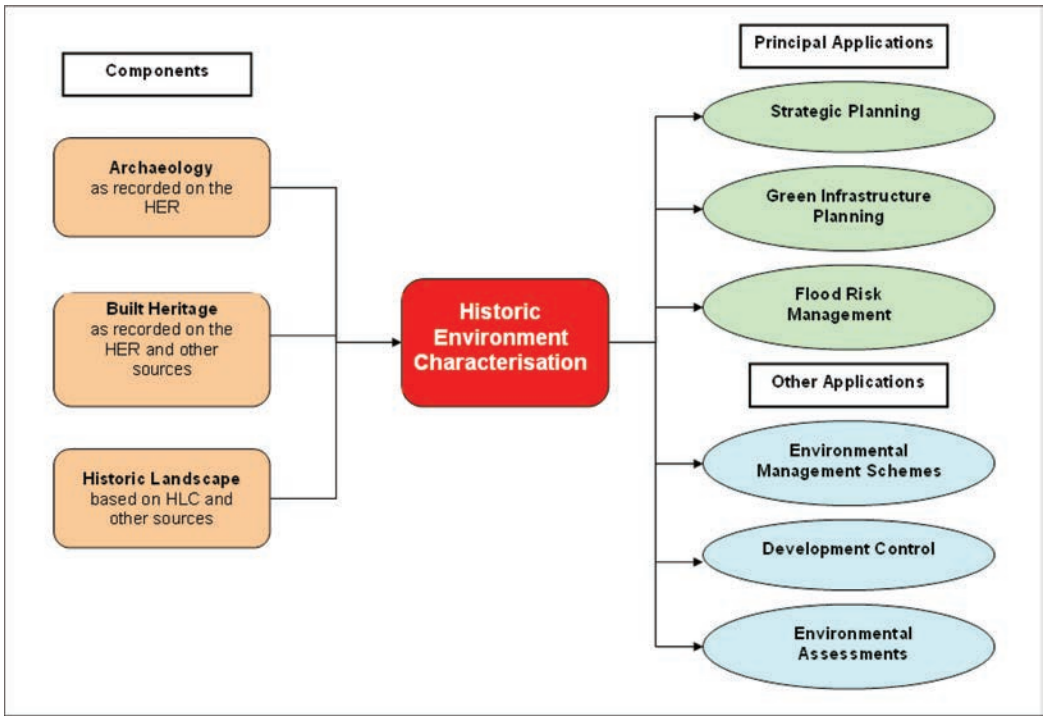

FIGURE 6: The components and applications of Historic Environment Characterisation

ENABLING EASIER ACCESS TO THE ESSEX HISTORIC ENVIRONMENT RECORD

The County Council had always encouraged public access to the SMR, and subsequently the HER. The paper records, supporting material, photographs and library were, and still are, accessible through the HER search room at County Hall, Chelmsford. However, in practice this is only available to a relatively small number of people. The rise of the Internet meant that it became possible to make the HER's digital material, especially the database, accessible to a much wider audience.

In 1999 the County Council's Historic Environment Branch obtained Heritage Lottery Funding (HLF) to make its Essex Historic Environment Record (HER) available online (see http://unlockingessex.essexcc.gov.uk). Consideration was originally given to using the Essex Record Office's SEAX system but it soon became clear that the different structure and detail of the HER database precluded this. Instead, it was decided to create a SQL Server database, with a similar look and feel to SEAX, that would contain a subset of the more specialist HBSMR system used by the EHER. Essex was one of the first organisations to apply for HLF funding to put its HER on the Internet. Unfortunately, at the time the application was made, this type of project was restricted to what were called 'revenue grants', with the maximum funding limited to £90,000. This restricted what could be achieved – for example, it was not possible to rewrite the EHER descriptions. Instead, a number of easy to read accounts of different aspects of the county's past were provided, for example 'Essex through the Ages' or 'My Town' with summaries of the histories of Essex's towns.

A major step forward in digitising actual content across the heritage services (archives, historic environment and museums), came with a successful application to the New Opportunities Fund. This enabled the scanning of thousands of aerial and other photographs, as well as the creation of a number of digital reconstructions of archaeological sites and historic buildings, accessible as 2D images or as QuickTime 3D videos.

The site is used by members of the public, students, local historical and archaeological groups, archaeological consultants and contractors, and by colleagues who do not have access to the live HER database.

A search on the website can bring up an index of the sites which fall within the area or the theme searched. From there it is possible to link through to individual site details and to view the sites against a map base. There are also pages giving period summaries, information on the development of historic towns, and general information relating to archaeology. There are also some ready-made searches for people to explore. The greatest number of searches are carried out via the site number search or the advanced search, and the web stats show that most of the other pages of information are accessed to a great or lesser extent.

The Heritage Gateway

This web site (http://www.heritagegateway.org.uk) is a joint collaboration between English Heritage, the Institute of Historic Buildings Conservation and the Association of Local Government Archaeological Officers. Users are able to cross-search over 50 different historic environment resources including over 50% of English HERs, including Essex, and nine national resources such as the National Heritage List for England, Pastscape, Images of England, the National Trust Historic Buildings Site and Monuments Record, and information on historic parks and gardens.

Essex joined this web site for several reasons. It extends the availability of the EHER data which can be viewed alongside national datasets allowing comparisons to be made; and it

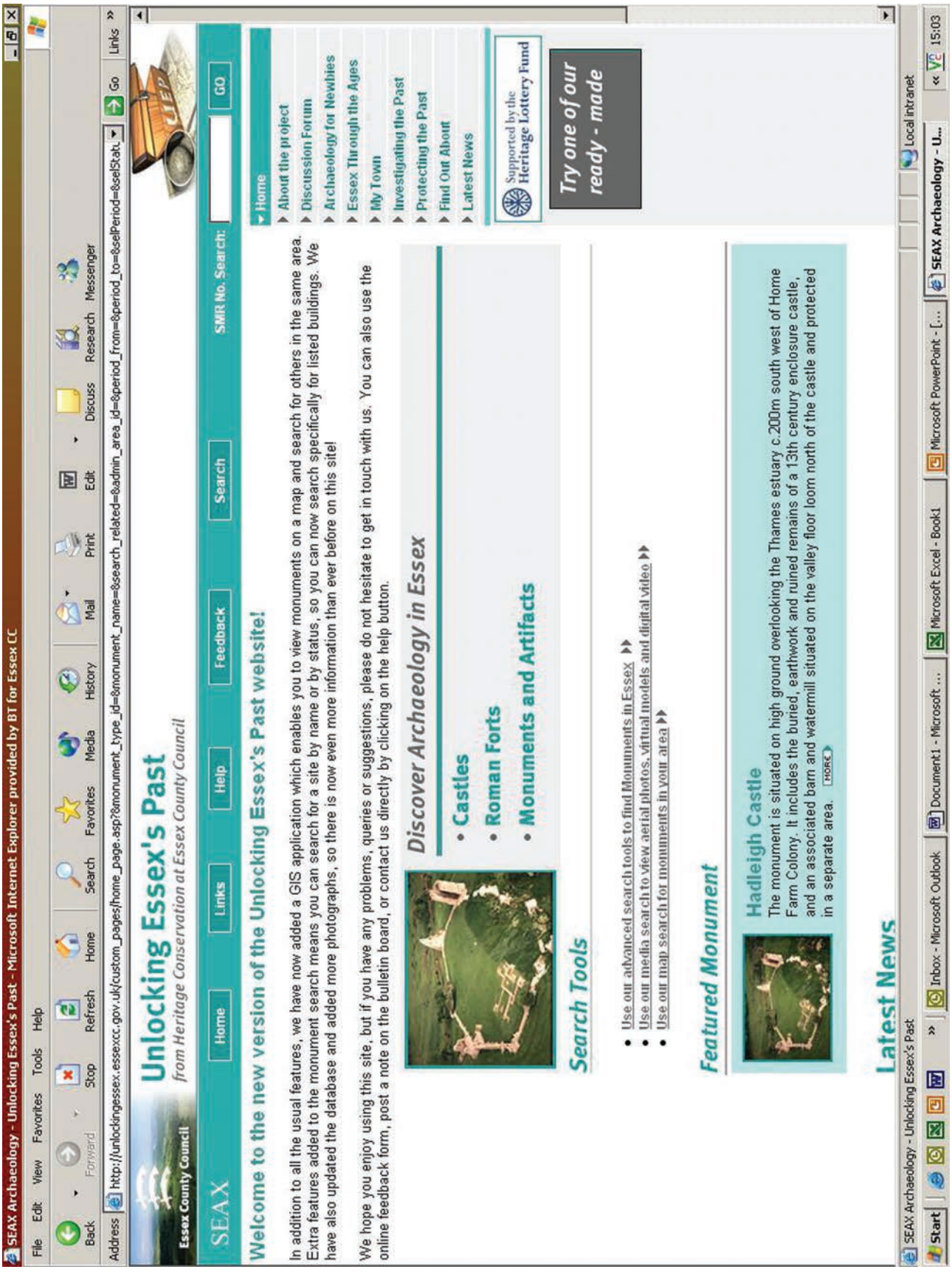

FIGURE 7: The Unlocking Essex's Past web site

allows cross-boundary or regional searches to be carried out. EHER staff were able to define how the records are displayed, and each page of the records has a link back to the UEP web site. This web site also has linked mapping.

CONCLUSION

The original version of this paper was given in 2008, the year which also saw the peak of the global financial crisis. The fall-out from that, and especially the government cuts imposed since 2010, have had significant impacts on heritage services across England, including local authority-run HERs. This was of course not known at the time of the 2008 conference when the authors looked forward with some optimism to continued developments of the EHER. These included:

- Incorporation of Characterisation information within the EHER
- Incorporation of Portable Antiquities Scheme within EHER
- Improvement of links with conservation officers
- Development of links to e-planning
- Development, and incorporate within the EHER of locally-designated heritage assets.

The financial pressures on the County Council and other public bodies have limited progress on these topics. The Local List for Chelmsford has been incorporated into the EHER and others will be incorporated, as and when resources become available. In recent years historic environment input into the planning process has become almost entirely digital. This has been largely driven by ECC's need to reduce general office storage, which led to ECC funding the scanning of a very large number of hardcopy reports in the EHER.

As explained above, the reorganising of specialist services within the County Council in 2012 means that, unlike many English HERs, Essex no longer has staff whose time is wholly committed to the maintenance and development of the HERs. In addition, after 28 years working with the ESMR and EHER, one of the authors (Paul Gilman) has been moved to other duties, working on European projects.

This paper, and its predecessor delivered at Writtle, showed that the EHER had become one of the best and most comprehensive records of its type in the country. This was the result of sustained investment by the County Council supported by substantial grant-aid from English Heritage, the Heritage Lottery Fund, the European Union, and others. Consequently, the EHER has facilitated significant contributions to research, management and promotion of Essex's Historic Environment.

There is now considerable uncertainty whether this hard-won status can be maintained. For instance, the move to funding on a commissioning basis might have adverse impacts on the public-facing work of the EHER. Discussions are in progress to see how this might be funded in the future. Currently there are no signs of a move away from austerity, and it is very much to be hoped that the gains of the last few years will not be lost.

The EHER is the basis for the management of the county's historic environment, especially via the planning system. Therefore, any reduction in the effectiveness of the EHER would have detrimental effects, which would impact on all who care for and carry out research on the county's historic environment. As noted above, the SLAs with Local Authorities, and internally with other parts of ECC, will underpin Place Services and should provide the core funding for the maintenance and development of the EHER

ENDNOTE

1 At the time of the conference Alison Bennett was HER Team Leader and Paul Gilman HER Manager. In April 2012 Alison became a Historic Environment Officer and Paul Gilman took on the role of a European Projects Manager.

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Through its Publication and Research Fund, the Society assists the publication of articles in its own and other publications. It can also make grants towards research work (for details please apply to the PRF Secretary, Dr Christopher Thornton, 75 Victoria Road, Maldon CM9 7HE). Inflation and historically low rates of interest mean that in order to continue this work, we now need to seek donations to boost the PRF. Please give as generously as you can, and complete a Gift Aid form if you are able to do so. All donations will be gratefully acknowledged. This will enable the Society to continue to support the publication of research papers and reports. Cheques should be made out to 'Essex Society for Archaeology and History' and sent to Mr W Abbott, Hon Treasurer, 13 Sovereign Crescent, Lexden Road, Colchester CO3 3UZ.

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The Archaeology of Essex: proceedings of the Chelmsford Conference

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