Research and Archaeology: a Framework for the Eastern Counties, 1. resource assessment

edited by J. Glazebrook

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Cover illustration
Recovering finds from topsoil which has been 'ploughed' by machine.
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Introduction

by D. G. Buckley

....it was equally my conviction that research should proceed, not fortuitously, but on a rigidly selective scale of values. Those values necessarily change from age to age and mind to mind; but the prime point at issue is not their individual character but the necessity for their presence. (Wheeler 1955)

I. Introduction

The words of Sir Mortimer Wheeler express the well-established belief of archaeologists, that they should carry out survey and fieldwork within a defined research context. An early attempt to achieve this on a national scale was undertaken in the 1940s by the Council for British Archaeology in a wide-ranging statement of present achievement and future needs (Hawkes and Piggott 1948). This document was largely forgotten during the frantic archaeological rescue and salvage of the 1950s and 60s which only served to emphasise the need for direction to future work. The various period societies gave much thought to the issue during the 1970s and 80s producing working documents which addressed contemporary issues and attempted to define priorities for future research, as described by Olivier (1996, 16–17). The CBA also considered the issue further, producing a theme-based research statement in 1983 (Thomas).

While failing to meet fully the need these documents did provide some direction for the expanding profession during the 1970s and 80s. However, the publication of PPG 16 (1990), and subsequently PPG 15 (1994), has established new patterns of working and emphasised the need for clear research priorities at national, regional and local level. There has also been criticism about some of the approaches being developed for the implementation of PPG 16. Articles and letters during 1994 in *British Archaeological News* (Biddle 1994a; Carver 1994) and discussion at IFA conferences and elsewhere (Biddle 1994b; Barrett 1995; Pryor 1995; Carver 1996), raised these concerns in print and fuelled a debate about the need for archaeological research. Concurrently discussion regarding the changing nature of publication and research was taking place in the Anglian region. The editorial board of *East Anglian Archaeology* raised concern about the need for a statement of research priorities following circulation of *Guidelines for the publication of archaeological research in East Anglia* (Wade1993). This was taken up by the County Archaeologists of the five Eastern Counties (Herts, Cambs, Norfolk, Suffolk and Essex) who initiated the process which has led to this report. This coincided with an initiative from English Heritage seeking regional research frameworks (see below).

II. County and Regional Priorities

The 1970s and 80s saw the appearance of county council-based archaeological staff providing a fully integrated service which for many authorities included a field team. In East Anglia, this applies to four of the five counties which have contributed to this report. In Hertfordshire an independent archaeological trust was established to carry out field work. In recent years a number of independent organisations have begun to work in the region; some are locally based, some not.

During this period, despite limitations in funding, these units endeavoured to direct their work with regard to national academic frameworks and locally identified research needs. Whilst not always formally defined in print, county level local strategies are implicit in the work of County Archaeologists. At both county and regional level, priorities for certain areas, periods or site types have been published. For example, the proceedings of a conference held in 1978 on the archaeology of Essex set out research priorities for the county (Buckley 1980), and the proceedings of a second conference held in 1993 (Bedwin 1996) have revised these priorities in the light of knowledge accumulated over the previous fifteen years. On a broader scale a report produced by the Scole Committee (1973) addressed research issues in the counties of Norfolk and Suffolk and a later book for the same counties considered aspects of prehistoric archaeology (Barringer 1984). Articles in the county journals and various other publications provide additional information, while at a regional level, the *East Anglian Archaeology* monograph series now comprises eighty volumes. All periods and many aspects of the region's archaeology have been covered in the series, including a joint research paper surveying the barrows of the region (Lawson *et al*. 1981). More recently volume 50, *Flatlands and Wetlands: Current Themes in East Anglia*, published the papers from a conference held at Norwich. This specifically aimed to draw together the results of much of the work published in *East Anglian Archaeology* and to set out some of the current themes to work in East Anglia (Gardiner 1993).

These reports cumulatively have contributed substantially to the published archaeology of the region and provide much of the foundation upon which the state of knowledge and priorities for future research can be based. However, while the combined information from these various sources has proved to be of considerable value they are of variable quality, do not have a standardised format, and the nature of the topics covered and the geographical scope varies widely.

III. English Heritage Lead

English Heritage addressed the issue of national research needs with the publication of *Exploring Our Past* (1991a). This contained a statement of the achievements of the past decade of DoE/EH funding, and presented a strategy 'born of the experiences of the 1980s, for dealing with the problems and opportunities which will be encountered during the next decade'. Included within this was a broad framework of academic priorities at national level, aimed at assisting the process of effective targeting and

maximisation of limited resources. Cross-reference to the document has become a standard practice for any project research design produced in support of a grant bid to English Heritage over the past few years. The publication of *Management of Archaeological Projects* (MAP II) also provided a standardised approach to the presentation of specific research projects (English Heritage 1991b) and gave emphasis to academic criteria underlying decision making (Andrews and Thomas 1995, 204–7). Whilst *Exploring Our Past* primarily sets out priorities at national level, it was recognised that there was also a strong argument for similarly defined policies at regional level related to, and working within, an appropriate national policy. It was this feeling which in March 1994 prompted the Chief Archaeologist at English Heritage, Dr G J Wainwright, to send a letter to a wide range of relevant organisations and other interested parties including all County Archaeologists. This raised the concern of a perceived general lack of academic focus and content to some areas of work being carried out post-PPG 16. He suggested that a structure of national and regional policies would provide appropriate frameworks within which decisions could be taken on the protection, management and recording of the archaeological resource at local level and relate national strategies to those needs. This approach produced hundreds of responses detailing many individual initiatives, comparable to those mentioned above relating to the Eastern Counties, which were already available to guide future work (Olivier 1996). Also as a response most regions of England, including the Eastern Counties, increased their efforts to respond to the challenge and set out to produce appropriate regional syntheses.

IV. Aims, Approach and Terminology

The five Eastern Counties have had an established Regional co-ordination group for some twenty years which has met to discuss mutual issues of concern. This provided a natural forum to initiate discussions to address the question of a regional framework. In 1994 the specific aim of producing a regional research document for the counties of Norfolk, Suffolk, Cambridgeshire, Essex and Hertfordshire was discussed. It was accepted that any regional research framework would have to address:

> The need to be aware of earlier studies in order to understand what is commonplace and what is out of the ordinary
>
> The need to define areas of ignorance and to suggest potentially productive lines of research.

Debate included the question of terminology and hence the scope of the papers to be produced. The agreed format was inspired by that outlined by Roger Thomas (1994) in a paper presented at the 1994 IFA Annual Conference. As preparation of this document was nearing completion the publication of *Frameworks for our Past* introduced a revised terminology (Olivier 1996, 5, fig.1) which has been adopted below.

A *research framework* comprises:

> *Resource assessment*: the current state of knowledge and understanding.
>
> *Research agenda*: gaps in knowledge, potential of resource, research topics.

Two further stages can be defined as:

> *Research strategy*: a prioritised list of objectives.
>
> *Research project*: a detailed proposal to further the research strategy.

The definition of the region, and its archaeological relevance for preparation of such a document was also considered. The group concluded that for ease of collation of data and application of the final document an East Anglian Region based on the arbitrary political boundaries was likely to be as valid as any other. The final issue for this preliminary discussion stage was that of approach, whether the papers should be thematic, based on geographical areas within the region or be presented chronologically. Again, whilst valid arguments could be made in favour of the first two approaches, the third, that of working under chronological headings, was agreed to be the most practical.

The agreed categories were:

Palaeolithic– Mesolithic
Neolithic – Bronze Age
Iron Age
Roman
Post Roman, Urban and *Rural*

Subsequently, an additional section for *Industrial Archaeology 1750–1960* was added. It was originally intended that the two post-Roman chapters would cover the Saxon, medieval and post-medieval periods. However, following consultation it was decided to expand the Industrial chapter and attempt a wider post-medieval coverage and this may have led to some overlap. A separate section on environmental archaeology was also considered, but it was concluded that it would be preferable to incorporate environmental aspects under the appropriate period headings.

After lengthy discussions it was decided that *the period reviews should be presented as relatively brief assessments of the archaeological resource of the region. Accordingly the papers which follow are very condensed and make no pretence to provide full and detailed accounts of every aspect of each period. Rather they are intended to be read as summaries which introduce the reader to the available evidence, which can be further explored through the accompanying bibliographies.*

In adopting an approach which is both chronological and highly condensed it is recognised that the result may present some practical difficulties in consultation, such as the breaking up of information derived from the study and investigation of multi-period landscapes. This would be problematic anywhere but presents particular difficulty in a region such as East Anglia (Pryor 1995). However, it is hoped that most researchers, by using the condensed text in conjunction with the extensive bibliographies, will be able to overcome these difficulties.

V. Procedure

This document, setting out the regional resource assessment, is the result of the first stage in the sequence oulined above. In its preparation it went through several phases comprising:

> A framework for each county under agreed period headings was prepared under the auspices of each County Archaeologist.

SCHEMATIC APPROACH TO ARCHAEOLOGICAL RESEARCH FRAMEWORK IN THE EASTERN COUNTIES

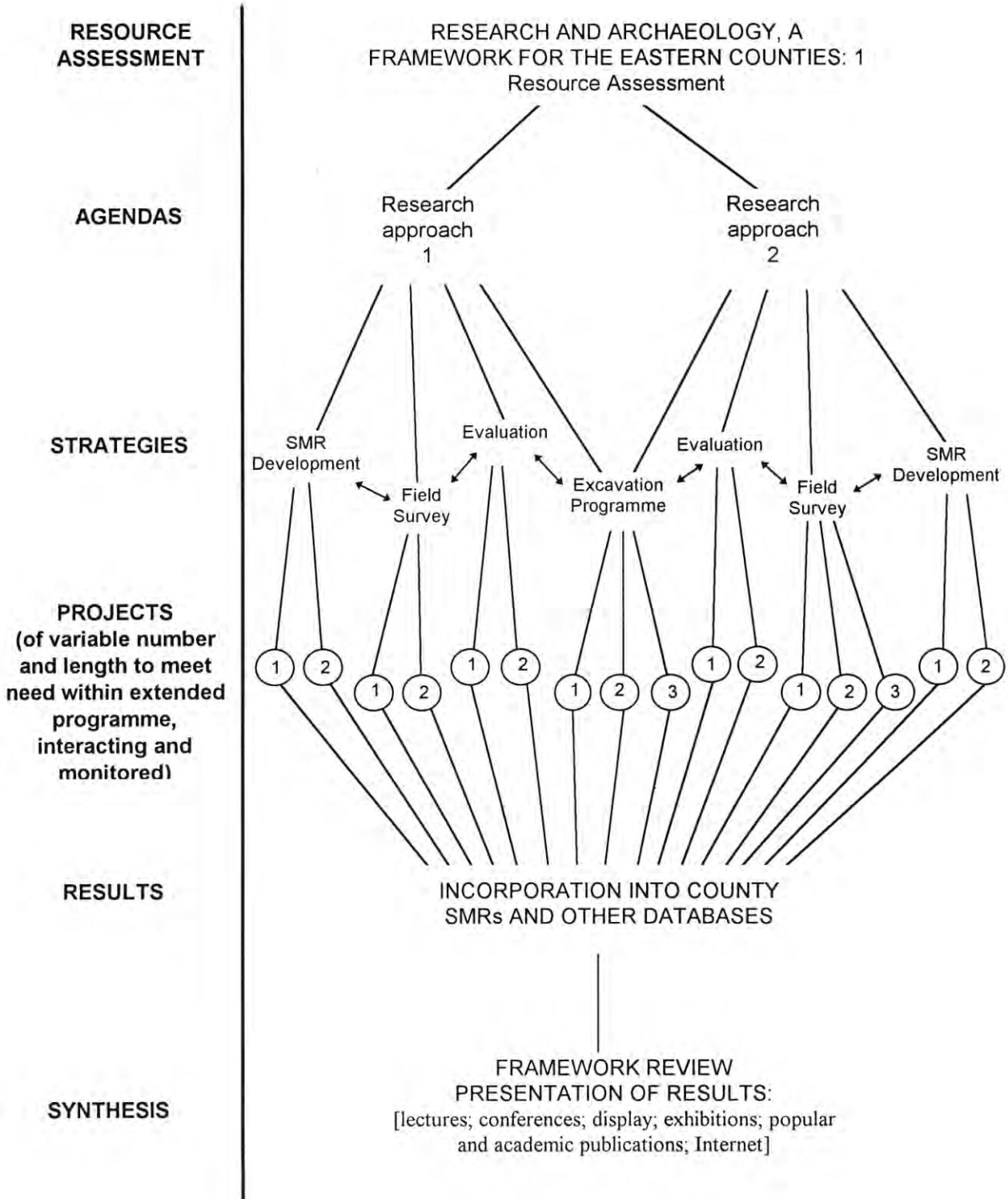

Figure 1 Schematic approach to archaeological research framework in the eastern counties

These were circulated to a wide range of informed individuals with a knowledge of the county and/or particular period and the papers revised in the light of comments received.

Nominated individuals took responsibility for preparing the regional period chapters, based on the county papers and a wide range of other sources.

The consultation exercise was repeated with these papers which were then revised in the light of comment received.

The revised contributions were brought together as a draft for this volume. The draft was reviewed collectively by the co-ordinating group and the consultation exercise repeated.

Following broad agreement on the content this volume was produced.

The task of producing the volume was never considered an easy one and it took a year longer than anticipated. However, the main reason for this was the wide ranging consultation undertaken. Given the scope of the exercise it is believed that the end product will be widely accepted and provide a firm foundation for the next stage, the establishment of a research agenda.

VI. Document Review

The present document, a resource assessment forming the first stage of a research framework for the eastern counties, is published by the Scole Committee, forming a link with their pioneering work of twenty-five years ago. Although it is the product of considerable effort and consultation it remains a statement in time. Review is considered essential and will be an ongoing part of the Regional Committee's timetable.

Acknowledgements

The main co-ordinators in this exercise have been the County Archaeologists from the five counties, namely Stewart Bryant (Herts), David Buckley (Essex), Alison Taylor (Cambs), Keith Wade (Suffolk) and Peter Wade-Martins (Norfolk). They have received much input from appropriate members of their staff, in particular Brian Ayers (Norfolk) and Nigel Brown and Caroline Ingle (Essex). Caroline Ingle has also acted as secretary to the co-ordinating Committee. The various chapters were prepared and edited by archaeological specialists in the region comprising Louise Austin, Nigel Brown, Stewart Bryant, Chris Going, Keith Wade, Brian Ayers and Shane Gould. The environmental input was provided by Peter Murphy, who is most grateful to Umberto Albarella, Charly French and Patricia Wiltshire for their comments on an earlier draft. Valuable contributions and comment were received from Adrian Olivier, Philip Walker, Deborah Priddy (English Heritage); Peter Topping (RCHME), and Jenny Glazebrook (EAA managing editor). Beyond this many people have been involved in the consultation exercise (see appendix). Thanks are given to them all for their time and input of their specialist knowledge.

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Palaeolithic and Mesolithic

by Louise Austin

I. Introduction

The Palaeolithic and Mesolithic periods are covered in this chapter although divided into two parts which are considered separately: the Lower and Middle Palaeolithic (*c*. 500,000–40,000) and the Upper Palaeolithic and Mesolithic (*c*. 40,000–6,000).

II. Lower and Middle Palaeolithic (*c.* 500,000–40,000)

Introduction

The study of early humans has made great advances in the last ten years, having become a completely inter-disciplinary study, integrating the specialist skills of anthropology and geology with those already familiar in archaeology. The purpose, to discover how people lived, does not differ from that of later periods. However, the methodologies employed may be broader ranging due to the particular problems in recovering the maximum amount of data from the types of evidence which survive.

Within the East Anglian Region there is a great history of study and research into Palaeolithic archaeology alongside work on Pleistocene geology. East Anglia is unique in having extensive deposits of Lowestoft Till, regarded as the single most important stratigraphic marker in Pleistocene Britain, although it has been suggested that there may be two stages masquerading as the Anglian (Sumbler 1995). Most of the sites which have been excavated previously can be related to this and can therefore be given a relative date, making the understanding of the period in East Anglia pivotal to the understanding of the Lower Palaeolithic in the whole of Britain. In recent years there have been a number of major studies of Quaternary sites. These have resulted in great leaps and strides being made in understanding the material culture and lifestyle of the earliest occupants of the British Isles and the changing climate and environment with which they interacted.

Currently the only work which brings together information for sites across the whole of the region is John Wymer's *Palaeolithic sites of East Anglia* (Wymer 1985). This covers Lower and Middle Palaeolithic sites and find spots in the form of a Gazetteer and also includes consideration of the depositional history of specific areas and important sites.

This work will, however, be superseded by *The English Rivers Palaeolithic Survey*, currently being undertaken by Wessex Archaeology, which will bring together a gazetteer of all sites and find spots, information and assessments of geology, the history of discoveries and minerals data as well as mapping the extent of Quaternary sediments combined with the distribution of Palaeolithic discoveries. This will undoubtedly aid planning archaeologists to identify schemes which have a potential threat to Palaeolithic archaeological remains. The finished reports for the East Anglian areas of the survey are expected in 1996 and 1997.

Evidence

The majority of the evidence for Lower and Middle Palaeolithic occupation in East Anglia survives as redeposited flakes and tools recovered from river gravel deposits. Large quantities of artefacts were identified from gravel quarries during the 19th and early 20th century due to the increased demand for gravel in the construction industry and the hand sorting of this gravel. These collections of material and the sites from which they come are not only important for identifying the presence of early humans and the potential for sites which survive undisturbed, for example at channel edges, but also for the study of specific assemblages of artefacts from particular deposits within sequences of gravel terraces. Artefacts in certain contexts of river terrace deposits give a minimum date for the use of these artefacts.

The far smaller number of sites with *in situ* archaeological material which have been discovered and/or excavated in East Anglia in recent years have been fundamental to the understanding of the British Palaeolithic as well as that of Western Europe *e.g.* Clacton, Essex; Hoxne, High Lodge and Barnham, all Suffolk. Through the recent greater understanding of the geological sequence and depositional processes which have occurred within the region, a greater understanding of the climate, the environment with which early humans have interacted and the chronological sequence of archaeological events has been possible.

It is the location of East Anglia at the limits of the ice sheets, where the Lowestoft Till from the Anglian glaciation can be directly correlated to the formation of the Thames terrace sequence, that makes this area unique for building a British Pleistocene framework. The abundance of archaeological sites that can be related to these deposits makes the area critical for the understanding of the Lower Palaeolithic in Britain.

The retreat and advance of the ice sheets over the last half million years has greatly affected the topography and geography of East Anglia. The river drainage patterns have changed dramatically over this time. One of the major elements has been the change in the River Thames drainage pattern which, prior to the Anglian glaciation, followed a north-eastern course out to sea by way of the Suffolk Coast. The subsequent changes to its course have resulted in remnants of this channel surviving in areas of Suffolk and Essex. The River Thames gravel terraces have been identified as being of great importance as the longest record of Quaternary events in Britain with a relatively uninterrupted chronological sequence of deposits. The gravels of the Lower Thames have also been found to be extremely rich in Palaeolithic sites with large collections of material from many sites including Purfleet and Grays among others along the north bank of the river. Recent work in this area (Bridgland 1994), has reassessed the sequence and has reinterpreted the dating and significance of a number of the deposits.

There is also evidence of pre-Anglian rivers from the Midlands crossing the area which is now the Fens into

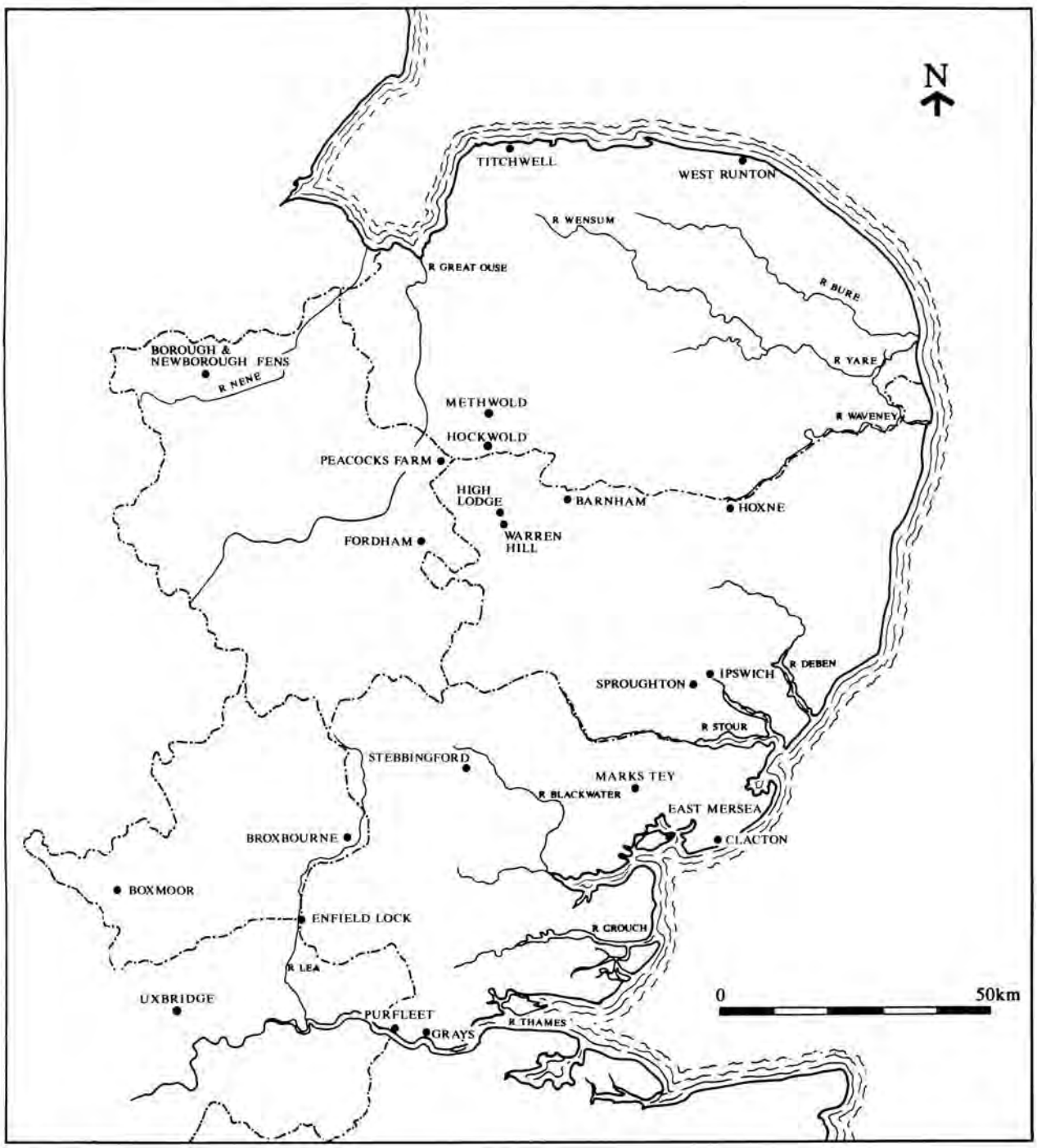

Figure 2 Location of places mentioned in text: Palaeolithic and Mesolithic

Plate I Mersea Island, Essex. Erosion of bluffs of Pleistocene sediments continues relentlessly.
Copyright: Essex County Council

Norfolk and Suffolk. Some of the gravels identified as being part of this drainage system contain Palaeolithic artefacts. However the river systems which are now in this area (*e.g.* the Ouse and the Cam) were initiated after the Anglian glaciation.

The importance of the Quaternary deposits both with and without archaeological material must be stressed. It is through the combination of these studies, fitting archaeological sites into the broader understanding of the Quaternary, its environment and depositional history as well as the chronological sequence of events that a better understanding of how people lived is being achieved.

More information is needed on all aspects of the environment. These include the understanding of formation processes of Pleistocene deposits as well as the changing interglacial faunas and floras across the region both as dating tools and environmental indicators.

The reliance on the typology of flint tools for identifying chronological markers has through recent work been shown to be problematic. Work at Barnham, Suffolk (Ashton *et al.* 1994), High Lodge, Suffolk (Ashton *et al.* 1992) and other early sites such as Boxgrove, West Sussex (Roberts 1986) suggests that 'Clactonian' flint assemblages can no longer be considered as technologically and chronologically earlier than 'Acheulian' assemblages. These assemblages may not indicate the presence of culturally separate groups. This work needs to be considered and compared with the results of further excavation of sites with both 'Clactonian' and 'Acheulian' material. Sites with flint collections previously identified as 'Clactonian' require re-analysis in order to re-assess what these industries represent.

The absolute and relative dating of archaeological sites is needed to increase the understanding of the sequence of climatic events which affect the region as well as the development of the hominid and human population within it. There is still great debate over the absolute and relative dates of many of the previously collected or excavated sites in the region. The recent work at High Lodge in Suffolk has shown that the presence of early humans in East Anglia occurs at *c*. 500,000 years BP. It is currently argued that there are no earlier securely dated sites for most of Western Europe. French claims for early sites are being seriously challenged although sites in Spain such as Atapuerca and Orce are less controversial.

The evidence for the Lower and Middle Palaeolithic periods which survives in East Anglia is of national and international importance in understanding Europe's earliest populations.

Further areas within the region which are recognised at this time (prior to the publication of results of *The English Rivers Survey*) as being of particular interest include the Chiltern Brickearths, the Breckland of Norfolk and Suffolk and particularly the pre-Anglian Bytham River deposits and post-Anglian fluvial and lacustrine deposits in this area, the palaeochannel deposits at Clacton and East Mersea, Essex, the Cam and Ouse gravel terraces and the lacustrine deposits in central Essex.

III. Environment and Economy

by Peter Murphy

The Cromerian channel deposits at West Runton, extensively studied by Quaternary palaeoecologists (West and Wilson 1966), and recently re-investigated in association with the near-complete elephant skeleton from the site, have not produced indisputable evidence for human activity. However, artefacts are now known from

late 'Cromerian Complex' sediments (*c*. 500,000 years) at Warren Hill and High Lodge, Mildenhall, relating to a pre-Anglian river system (the 'Bytham River') flowing eastwards across East Anglia from the Midlands (Ashton *et al.* 1992, 18–19). Clayey silts at High Lodge produced a pollen assemblage indicating pine/spruce woodland with juniper, herbs and heath plants, a cool temperate insect fauna and mammalian remains, including an extinct species of rhinoceros, elephant, bovid and deer.

The predominantly marine Nar Valley Beds (West and Whiteman 1985), lake deposits at Hoxne (West 1956), Clacton Channel deposits (Bridgland *et al.* 1992), and lake sediments at Marks Tey (which produced a complete interglacial pollen sequence: Turner 1970) are all attributed to the Hoxnian Stage, though it is possible that more than one interglacial stage is conflated within the Hoxnian (Bridgland 1994, 13). Palaeoecological data from Hoxne are presented by Singer *et al.* (1993). Bridgland *et al.* (1992) have re-investigated the Clacton deposits, providing additional palaeoecological information and confirming the Thames-Medway origin of the deposits; whilst the earlier studies of Singer *et al.* (1973) produced artefacts associated with bones of deer, bovids, horse, elephant and rhinoceros. Evidence for a human presence within the Ipswichian Stage, defined by the presence of *Hippopotamus* (=Oxygen Isotope Sub-stage 5e) is very slight (Wymer 1984). Molluscan and other evidence indicates that temperatures were relatively high in this interglacial, allowing thermophilous species to extend their range northwards (*e.g.* French 1982; Sparks and West 1970).

There are several palaeoecological studies of middle Devensian interstadial deposits from East Anglia (Bell 1970; Girling 1974; Bridgland *et al.* 1991). At Bramford Road, Ipswich Late Mousterian bifaces appear to have been derived from interstadial deposits (Wymer 1984, 38).

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IV. Upper Palaeolithic and Mesolithic (*c.* 40,000–6,000)

Introduction

This period covers the end of the last glaciation (Devensian Stage) and the immediate post-glacial period (Flandrian). At the beginning of this period Britain was a part of the European landmass and settlement in East Anglia was just an extension of the settlement of the North European Plain, while by the end of this period it had become more or less the island that we now know.

At the end of the Devensian the sea-level was about 30m below present with most of the land becoming forested with the ameliorating climate. In the mid 9th millennium BP, with the breaching of the land bridge, East Anglia became cut off from the rest of north-west Europe. Sea levels rose rapidly and peat formation commenced in low lying areas. A date of 8,600BP has been found for buried peat in Cambridgeshire (Hall 1987).

Material has been recovered from across the region dating to this period, however there have been very few large scale excavations, particularly in recent years.

Upper Palaeolithic

Relatively few Upper Palaeolithic sites have been identified in East Anglia. The region lacks the cave sites which have proved to be so important for the preservation of sites in other areas *e.g.* Kent's Cavern, Torbay, Devon; Creswell Crags, Derbyshire; Gough's Cave, Cheddar Gorge, Somerset; *etc*. The Earlier Upper Palaeolithic is very poorly represented across the whole region although there is somewhat more known from the Later Upper Palaeolithic.

The majority of material identified from East Anglia consists of stray artefacts with only a few known stratified sites. The main stone tool 'industry' of the British Upper Palaeolithic is identified as 'Creswellian' which has affinities with material from Northern Germany and the Low Countries which in turn are regarded as aspects of the Magdalenian, the latest of the major technocomplexes (Smith 1992). Long blade sites are also known but none have been securely dated, although a date of *c*.10,000BP is suggested by the typology and continental parallels. There is the potential for good survival of Late Glacial archaeology in alluvium in river valleys and under Fen deposits.

The recent discovery and excavation of a late glacial/early Mesolithic site of national significance at Uxbridge in the Colne valleys (Lewis forthcoming) has particularly highlighted the potential for the survival of well preserved occupation sites. Although this site technically lies outside East Anglia similar situations occur in the alluvium and peat of valleys and fens across the region. This discovery emphasises the need to consider the potential for the preservation and survival of such sites in alluviated and other areas where buried landscapes may survive.

Recent work at Titchwell, Norfolk (Wymer pers. com.) has discovered evidence of a long blade industry similar to that identified at Uxbridge. This adds to mounting, but currently unpublished, evidence of similar long blade sites below the water table of Norfolk and Suffolk Rivers and the Fens. Other examples of long blade industries in East Anglia come from Hockwold-cum-Wilton and Methwold, Norfolk (Healy 1996, 53).

There are no recent published accounts which deal specifically with the Upper Palaeolithic of East Anglia. For accounts of recently excavated sites from the period the following should be considered: Hengistbury Head, Dorset (Barton 1992) and Uxbridge, Middlesex (Lewis forthcoming).

In general this period is still poorly understood in East Anglia. The rarity of well preserved sites increases the importance of those few which may survive. It is of vital importance that the potential presence of such sites is considered in all appraisal, assessment and evaluation which is undertaken within the region.

Mesolithic

East Anglia is quite rich in Mesolithic sites, and has a far more widespread distribution of known remains than for the Upper Palaeolithic. However, although there have been numerous surface finds there have been very few excavations of sites with material in primary context, particularly where there has also been associated dating and environmental evidence.

The light soils and open landscape of the Brecklands, river channels and roddons within the Fens appear to be areas particularly rich in Mesolithic activity. Other areas which are currently identified within the region as being of particular interest or importance to the Mesolithic includes estuarine and coastal intertidal zones as well as the ground surfaces sealed beneath peat and alluvium formation.

The Lea valley has also been identified as being of particular importance for the survival of Mesolithic remains and appears to have been a favoured area for settlement (Jacobi forthcoming). Remains of occupation have been found within the organic peat deposits which began accumulating in the area during the Mesolithic period. Such sites have the potential for the survival of organic and environmental evidence. An example of the potential of the Lea valley is the nationally important site at Rikoff's Pit at Broxbourne.

A positive policy is needed for the study and investigation of the Mesolithic and Upper Palaeolithic periods across the region. At present many of the fenland and river valley deposits which have the potential for the excellent preservation of such late glacial and early post-glacial sites are under threat from mineral extraction and other large scale development. In addition, where organic remains survive associated with these sites there is also the threat of dewatering through drainage resulting in the destruction of irreplaceable artefactual, economic and environmental information.

All areas where remnants of late glacial and early post-glacial landsurfaces are preserved have the potential for well preserved Upper Palaeolithic and Mesolithic sites. Areas where subsequent peat formation or deposition of alluvium *etc*. has resulted in the sealing and burial of parts of the landscape.

Areas which have been identified as currently of particular importance or interest for the Mesolithic within East Anglia are the Lea and Colne river valleys and their tributaries, the Crouch estuary palaeochannel, estuarine and coastal intertidal zones particularly in the Wash area and Essex, Breckland, the Fens and areas of alluvium within river valleys.

V. Environment and Economy

by Peter Murphy

The Devensian glacial maximum was around 25,000–18,000BP (Evans 1975, 42), when ice advanced to the North Norfolk coast and the Fen Basin (Bridgland *et al*. 1991). The aeolian Cover Loam of north-east Norfolk and the Cover-Sands of the Breckland were deposited at about this time (Corbett 1973; Tatler and Corbett 1977, 10–11). At Sproughton, Suffolk, Late Upper Palaeolithic artefacts came from a buried soil overlying channel sediments defined palynologically as Zone III–Younger Dryas (Wymer and Rose 1976). Chambers and Mighall (1991) have presented palynological and other palaeoecological data from late glacial sediments at Enfield Lock for an environment dominated by sedges with dwarf birch and arctic willow. Penecontemporaneous sediments at Uxbridge, associated with a long-blade industry, have produced horse and reindeer bone with pollen and soil micromorphological data; significantly vegetational changes inferred from pollen were related to dense bands of charcoal (Lewis *et al.* 1992). At Titchwell, Norfolk, sediments unfortunately appear to post-date a long-blade industry (Wymer 1989).

Devensian periglacial features including pingos (Sparks *et al*. 1972), stripes, polygons, ice-wedge casts (Evans 1972) and amorphous involutions are widespread. The presence of radiocarbon-dated pine charcoal and associated Mesolithic artefacts in the latter (Healy 1988, 104; Murphy 1992) shows that many survived as depressions into the post-glacial, though differentiation from post-glacial tree-throw holes is not always easy.

Palynological information on the developing post-glacial woodland has been provided by Waller (1994), in the fens, and Devoy (1979), Scaife (1988) and Evans (1995) in Essex: as elsewhere in lowland Britain, birch/pine woodland was ultimately replaced by 'climax' lime/oak/elm/hazel woods. More recent work (mostly as yet unpublished) has focused on sedimentary sequences directly associated with Mesolithic and later sites. Lewis *et al.* (1992) present data from Uxbridge indicating Mesolithic activity in an open swampy habitat, with regional pine woodland prevalent in the early to mid Boreal and a succession towards deciduous woodland in the late Boreal. At Boxmoor, Berkhamstead pollen and macrofossils from late Devensian to Flandrian fills of pingos have recently been assessed: basal fills formed in standing water including pollen of birch, with pine, willow and arctic/alpine steppe herbs, and dwarf birch catkin scales, were overlain by sediments formed under birch and then mixed deciduous woodland, with representation of an alder rise (*c.* 8000-7500BP) and the elm decline of *c*. 5000BP (Murphy, Wiltshire, in prep.). A palaeochannel of the River Snail at Fordham had basal fills producing pollen assemblages dominated by herbs, aquatics, birch, pine and hazel-type (Zone IV), overlain by sediments of Zones V and VI in which hazel-type and pine dominated, followed by a local alder rise and development of mixed deciduous woodland in the catchment (Wiltshire, in prep). The fills of a palaeochannel incised into till at Stebbingford produced molluscs, plant macrofossils and pollen indicating infilling probably from Zone IV onwards, with abundant micro-charcoal throughout (Wiltshire and Murphy 1996).

Bennett *et al.* (1990) discuss the significance of high micro-charcoal frequencies in sediments pre-dating 5000BP, concluding that they relate primarily to domestic fires rather than woodland clearance. However, Lewis *et al.* (1992) suggest that dense charcoal deposits in the sediments at Uxbridge may relate to more widespread burning of woodland. Evidence for fires during the Boreal is reviewed by Macdonald *et al*. (1991).

Smith *et al*. (1989) have argued for a pronounced Mesolithic impact on woodland, about 8250BP, at Peacock's Farm, and soil micromorphological data from sites at Borough and Newborough Fens are thought to indicate late Mesolithic disruption of woodland cover (French and Pryor 1993).

Few sites in East Anglia have produced Mesolithic faunal remains, though a bone assemblage dominated by red deer is reported from Uxbridge (Lewis *et al.* 1992). There is virtually no information on the Mesolithic plant economy.

The Mesolithic coastline is discussed by Waller (1994) and Wilkinson and Murphy (1995). There was a rapid rise in relative sea-level in the Mesolithic: between 8500 and 7000BP, MHW rose from -25.5m OD to -8.9m OD (Devoy 1979), resulting in submergence of extensive lowland areas. A significant positive sea-level tendency at around 6500BP is widely distinguishable (Wash I, Yarmouth I, Thames II: Brew *et al.* 1992).

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Neolithic and Bronze Age

by Nigel Brown and Peter Murphy

I. Introduction

A number of accounts of parts of the Five Counties area during the Neolithic and Bronze Age have been published or are forthcoming (*e.g.* Clarke 1960, Hedges 1980, Couchman 1980, Healy 1984, Lawson 1984, Hall and Coles 1994, Holgate 1996, Brown 1996, Ashwin 1996, Malim forthcoming, Pendleton forthcoming). As Bradley (1993) has noted it is important to be aware of links with other areas particularly along the North Sea coast and Thames Valley. Such contacts operated not only within Britain, but also with continental Europe. Important similarities exist between both sides of the North Sea during the Neolithic (*e.g.* Louwe Kooijmans 1976; 1980) and Bronze Age (Smith 1961, Butler 1963, Champion 1994).

The Neolithic and Bronze Age form a convenient block of time for study, from about the 4th millennium BC to the first half of the 1st millennium BC. There are clear similarities and continuities which link the Late Neolithic and Early Bronze Age across the traditional divide of *c.* 2000BC. However, all such divisions are essentially arbitrary, and there are significant differences between aspects of the archaeology of the Early Neolithic and that of the Late Bronze Age. Similarly, consideration of the Neolithic and Bronze Age together, should not obscure the links between the Mesolithic/Neolithic and Bronze Age/Iron Age. For convenience four broad temporal divisions are followed below:-

Early Neolithic 4,000–2,800BC
Late Neolithic/Early Bronze Age 2,800–1500BC
Middle Bronze Age 1500–1000BC
Late Bronze Age 1,000–700BC

This brief account is supported by a lengthy bibliography which includes only works which are published or have a reasonable chance of being published within twelve months. The bibliography is not of course exhaustive, however, most of the works cited also have extensive bibliographies, which should be sufficient to guide the reader through the complexities of the available evidence.

II. Early Neolithic

The East Anglian region has great potential, as yet largely unrealised, for study of the Mesolithic/Neolithic transition (Bradley 1993). The Fens, Fen-edge, river valley bottoms and intertidal zone are all prime locations for recovery of well preserved sites of both Mesolithic and Neolithic date. However, the severe limitations to this potential should not be overlooked (French 1992).

There is some evidence which indicates that Neolithic settlement in these low lying areas followed a shifting pattern, of possibly seasonal occupation, often in the same locations as Mesolithic sites. Plant remains indicate that wild plant resources were at least as important as cultivated ones (Wilkinson and Murphy 1995 and forthcoming). The numerous pit scatters on higher ground, often revealed incidentally during excavation of later sites, can also be interpreted as resulting from repeated re-occupation of the same general location (Healy 1988, Brown 1988a and forthcoming). It is possible that very extensive sites like Broome Heath (Wainwright 1972) and Hurst Fen (Clark *et al.* 1960) may also result from successive re-occupation and/or 'settlement drift'.

The elm decline is generally dated in Britain to around 5000BP, but in East Anglia the date range for this event is wide: *c.* 6010–4650BP (Bennett 1983, Scaife 1988, Waller 1994, table 6.6). Its causes have been much disputed, but Peglar (1993) has presented results from Diss Mere, which give grounds for thinking that human impacts on woodland placed trees under stress so that they were susceptible to disease. Neolithic coppicing is attested at Etton, where coppiced stools were found *in situ* (Pryor *et al.* 1985a; Taylor 1988). Neolithic activity in woodland, not involving clearance, has come from Purfleet, where an immature soil developed on emergent intertidal sediments produced woodland mollusc assemblages and butchered bone of aurochs associated with lithics, including polished axes (Wilkinson and Murphy 1995, 90–8).

In the Fens, two discrete periods of positive sea-level tendency (Wash III/IV, *c.* 5400–4500BP; Wash V, *c.* 4200–3300BP) resulted in deposition of intertidal sediments (colloquially known as the Fen Clay) well inland, though not synchronously everywhere; but subsequently, from about 3300BP there was a seawards extension of freshwater conditions with widespread peat development (Waller 1994, 66–72). The Thames III transgression, beginning about 3850BP, resulted in expansion of the Essex estuaries towards their present margins, widespread submergence of Neolithic settlement sites, and the development of a Bronze Age coastal economy (Wilkinson and Murphy 1995).

The largest collection of Neolithic plant remains is from The Stumble, Blackwater Site 28 (Murphy 1989 and in prep), dominated by emmer wheat, with einkorn, bread wheat, naked barley and flax/linseed, as well as abundant remains of hazelnut, sloe, bramble, rosehip, hawthorn and crab-apple, pointing to substantial reliance on woodland plant foods. Most other Neolithic sites in the region have produced only sparse charred plant assemblages, though sites on the A41 Berkhamsted Bypass have produced useful material (Murphy, in prep.). Acidic soil conditions in many areas place restrictions on the recovery of bone, however the animal bone assemblage from Etton Causewayed Enclosure (Pryor *et al.* 1985a) included evidence for draught cattle.

The potential for the recovery of house structures would also seem high (Darvill and Thomas 1996) on sites preserved beneath alluvium. However, such structures are known in the region only from relatively unprotected sites at for example Fengate (Pryor 1974), Chigborough Farm (Waughman 1989; Wallis and Waughman forthcoming), and possibly Eaton Heath (Wainwright 1973), Spong Hill

Figure 3 Location of places mentioned in text: Neolithic, Bronze Age

(Healy 1988) and Gorhambury (Neal *et al.* 1990). Interpretation of such buildings is difficult, exemplified by the recent suggestion of a non-domestic function for the Fengate structure (Pryor 1988).

The region is rich in flint which was a widely utilised resource up to the end of the Bronze Age (Saville 1995). Lithic scatters reflecting a variety of settlement density and land use strategies have been revealed by survey work throughout the region most notably in the Fens and Fen-edge (Hall and Coles 1994).

Early Neolithic Grimston pottery occurs widely within the region, as it does within Britain as a whole. Other types include plain bowl assemblages, exemplified by the material from Broome Heath, formerly regarded as of Grimston style; Herne (1988) and Cleal (1992) have clearly demonstrated this to be a misattribution. Decorated assemblages of Mildenhall style are widespread (*e.g.* Clark *et al*. 1960, Hedges and Buckley 1978, Healy 1988). This term may be retained for convenience, however it masks considerable variation within the region. The value of the regional styles traditionally used to describe Early Neolithic decorated pottery is increasingly questioned (Cleal 1992).

The monuments of the region are distinctive and often smaller than similar structures elsewhere in Britain. They are considered below according to the traditional classifications, however, it should be noted that distinctions between the various monuments are increasingly blurred, and new types of site which fit uncomfortably within the traditional categories are being recorded (*e.g.* McAvoy forthcoming, Last 1996). Long barrows are few (Ashbee 1970, Lawson *et al.* 1981, Kinnes 1992) but include the potential for the recovery of examples with outstanding preservation as at Haddenham (Hodder and Shand 1988). Long Mortuary enclosures are rather more common (Buckley *et al.* 1988). Cursus monuments are also fairly frequent though not evenly distributed throughout the region (*e.g.* Hedges and Buckley 1981). Traditionally regarded as Late Neolithic, they can now be seen to have Early Neolithic origins in East Anglia, as elsewhere (Barrett *et al*. 1992; Gibson 1994). Ring-ditches and round barrows also have their origins within the Early Neolithic. The most notable is Launders Lane, Rainham, now in Greater London (Hedges 1980) and the early phase of Swale's Tumulus (Briscoe 1959). A ring-ditch producing large quantities of Mildenhall style pottery has recently been excavated at Brightlingsea. The cropmark and excavated causewayed enclosures in the region show considerable variation (Evans 1988, Hedges and Buckley 1978), again there is potential for the recovery of examples preserved beneath alluvium (*e.g.* Pryor *et al*. 1985a). The distribution of monuments shows marked variation within the region (Healy 1984 and 1995), and a variety of monuments appear to cluster at particular locations (*e.g.* Hedges and Buckley 1981, fig. 5; Martin 1994). A most striking example of this occurs in the Ouse valley at Godmanchester Cambs (McAvoy 1991), where the complex includes an unusual palisaded trapezoidal enclosure.

III. Late Neolithic/Early Bronze Age

Settlements of this period are nationally rare, and have long proved elusive; they frequently lack the deep subsoil features which occur in earlier Neolithic sites (Healy 1988). Gibson (1993a) has pointed out the importance of valley floor sites, where settlements of the period may be preserved, and in this respect the potential of the East Anglian region is considerable. Early Bronze Age sites from the Fens and Fen-edge indicate the importance and fragility of the evidence that may be present (Martin 1988; Martin and Murphy 1988; Hall and Coles 1994). Ditched field systems have been revealed at a number of locations (Bradley 1993). Substantial fragments of a settlement including a house and field boundaries have been revealed at Sutton Hoo, preserved beneath later earthworks (Copp 1989; Hummler 1993).

In the later Neolithic, results from East Anglian pollen sites, as elsewhere in Britain, point to woodland regeneration (Scaife 1988; Waller 1994; Whittle 1978). Neolithic pits from Hunstanton and Baldock have produced woodland/scrub snail assemblages (Murphy 1990a, 1993), whilst at Rectory Farm, Godmanchester a Late Neolithic pit, cut into the junction between ditches of an Early-Middle Neolithic enclosure and a cursus, (McAvoy forthcoming), has produced palynological, insect and plant macrofossil data indicating wooded conditions (Murphy, Robinson, Wiltshire, in prep.). Charcoal spreads mostly dating to around 4000BP on palaeosols under estuarine sediments on the Essex coast may relate to localised burning of woodland (Wilkinson and Murphy 1995). River valley alluviation is generally a later phenomenon, though soil erosion and alluviation following clearance in the earlier Neolithic is reported in the lower Welland valley (French 1990; French *et al*. 1992).

In Fenland, sustained Bronze Age impacts on woodland are marked palynologically by a lime decline in the south-eastern Fens and at Holme Fen (Waller 1994), though at low elevations the lime decline may have been more closely related to rising ground-water levels (paludification) than to human activity. Pollen analysis of a buried soil under a complex barrow at Deeping St Nicholas indicated proximity of a Bronze Age pastoral landscape, with some evidence for cereal cultivation (Scaife 1994). Settlement in an open landscape is indicated at West Row Fen, *c*. 3650BP (Martin and Murphy 1988). In the River Snail palaeochannel at Fordham, a very marked decline in alder pollen and a contemporaneous decrease in % loss on ignition of sediments relates to progressive clearance and increased minerogenic alluviation in the Bronze Age (Wiltshire, in prep). Charcoal, plant macrofossils and molluscs point to activity within valley floor alder woodland, related to production of abundant heat-shattered flint (Gale, Murphy, in prep). At Godmanchester, pollen and macrofossil data show that the wooded conditions associated with a Late Neolithic pit had been replaced by open landscapes by 3240 50BP (GU-5213: CAL BC, [2 sigma], 1671–1420).

At Hunstanton, a pig-dominated Later Neolithic bone assemblage probably reflecting exploitation of woodland pannage, with cattle, sheep/goat, deer and dolphin and a small Early Bronze Age sheep/goat-dominated assemblage have been recovered (Jones 1993). At West Row Fen, the Early Bronze Age bone assemblage comprised mainly short-horned cattle and Soay-sized two-horned sheep with goats, horse, pigs, dogs and a minor component of wild species. Cattle seem to have been used principally for draught, whereas sheep and goats were being milked (Olsen 1994). Marine food

Plate II How Hill in Icklingham, Suffolk, an Early Bronze Age burial mound. *Photo: Edward Martin*

resources were exploited where available as they were during the Middle and Late Bronze Age (Murphy 1993, 1994, 1995): at Deeping St Nicholas, three oysters were placed with a Bronze Age cremation in a cist.

The extensive flint extraction site at Grimes Graves is outstanding. Whilst research has focused on the Grimes Graves complex, this site is only the most conspicuous end of a spectrum which ranges through smaller mine, quarry and grubbing-out sites, some of them long-known but neglected, like the Norfolk sites of Great Massingham (Plowright 1891), Great Melton (Clarke and Halls 1918) or Ringland (Clarke 1918). Transport of surface flint from the Breckland to the adjoining relatively flint-poor area of the Fen edge also took place (Healy 1991). The Royal Commission's current survey of flint mines is locating and defining some of the neglected industrial sites. Some aspects of their working and their products have been defined (Saville 1981; Healy 1984, 199), although much remains to be clarified, especially the wider context in which such sites were exploited.

It is clear too that particular flints were consistently selected for the manufacture of axes, which tend to be of different materials from most of the industries in which they occur. Many are of flints far more likely to come from till than *in situ* chalk sources, for example the pale grey flint of the polished axes from the West Stow ring-ditch (Pieksma and Gardiner 1990) and the tortoiseshell-like mottled orange flint of many Fenland axes (Healy 1991). The consistent selection of these materials in the tills may be related to the use of non-flint erratics for stone axes, as well as for objects like pebble-hammers, rubbers and querns (Green 1988). Till deposits in the region and the manner, extent and context of their use remain understudied in comparison to remote sources of stone implements.

Pottery of the period is remarkably varied. Peterborough Ware is now seen to begin much earlier than hitherto supposed (Gibson 1993b). Grooved Ware may have fairly early beginnings (*e.g.* Kinnes 1985, fig. 4) and radiocarbon dates for Grooved Ware in East Anglia are frequently early (Cleal 1984, Bradley *et al*. 1993). Beaker pottery is well represented in the region (Clarke 1970; Cleal 1984) both from funerary and settlement contexts, notably on the Fen edge (Bamford 1982; Healy 1995). Whilst some classic Early Bronze Age pottery styles such as Collared Urns (Longworth 1988) are widespread, albeit with some marked concentrations, others such as Food Vessels have a much more restricted distribution. These vessels are relatively common in the north of the area (Lawson 1984), but are virtually absent in the south (Couchman 1980). East Anglia is one of the few regions where Collared Urns have been recovered from settlement contexts — notably at West Row Fen. Something of the complexity of the settlement evidence and its attendant pottery is described and discussed by Healy (1995).

Early metalwork also shows marked regional differences being relatively common in the north of the region, with a variety of different objects, whereas in the south there are few metalwork finds, mostly of axes (Couchman 1980, Lawson 1984, Pendleton forthcoming). The dense concentration of finds just outside the Five Counties area in the west of the Greater London region may be relevant here (Needham 1987).

Henge monuments are most famously represented by Maxey (Pryor *et al.* 1985) in the west of the region, with a wide range of cropmark sites in Cambridgeshire (Harding and Lee 1987). In the east of the region, a range of possible, mainly small, henges are known from cropmarks (Harding and Lee 1987; Martin 1982;1994). However, few have been dated by excavation, the classic exceptions being Arminghall (Clark 1936) and the site at Lawford

(Shennan *et al*. 1985). The presence of Grooved Ware and Beaker deposits at many causewayed enclosures (*e.g.* Hedges and Buckley 1978, Pryor *et al*. 1985), indicates that these monuments continued in use. Activity at Springfield cursus continued throughout the Late Neolithic and Early Bronze Age (Holgate 1996; Brown forthcoming). Long barrows by contrast may broadly have gone out of use, although in some cases deposits were still occasionally made at them (Ashbee 1970). Burial evidence is increasingly focused on round barrows. An early example is the Late Neolithic ring-ditch at West Stow, with numerous cremation burials (West 1990). Round barrows proliferate during the Early Bronze Age (Lawson *et al*. 1981), continuing into the later Bronze Age. Many examples have been excavated throughout the region particularly in Norfolk (*e.g.* Lawson *et al*. 1986; Wymer 1996) and whole barrowfields have been recorded emerging from the eroding peat of the Fens (Hall and Coles 1994). Burials are also known as apparently isolated finds in the Fens (Healy and Housley 1992), and human remains have also been recovered from settlement sites (Martin and Murphy 1988).

IV. Middle Bronze Age

The Five Counties region displays a marked contrast in the range of settlement evidence currently available (*e.g.* Ashwin 1993, Brown 1988a and 1996). This is particularly clear in the Late Bronze Age, but is also apparent for the Middle Bronze Age.

In the south of the region, in Essex, there is extensive, if fragmentary, settlement evidence mostly in the southern half of the county (Brown 1996). This is predominantly of the kind described by Jones and Bond (1980) at Mucking, although the Mucking field system remains exceptional. The most complete settlement plan has been obtained from North Shoebury (Wymer and Brown 1995). Wells are a feature of many Middle and Late Bronze Age settlements in this area (Adkins *et al.* 1984–5; Brown 1988 and 1996; Wallis and Waughman forthcoming). In the north-west of the region there is the extraordinary Fengate/Flag Fen complex, with the large wooden platform at Flag Fen linked by a post alignment to the Fengate ditched field system. This complex began in the Middle Bronze Age and remained a focus of ritual deposition into the Iron Age (Pryor 1992). In the north-east of the region, in Norfolk, settlement evidence is largely lacking (Lawson 1984; Ashwin 1993; 1996). The obvious exceptions are the large quantities of domestic debris, and useful range of environmental data, from the upper fills of the Grimes Graves mine shafts (*e.g.* Mercer 1980; Longworth *et al*. 1988). This general lack of settlement evidence has led to the suggestion that there may be differential settlement development within the region (Healy 1993). This kind of variation in settlement distribution can be seen at a more local level within the region. Thus the settlement evidence from south Essex does not extend into north-east Essex/south-east Suffolk. Here, in the area of the Ardleigh Group, settlement sites are largely lacking (Brown 1996), although a trapezoidal palisaded enclosure recorded at Sutton Hoo may be of Middle or Late Bronze Age date (Hummler 1993).

Deverel-Rimbury pottery is now the classic pottery of the Middle Bronze Age; however, there is no simple progression of ceramic styles. The highly decorated Ardleigh Group (Erith and Longworth 1960), arguably the most famous version of Deverel-Rimbury pottery from the region, can now clearly be seen to belong as much to the Early Bronze Age as the Middle Bronze Age (Longworth *et al*. 1988; Brown 1995; Healy 1995). There is a fairly neat distinction between the distribution of Ardleigh style urns and Biconical urns within the region (Longworth *et al.* 1988). To the south of the Ardleigh group the Deverel-Rimbury pottery is quite distinct (Brown 1995) and can be seen as part of Ellison's Lower Thames Group. This is most graphically demonstrated by the distribution of some remarkable stamp-decorated bowls which are known from Birchington in north-east Kent (Powell-Cotton and Crawford 1924; O'Connor 1980), North Shoebury in south-east Essex (Brown 1984–5; Wymer and Brown 1995) and Sipson Lane, Middlesex (Cotton *et al.* 1986).

Metalwork finds (Rowlands 1976) also show marked variation across the region, with many finds in the north, and rather fewer in the south (Lawson 1984). This pattern is particularly striking with regard to ornaments, which are relatively common in Norfolk and Suffolk (Lawson 1984; Pendleton forthcoming) and virtually absent in Essex (Couchman 1980). There are also similar variations in the distribution of other types of metalwork, on a smaller scale within the region (Lawson 1984). Burial evidence is dominated by cremations either in urns or unaccompanied, often, but not always, focused on either earlier or contemporary round barrows. In north-east Essex there is a remarkable series of cemeteries characterised by tight clusters of numerous ring-ditches, with burials often placed between rather than within the ring-ditches (Brown 1995; 1996).

Graphic reminders of the importance of rivers and estuaries within the area, and of the potential for contacts across the North Sea, are the finds of a complete paddle from the Crouch estuary (Wilkinson and Murphy 1995) and a boat from Dover, just outside the Five Counties Region. It is from this period that details of the agricultural economy begin to proliferate (Murphy 1984; 1996). There is also evidence of the growth of other forms of production; loomweights become frequent finds and salt production is known from Fenn Creek (Wilkinson and Murphy 1995). At Grimes Graves a Bronze Age cattle dairying economy has been suggested (Legge 1981). Planned field systems on the Fen-edge at Fengate and elsewhere (Peglar and Wilson 1978; Pryor 1988; Wiltshire and Murphy 1993). The development of the Fengate system, its demise due to rising groundwater levels and the expansion of the Flag Fen basin, and associated landscape and vegetational changes are discussed by French (in press). In the Waveney valley at Scole, pollen analysis indicates major clearances of lime/oak/hazel woodland at 3140 ± 50BP (OxA-6102: CAL BC, [2 sigma], 1530–1300) (Wiltshire, in prep). Evidence for Bronze Age woodland management has been provided by intertidal wooden structures (Wilkinson and Murphy 1995, 132–152), whilst data on timber utilisation have come from Flag Fen (Taylor and Pryor 1990). On the Boulder Clay Plateau at Stansted, palynological studies indicate a reduction of tree pollen, and particularly lime, around 3350BP, and intensification of clearance associated with arable farming from about 3000BP (Wiltshire 1991). These trends continue and develop throughout the Late Bronze Age.

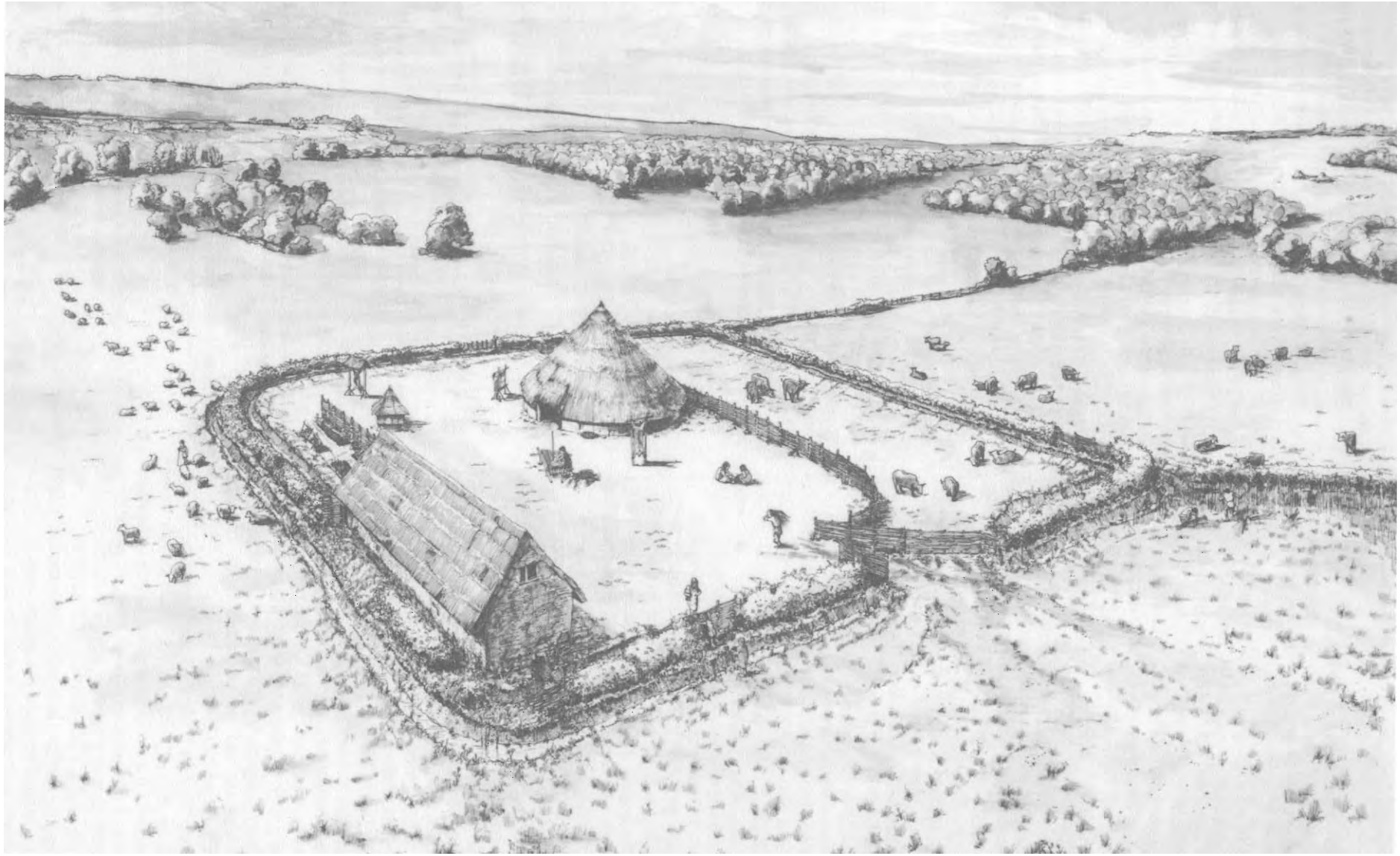

Figure 4 The Late Bronze Age enclosure at Lofts Farm, Essex, as it may have appeared in the 9th century BC. Artefact distributions indicate that the rectangular building functioned as a longhouse, with people at the west end and animals to the east. Plant remains and pollen indicated a locally open landscape of damp grassland, and a primarily pastoral economy. *Drawn by Roger Massey-Ryan, copyright Essex County Council*

V. Late Bronze Age

Spelt wheat was introduced during the Bronze Age in addition to cultivated plants present in earlier periods. The earliest reliable records appear to be from pits at Godmanchester, *c.* 3240BP (see above). It was a significant or predominant crop at the Late Bronze Age sites at Springfield Lyons, Chelmsford and Lofts Farm, Heybridge (Murphy 1988;1990). Emmer, bread wheat, naked and hulled barley, horse beans, peas, flax/linseed and opium poppy are also recorded from later Bronze Age sites. There is clear evidence for extensive later Bronze Age pastoral and arable landscapes on the Chelmer and Blackwater terrace gravels. At Rectory Farm, West Deeping, macrofossils of dogwood, hawthorn, bullace, sloe, bramble and elder, with the woodland herb three-nerved sandwort, have recently been recovered from a Late Bronze Age field ditch, indicating that it was hedged (Murphy and Fryer, in prep.).

The range of settlement evidence available displays an even more marked variation than that of the Middle Bronze Age. In the north-east of the area in Norfolk there is still a distinct lack of settlements (Lawson 1984; Ashwin 1993) and the evidence from Suffolk is currently also rather sparse (Martin 1993). By contrast in the south of the region in Essex a wide variety of settlement evidence (*e.g.* Brown 1988a; Brown and Lavender 1994) both enclosed (Buckley and Hedges 1987; Brown 1988a; Bond 1988) and unenclosed (Brown 1988b) is known. These sites have provided an array of domestic, storage, and other structures (Brown 1988a, b and 1996), together with a wide variety of economic and environmental data (Brown 1996 and Murphy 1996). Unenclosed settlement has also been recorded at a number of locations in the south and west of the region *e.g.* Wicken, Cambs (Bray 1993), Foxholes, Cole Green and along the Berkhamsted/ Kings Langley Bypass, Herts (Bryant 1995; McDonald 1993). Survey of the intertidal zone of the Essex estuaries and adjacent land has revealed a range of wooden structures derived from a variety of activities, and dated to the Middle Bronze Age, Late Bronze Age and Early Iron Age (Wilkinson and Murphy 1995; Meddens 1996). Of the known settlements, most striking are the circular enclosed sites of which a number are known in Essex (Buckley and Hedges 1987; Brown 1996). These sites have a distribution in eastern England from Kent to Yorkshire (Champion 1980; Needham 1993). They show a marked variation in internal arrangements (Brown and Lavender 1994; Needham 1993), particularly so if the circular enclosures at West Harling are included (Bradley 1984; Needham 1993). In the north-west of the region the extraordinary complex of preserved wooden structures at Flag Fen/Fengate and its associated metal finds are outstanding (Pryor 1992).

Pottery of the Late Bronze Age displaying the features described by Barrett (1980) is now well known in the region. Much of the evidence is derived from settlements in the south of the region (*e.g.* Bond 1988; Brown 1988 a, b and 1996). Smaller groups are known from further north in East Anglia (*e.g.* Lawson 1983; Martin 1993).

During the Late Bronze Age, field monuments, which might be separated from the domestic sphere as in some senses henges and cursuses appear to have been in the Neolithic, appear to be absent. However, as the Flag Fen structures clearly indicate, monumentality was not absent. Rather it appears more closely integrated with domestic sites, as the circular enclosures clearly demonstrate (Needham 1993; Brown and Lavender 1994). Burials are rare, as they are nationally, although some are known (Needham 1995) and there is some evidence to indicate that barrows were still occasionally constructed (Brown 1996). There is evidence from outside the Five Counties region for the occurrence of human remains on settlement sites (Needham 1993), in the manner now well known in the Iron Age.

Metalwork of the period is widespread (*e.g.* O'Connor 1980; Lawson 1983; Couchman 1980; Pendleton forth-coming). Finds are dominated by Ewart Park Phase metalwork, the earlier Wilburton phase material is much rarer as it is in adjacent areas (Needham 1987). A notable exception to this pattern is the vast Isleham Hoard, which appears to date from the end of the Wilburton phase. A number of sites within the region have produced fragments of casting moulds for bronze production, notable amongst these are the circular enclosures (Needham 1993), one of which, Springfield Lyons, has yielded a huge array of mould fragments.

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Iron Age

by Stewart Bryant

For the purposes of this review, the Iron Age has been divided into two sub-periods:

The Late Bronze Age/Early Iron Age transition and the Early Iron Age (800–400/300BC)

The later Iron Age (400/300BC to AD50)

In addition, a further sub-division has been made for some aspects of settlement and artefacts, between the Late Bronze Age/Early Iron Age transition (800–600BC) and the Early Iron Age (600–400/ 300BC).

I. The Late Bronze Age/Early Iron Age Transition and the Early Iron Age (800–400/300BC)

Artefacts

The beginning of this sub-period is marked by the ending of bronze hoards and the deposition or discard of metalwork on settlements (see also Brown, this volume). This provides a reasonably distinct chronological horizon in Essex and Hertfordshire at the end of the 8th century (Burgess and Needham 1980). There is however evidence that hoarding in the Fens, Norfolk and Suffolk continued slightly later (Thomas 1989).

After the 8th century, apart from the occasional item of metalwork, artefacts which can be dated securely to points within this sub-period are generally rare within the region. Pottery assemblages are dominated by flint-gritted wares, the majority of which are coarse ware jars. The forms and fabrics tend to be long-lived and in some parts of the region persist well into the later Iron Age (see below and Barrett 1980; Saunders 1972; Bryant 1995; Davies 1996; Sealey 1996, 47). Decoration of this group, where it occurs, is mostly restricted to cabling and finger-tipping around the shoulder and rim.

The fine wares comprise thinner-walled forms which frequently have burnished surfaces, and in contrast to the coarse wares, vary across the region, both in terms of their form and their chronological development (Bryant 1995 18–21; Davies 1996; Sealey 1996). However, in the transitional Late Bronze Age/Early Iron Age period (*c*. 800–600/500) the fine wares show a broad stylistic similarity, with each site displaying minor variations of vessel form. It is only from about 600/500BC that the distinctive and characteristic Early Iron Age fine ware localised styles are clearly recognisable in some parts of the region (N. Brown pers comm.). The most notable of these are the carinated and decorated bowls of the Chinnor/ Wandlebury style (Cunliffe 1978, 39) which occur in the Chilterns and south Cambridgeshire from about 500 to 300BC. The bowls also frequently have foot-ring or pedestal bases and were clearly influenced by the contemporary vase carines pottery of the Marne area of France (Bryant 1995, 21). Examples of closer and more faithful copies of the elegant vase carines style angular pots have also recently been found at Fordham, Cambridgeshire (J. D. Hill pers. comm.).

In Essex, Suffolk, Norfolk and North Cambridgeshire, Early Iron Age fine wares are represented by the plainer angular bowls of the Darmsden style (Cunliffe 1968; Cunliffe 1978, 39; Davies 1996) and the distinctive West Harling style carinated bowls. The latter are generally less common than the Darmsden bowls but are nonetheless present in a number of pottery assemblages from Norfolk and Cambridgeshire (J.D. Hill pers comm.). The Darmsden bowls appear to have a longer currency than the Chinnor/Wandlebury bowls and recent evidence has suggested that they probably originated in the Late Bronze Age (Brown 1988a, 272; Sealey 1996, 47; Martin 1993). Late Bronze Age origins for the West Harling bowls is also indicated by their association with a Halstatt C razor at Hills Road, Cambridge (J.D. Hill pers. comm.). Although the accurate dating of most sites within the sub-period is problematical (within 150–200 years), it is possible to make a crude distinction between those sites with pottery assemblages which include distinctive fine wares (the period from *c*. 600/500 to 300BC), and those sites which either do not have fine wares or which include fine wares which are not locally distinctive (the period from *c*.800 to 600/500BC). However, even this very general and crude division is at present problematic for the areas which do not posses easily classifiable Early Iron Age fine wares such as parts of Norfolk and southern Hertfordshire.

It is likely that most pottery in the region was produced locally within 10 kilometres of the home base (Morris 1996, 41). This is particularly the case with the coarse wares which form the bulk of most assemblages. It is however possible that some of the East Anglian Early Iron Age fine wares were exchanged over longer distances, in the same way that some of the contemporary haematite-coated and scratched-cordoned bowls from Wessex were (Morris 1996). The characterisitics of the East Anglian fine wares — the clays, tempering and decoration — make the location of production sites by techniques such as petrological analysis and the detailed study of finishing techniques more problematic than is the case with Wessex. However, the detailed examination of the evidence for the long-distance exchange of fine wares in East Anglia is a potentially fruitful area for future study in the region.

Settlement Patterns

The Late Bronze Age/Early Iron Age Transition (c. 800-600/500BC)

Current evidence suggests that the distribution of settlement across the region at this time was sporadic, with locally distinct clusters of sites occurring on the lighter soils along the river valleys and the Fen-edge. There is also some evidence of limited colonisation of the edges of the extensive boulder clay areas of the region (see below).

In Hertfordshire, a number of sites are known from the Chilterns including Blackhorse Road, Letchworth (Moss-Eccardt 1988), the Weston Hills, Baldock (Hutchings and Richmond 1995); Whiteley Hill (Bryant 1994); Wilbury Hill (Applebaum 1949); Gadebridge (Bryant 1995, 19)

Figure 5 Location of places mentioned in text: Iron Age

and the Bulbourne valley sites of Bottom House Lane, Crawleys Lane and Pea Lane (McDonald 1995a). Settlements are also known from the valley of the river Lea at Cole Green in Hertford (McDonald forthcoming), Foxholes (Partridge 1989) and Turnford (Bryant 1995, 19).

In Suffolk, sites dating to the Late Bronze Age/Early Iron Age transition also appear to be concentrated on the lighter soils and along the principal river valleys. In particular, a recent study of the sandy Breckland soils has demonstrated a relatively dense concentration of settlement evidence (Sussams 1996). In Essex there is also clear evidence for extensive arable and pastoral landscapes in the Chelmer and Blackwater terrace gravels, continuing on from the Late Bronze Age proper (Brown, this volume; Martin 1988, 68; Brown and Lavender 1994; Wiltshire and Murphy 1993). Few settlements are so far known from Norfolk although the Breckland area to the east of Thetford, at the southern edge of the county, appears to have favoured settlement of this period (Davies 1996, 67) including the site at West Harling (Clark and Fell 1953). The distribution of sites in Cambridgeshire indicates that clusters of settlements existed where the major rivers entered the Fens (J.D. Hill pers comm.). Sites are known from the Fen-edge at Langwood Farm West (Evans 1995) and Wicken (Bray 1992). Settlement can also be reasonably inferred from the activity at the Flag Fen ritual complex and the presence of planned field systems at Fengate (Pryor *et al.* 1992). In addition to the Fen-edge clusters, evidence is beginning to accumulate for settlement along the Ouse Valley from sites such as Brampton in Cambridgeshire (Malim and Mitchell1993).

There is now a significant body of evidence from Hertfordshire and Essex for an expansion of settlement along the edges of the boulder clay plateau during the Late Bronze Age/Early Iron Age transition. Recent excavation at Thorley near Bishop's Stortford on the Hertfordshire Essex border (McDonald 1995b) and at Stansted and Broads Green in Essex (Brown 1988b), have produced evidence of substantial settlements. There is also evidence from pollen at Stansted for an intensification of tree clearance associated with arable farming from about 3000BP (see V below and Wiltshire 1991).

In addition, there is some evidence for settlement on the Suffolk clay lands. Sites producing flint-gritted wares — which could date from the later Bronze Age to the later Iron Age — are known from the edges of the boulder clay plateau in parts of Suffolk (E. Martin pers. comm.). The distribution of later Bronze Age flint and metalwork on the Suffolk clay lands also suggests that significant settlement was occurring from the Late Bronze Age at approximately half the density known on the lighter soils (C. Pendleton pers comm.).

The Early Iron Age (c. 600–400/300BC)

Evidence from the region indicates that the settlement pattern in the Early Iron Age was probably similar to that of the preceding Late Bronze Age/Early Iron Age transition, with a concentration on the lighter soils and along the river valleys, and with some exploitation of the boulder clay areas.

In Essex there is an interesting local pattern with a marked concentration of Early Iron Age sites around the Blackwater Estuary which contrasts with an apparent absence of settlement in the adjacent Chelmer valley (Brown 1996, 33). This may be an example of the more general pattern of local clustering of settlements in the region during the later Bronze Age and Early Iron Age (J.D. Hill pers. comm.).

In Hertfordshire, a number of Early Iron Age sites are known from the Icknield Belt of the Chilterns (Matthews 1976; Bryant 1995, 20–21) and a possible further expansion of settlement along the edge of the boulder clay is indicated at Stansted in Essex (Brown 1996, 33). There is also evidence for an increase in settlement activity on the Fen-edge in Norfolk, Suffolk and Cambridgeshire during the Early Iron Age (Evans 1992).

In Suffolk, the settlement pattern is also generally the same as it is for the Late Bronze Age/Early Iron Age transition with some extensive Iron Age linear settlements which include Early Iron Age material recently revealed along the edges of the Gipping and Finn valleys, adjacent to the boulder clay (E. Martin pers. comm.) There is some evidence of exploitation of the lighter soils of the Brecklands and Sandlings in Suffolk during the Early Iron Age, although this is generally restricted to those areas which are within easy reach of water (Martin 1988, 68). This is also supported by pollen evidence which indicates that substantial clearance was taking place from about 2500BP (see below and Bennet 1983).

In Norfolk, as with the Late Bronze Age/Early Iron Age transition, the quality of the evidence is generally poor, although there is more of it and there are signs that the settlement pattern had become more firmly established (Davies 1996, 67). A site is also known in the north west of the county at Redgate Hill, Hunstanton (Wymer 1986). Andrew Rogerson's recent detailed study of two areas of West Norfolk has revealed a significant contrast in terms of the density of Iron Age sites, between the clay areas — which have few sites — and areas off the clay — which have a much higher settlement density (Rogerson 1995).

Settlement Morphology

The majority of settlements which are known from the region are unenclosed (Champion 1994, 131). The relatively high visibility of enclosed sites from aerial survey in comparison with unenclosed sites tends to reinforce the impression that most were unenclosed. Typically the open settlements consist of post-built round-houses, two and four-post structures and pits. They also usually cover more than one period of occupation, and are spread over a relatively large area. Published examples include Foxholes (Partridge 1989) and North Shoebury (Wymer and Brown 1995). However, most sites are only known from relatively recent excavations, and consequently few have yet been published (information from County SMRs; Bryant 1995, 17–21; Davies 1996)

The predominance of open sites in the later Bronze Age and Early Iron Age is a notable feature of East Anglia which contrasts with some other regions, especially Wessex, where unenclosed sites tend to be the norm (Hill 1996; Collis 1996). However, a small number of Late Bronze Age enclosed sites are known from the region. The class of Late Bronze Age circular enclosures represented by Springfield Lyons (Buckley and Hedges 1987), Mucking South Rings (Jones and Bond 1980), Great Baddow (Brown and Lavender 1994) and Whiteley Hill, Herts (Bryant 1994) is now well known (see Brown, this volume and Brown1996, 30). The settlement at West Harling, Norfolk is situated within an oval enclosure

(Clark and Fell 1953), that at Lofts Farm within a rectangular enclosure (Brown 1988a) and a 'D' shaped enclosure is known at Broomfield, Chelmsford (Atkinson 1995b). The Late Bronze Age ringwork sites do not on current evidence appear to have continued into the Early Iron Age when enclosed sites seem to have been even rarer except for a few hillforts (see below).

Ritual and Burial

The deposition of inhumations within settlements, either as complete bodies or as fragmentary remains, occurs in the region from the Late Bronze Age and continues throughout the earlier Iron Age, although the number of burials does not appear to be as high as in Wessex or the Upper Thames Valley (Whimster 1981; J.D. Hill pers comm.). Where they are present, the human remains are also typically associated with animal remains and other specially placed deposits (J.D. Hill pers comm.). Examples of complete inhumations from the region include a crouched burial from a storage pit at North Shoebury, Essex (Wymer and Brown 1995), a crouched burial from Southend Airport (Holgate 1996) and two crouched burials, one with a chalk plaque and one with two iron beads, from a shaft at Grimes Graves, Norfolk (Mercer 1981, 16–18).

Cremations also occur occasionally in the region during the later Bronze Age/Early Iron Age, usually as unaccompanied urned or un-urned burials. Five un-urned cremations were recovered from small pits at the Late Bronze Age site at Broads Green, Essex. Four of the cremations were also located close to a small rectilinear structure which may have been a shrine (Brown 1988b). Several urned cremations of Late Bronze Age date are known at Lakenheath in Suffolk (Needham 1995) and an example of a small cemetery of un-urned cremations situated adjacent to a settlement was recently excavated at Gadebridge, Hertfordshire (Herts SMR: 7981).

II. The Later Iron Age (400/300BC–AD50)

Artefacts

Pottery

The transition from the Early Iron Age to the later Iron Age is marked by a general change across most of the region in pottery styles and manufacturing techniques. The widespread use of flint as a tempering material, which had been taking place for possibly one thousand years in some parts of the region, was gradually replaced by sand and shell. More rounded profiles were also adopted in place of the angular forms of the Late Bronze Age and Early Iron Age pottery (Bryant 1995, 21–22; Davies 1996; Sealey 1996, 50). However, the chronology of this change cannot be demonstrated with any degree of precision and is likely to vary within the region between 400 and 300BC. Also, in parts of Suffolk it seems likely that Early Iron Age pottery styles continued to be made well into the later Iron Age, and at Burgh in Suffolk an unabraded sherd of pottery of Early Iron Age type was even found alongside Gallo-Belgic and Roman pottery (Martin 1988, 39 no.28).

In Norfolk and the northern parts of Suffolk and Cambridgeshire, there is a general conservatism in pottery manufacture and use during the later Iron Age, with hand-made sand and shell tempered forms continuing in some areas into the 1st century AD and the Roman period. This means that pottery is of limited use as a dating tool, and other datable artefacts are also rare on sites in this part of the region until the 1st century AD. The dating of most later Iron Age sites before the appearance of Roman pottery and brooches is therefore problematic at present.

In Hertfordshire, Essex and south Suffolk, wheel-thrown pottery appears to have been adopted during the 1st century BC, although the date of its introduction into the area is still not known with any precision. Datable imports also occur occasionally with burials and on occupation sites from the early 1st century BC. An imported Dressel 1a amphora dating to the early 1st century BC accompanied a Welwyn burial at Baldock (Stead and Rigby 1986, 53), and fragments of similar amphora are known from Gatesbury, Braughing (Partridge 1980, 113), the Airport Catering site at Stansted (Sealey 1996, 51) and Elms Farm, Heybridge (Sealey 1996, 50).

Towards the end of the century the importing — and copying — of significant quantities of pottery from Gaul together with the widespread appearance of datable brooches, also allows a relatively fine degree of chronological resolution for most later Iron Age sites within the area. It is possible therefore that the period of use of sand and shell tempered pottery was relatively short in some parts of Hertfordshire and Essex, and within Hertfordshire sites producing this type of pottery are relatively rare at present (Bryant and Niblett forthcoming).

The situation regarding the adoption of wheel-thrown pottery in Cambridgeshire appears to be less straightforward. At Wardy Hill, Coveney, 80% of a large assemblage dating to the first half of the 1st century AD comprised hand-made forms. However, these were also mixed together with wheel-thrown forms indicating that they continued to be made at the same time as the wheel-thrown forms were being used (Evans 1992b; J.D. Hill pers comm.). A similar situation may also be occurring at Werrington (Mackreth 1988) and at Hinxton in south Cambridgeshire, wheel-thrown pottery was being used for burial urns during the 1st century BC (Alexander and Hill 1996) whilst contemporary domestic settlements continued to use hand-made forms (J.D. Hill pers comm.).

These examples suggest that the adoption of wheel-thrown pottery and other Late Iron Age cultural elements may have been a complex process, with traditional practices occurring alongside the new innovations. That the adoption of wheel-thrown pottery was not a uniform process, especially on some rural sites, is demonstrated by a ditch at Wendens Ambo in Essex, which contained hand-made pottery alongside imported Roman forms but did not produce any local wheel-thrown wares (Hodder 1982, 10–11).

Research combining settlement and artefact studies together with numismatics is likely to be the best method of understanding the processes involved in the adoption of 'Aylesford Swarling' cultural elements. The potential for this approach has been demonstrated recently by Edward Martin for Suffolk, where the division between the north and south of the county in terms of the adoption of cremation burial and imported pottery is particularly marked (Martin 1988, 68–73). This almost certainly reflects the cultural differences between two of the major later Iron Age tribes of the region; the Iceni — whose territory is known to have included Norfolk and north Suffolk, and the Trinovantes — whose tribal territory is known to have included Essex and south Suffolk. The

validity of this tribal division of Suffolk is also reinforced by the distribution of Icenian and Trinovantian coins and the characteristic Icenian horse harness fittings (Martin 1988).

Coinage and metalwork

East Anglia is noted for its later Iron Age coinage, which provides one of the most important sources of evidence for the period. This has been emphasised by recent reviews of the evidence (Haselgrove 1987; 1993; 1996) and by Martins' analysis of the evidence for Suffolk (Martin 1988, 70). The region is important for understanding all three of the chronological phases of Iron Age coinage identified by Haselgrove (1996). In particular, it has produced some of the earliest imported and locally produced British coinage, including a large proportion of the early cast bronze 'potin' coins, and is probably the most important region for the study of inscribed coinage (Haselgrove 1996).

The region also contains some of the most important sites for excavated coin finds including four of the seven sites in Britain which have produced more than one hundred coins: Baldock, Braughing, Colchester and Harlow (Haselgrove 1996). The potential of excavated coins has been highlighted by Haselgrove (1987; 1996) who has shown that they can be used, amongst other things, to attest shifts in settlement occupation, provide information on the status of sites and contribute to the understanding of coinage circulation patterns (Haselgrove 1987; 1996).

A number of finds of Iron Age metalwork are known from the region, mostly dating from the 1st century BC. Ornamental horse harness fittings and the decorative chariot fittings known as 'terrets' are widely distributed within the tribal area of the Iceni in Norfolk and north Suffolk (Martin 1988, 68; Davies 1996). Likewise, the large numbers of gold and silver torcs from Norfolk and Suffolk can also be identified with the Iceni (Davies 1996, 72).

There are a number of metal vessels from the Fen-edge and the marshes on the Norfolk/Suffolk border (J.D. Hill pers comm.). A small number of Late Iron Age swords and fragments of swords and scabbards have been found, including several from the south east Fen-edge near Peterborough (J.D. Hill pers comm.), a La Tène II sword from Stoke Ferry, west Norfolk (Davies 1996, 73), a La Tène III sword from Springfield Lyons (Stead 1987) and a La Tène III weapon hoard including swords from Essendon in Hertfordshire (Esmonde Cleary 1995; Stead pers comm.). A Late Iron Age sword fragment was also found together with an important hoard of twenty-three Late Iron Age blacksmithing tools in a former course of the River Lea at Waltham Abbey in 1967 (Sealey 1996, 58).

The fact that most of these metalwork finds are from wet or watery contexts and do not appear to be associated with settlements indicates that they were probably deposited as ritual or ceremonial offerings.

Ritual and Burial

The burial rite of cremation was introduced into the region probably during the later 2nd/early 1st century BC. The earliest cremations in the region on current evidence appear to occur in Hertfordshire and south Cambridgeshire from sites such as Baldock (Stead 1987) and the recently excavated site at Hinxton in Cambridgeshire (Alexander and Hill 1996). However, the rite does not appear to have spread to Essex until after 50BC (Sealey 1996, 57–8), and to the rest of the region until probably the late 1st century BC or the early 1st century AD.

Where present, Late Iron cremation burials can provide evidence of social stratification, ritual and ceremonial practices and the emergence of a wealthy elite. The wealthiest burials, including those previously known as the 'Welwyn Type' (Stead 1967) and also including those recently excavated at Folly Lane (St Albans) and Stanway (Colchester) (Niblett 1992; Crummy 1993), together form one of the most important groups in Western Europe. The region also includes a large proportion of the national sample of Late Iron Age burials including the cemeteries at King Harry Lane (Stead and Rigby 1989) and Verulam Hill Fields (Anthony 1969) in St Albans. There is also a large and diverse sample of Late Iron Age burials at Baldock (Burleigh 1995).

There is growing evidence for the presence of significant numbers of Late Iron Age inhumation burials in the region. Inhumations appear to occur in low frequencies alongside cremations in large cemeteries, particularly King Harry Lane (Stead and Rigby 1989, 80, 204, 207) and Baldock (Burleigh 1995 and pers comm.). Several small inhumation cemeteries have also been discovered in recent years on the river Thames in Essex, at Mucking and Ardale School (Going 1993, 19; Wilkinson 1988, 37–8).

The appearance in the archaeological record of sites and areas within which activities of a ritual and ceremonial nature were carried out is a feature of the later Iron Age, and East Anglia contains some of the most important examples known from Britain. The large enclosed area at Snettisham in Norfolk where a number of gold torcs and other metalwork were deposited seems likely to have been a ritual site (Fitzpatrick 1992; Davies 1996, 78) and other ritual sites in which large quantities of metalwork and coins were deposited are known at Essendon in Herts (Esmonde Cleary 1995; Bryant and Niblett in press), and Harlow in Essex (Bartlett 1987). A Late Iron Age palisaded enclosure is known to pre-date the Roman temple at Ivy Chimneys, Witham, Essex (Sealey 1996, 59), and evidence for ritual activity is increasingly being recognised within settlement sites in the form of deposits of artefacts and the construction of shrines and other structures, frequently associated with burials. Such sites are known at Stansted (Bedwin and Brooks 1989), Verlamion, St Albans (Bryant and Niblett in press), Baldock (Burleigh 1995), Colchester (Crummy 1980), Thetford (Gregory 1991), Barnham (E. Martin pers comm.) and possibly Burgh (Martin 1988). A probable shrine is also known at Little Waltham, Essex, dating to the 3rd century BC (Drury 1980, 52). Sealey has recently drawn attention to finds of human skulls and skull fragments from several settlement and ritual sites in Essex which do not seem to be from burial contexts, including Harlow, Stifford Clays and North Shoebury (Sealey 1996, 50–1). It is suggested that these might represent part of a wider cult of the severed head which was practised in southern England during the Iron Age,

Settlement Evidence

There is evidence of expansion and intensification of settlement in most parts of the region including the boulder clays of Norfolk (Davies 1996, 68) during the later Iron

Age, and settlement is known to varying degrees of intensity over most of the soils and environmental zones in the region. The exceptions are the heavy clay areas (the clay-with-flints in Hertfordshire, the London Clay areas of Hertfordshire and Essex and the boulder clay area of Suffolk) and the lighter soils of Suffolk which do not have easy access to water. However, there is some evidence that settlement of the Suffolk clays does take place towards the end of the Iron Age (E. Martin pers. comm.).

In Norfolk there is some limited evidence of an expansion onto the boulder clay areas of the county (Davies 1996) and in Cambridgeshire recent fieldwork has revealed a substantial rural settlement on the clay at Foxton (Macaulay 1995), indicating a similar expansion there. In the Fens, there is general evidence for an expansion of settlement from sites such as at Haddenham Delphs (Evans and Serjeantson 1988), Cat's Water, Fengate (Pryor 1984), the defended Fen Island enclosure at Wardy Hill, Coveney (Evans 1992a), and Tort Hill, Sawtry (Walsh 1995).

There is evidence for a move towards larger, nucleated settlements in some parts of the region from the 4th to 2nd centuries BC. In Essex, Little Waltham (Drury 1978), Mucking (Going 1993) and the later Iron Age phase at Lofts Farm (Brown 1988a) can probably be classed as hamlets and an extensive industrial site has also recently been discovered on the boulder clay at Wymondham in Norfolk (Davies 1996; Ashwin forthcoming). The settlements at Barley (Cra'ster 1961), Wendens Ambo (Hodder 1982) and West Stow (West 1990) are also substantial and may fit in with this pattern of increasing size.

During the 1st century BC, large settlement complexes or 'oppida' appear in some parts of the region (see Davies 1996, 78 for a recent working definition). They have produced evidence for the presence of a wealthy elite, and for a range of non-agricultural activities including iron and pottery production, exchange of luxury goods and ritual activity. It is however clear that a large proportion of the area within the larger settlement complexes consisted of dispersed occupation and it can therefore be assumed that agriculture was a significant — if not the dominant — activity carried out within them.

A number of large Late Iron Age settlement complexes are known in Hertfordshire and Essex including Verlamion (Bryant and Niblett in press), Baldock (Burleigh 1995), Braughing (Partridge 1981), Cow Roast (Morris and Wainwright 1995), Welwyn (Bryant and Niblett in press), Camulodunum (Crummy 1980) and possibly Heybridge Atkinson 1995a). The extent and nature of the Late Iron Age occupation at Kelvedon (Clarke 1988; Rodwell 1988) may also indicate the presence of a large settlement complex there. The complexes extend over a significant proportion of these counties and appear to be a dominant settlement type during the Late Iron Age (Bryant and Niblett forthcoming).

The density of Late Iron Age settlement complexes is lower in the rest of the region, although several have recently been identified in Norfolk, at Thetford (Gregory 1991), Ashill (Gregory 1977; Davies 1996) and Caistor St Edmund (Davies 1996).

Recent research is also beginning to identify large tracts of relict Late Iron Age landscape in some parts of the region. Extensive field systems which may date to the Late Iron Age are known from the Scole/Dickleburgh area of Norfolk (Williamson 1987) and also at Yaxley in Suffolk (E. Martin pers. comm.).

Settlement Morphology

A higher proportion of settlements appear to have been enclosed in the later Iron Age although unenclosed 'open' sites were still common in Norfolk (Davies 1996, 68) and an open site is known at West Stow, Suffolk (West 1990).
Square and rectangular enclosures seem to have been the most common type and occur in most parts of the region They seem to have had a wide range of functions, from domestic at Gorhambury (Neal 1992 *et al*.), Werrington (Mackreth 1988) and Kelvedon (Rodwell 1988); possibly defensive at Thornham, Warham Burrows and Wighton (Gregory and Gurney 1986) and ritual at Barnham (Pl. III; Martin 1979). The large enclosures at Burgh (Martin 1988) and Fison Way, Thetford (Gregory 1991) were also probably multifunctional although the importance of the ritual role of these sites is increasingly being recognised (Davies 1996, 77). Some circular and oval enclosures are known at Wardy Hill, Coveney (Evans 1992a) and Codicote, Hertfordshire (Burleigh, Went and Matthews 1990).

The domestic architecture of the later Iron Age is comprised primarily of round-houses, typically represented by circular or penannular eaves-drip gullies. These are most common during the 3rd and 2nd centuries BC, and large numbers are known from sites in Essex such as Little Waltham (Drury 1972), Mucking (Going 1993) and Wendens Ambo (Hodder 1982). Recent excavation along the line of the Norwich Southern Bypass has also revealed several sites with round-houses (Ashwin and Bates forthcoming).

An innovation in house design occurs towards the end of the Late Iron Age in Essex and Hertfordshire with the appearance of rectangular buildings on some sites. However, as Sealey has recently pointed out, the structural evidence for these buildings tends to be ephemeral and is only found where deposits have not been significantly damaged (Sealey 1996, 60). Sites where good preservation has allowed evidence of such buildings to be recovered include Skeleton Green within the Braughing complex (Partridge 1981) and Kelvedon (Eddy and Turner 1982, 8–9; Rodwell 1988, 15, 20–1, 132–3).

Industry

Iron working

There is some evidence that large-scale iron smelting was taking place in some parts of the region. A recent survey at Cow Roast and Ashridge has identified an extensive area of iron working on the Chiltern clay plateau adjacent to the Bulbourne valley (Morris and Wainright 1995). The evidence occurs over an area of 10 square kilometres within a complex of settlement enclosures and field systems, and it seems likely that iron working was taking place on a part-time basis. A settlement at Park Farm, Wymondham on the boulder clay of Norfolk has also produced evidence for iron smelting, as well as antler and horn working (Davies 1996, 68).The absence of domestic occupation indicates that the activity was probably undertaken on a part-time or seasonal basis here too (Davies 1996).

Plate III Aerial view of the enclosure at Barnham, Suffolk, July 1979. *Photo: R. D. Carr*

Salt

Evidence for salt production is known from Essex, where large numbers of 'Red Hills' are known along the coast. The Red Hills are made up of the remains of salt-drying containers and other industrial refuse. Over 300 sites are known and although most are of Roman date, it is clear that many began during the Iron Age (Sealey 1996, 61).

The evidence from iron and salt suggests that industrial production was a part-time activity for a significant proportion of the later Iron Age population in some parts of the region. At present the evidence is localised and is largely restricted to the most archaeologically visible processes. However, it seems inherently likely that other industrial activities, common on continental Late Iron Age oppida, such as pottery production, cloth weaving and bone, glass and stone working (Collis 1984), were also taking place particularly within the large settlement complexes.

III. Hillforts

The hillforts of the region appear to fall into two reasonably distinct groups. The first group have a localised distribution along the 'Icknield Belt' of the Chiltern Hills and include Ivinghoe Beacon (Cotton and Frere 1968), Maiden Bower (Matthews 1976, 161), Wilbury Hill (Applebaum 1949) and Ravensburgh Castle (Dyer 1976). They are spaced at regular intervals, and all have produced evidence of relatively dense internal occupation. Ivinghoe and Wilbury probably began in the Late Bronze Age, but the main period of activity seems to be in the Early Iron Age, with some occupation continuing into the Middle Iron Age (Bryant 1995, 24–5; Bryant and Burleigh 1995).

The second group of hillforts occur in Norfolk, Cambridgeshire and Essex, are few in number and widely scattered. They appear to begin later than the Chilterns hillforts and have generally produced little evidence of internal occupation. The hillforts in Norfolk are geographically restricted to the west of the county and where excavation has taken place, have indicated a date range from the 5th to the 1st century BC and little in the way of internal occupation (Davies 1996, 75). There may also be a relationship between the Norfolk hillforts and the large Late Iron Age rectangular enclosures such as Warham Burrows and Thornham, with the latter possibly replacing hillforts (Davies 1996).

In Cambridgeshire, recent research has identified a group of hillforts, including Wandlebury and Arbury Camp, which all have a similar, circular form and a general lack of internal occupation (French and Gdaniec 1996; Evans 1992). The large multivallate circular defended Iron Age enclosure at 'The Auburys' in Hertfordshire can also be added to the list of unoccupied sites (Bryant 1995, 24). However, the circular fort at Borough Fen, Cambridgeshire (Pl. IV) has produced evidence for relatively dense internal occupation (RCHME 1994). The function of the few Essex hillforts is also unclear. They have a dispersed and sparse distribution in the county and in terms of date, probably start in the Early Iron Age, with some continuing to be occupied into the later Iron Age (Sealey 1996).

The general absence of occupation within this group of hillforts and the possible association of the Norfolk hillforts with Late Iron Age enclosures of ritual function, suggests that the hillforts too may have served a primarily ritual function. Certainly, the functional models for hillforts of defence and social storage do not appear to fit the evidence for these sites.

Plate IV The circular fort at Borough Fen, Cambridgeshire. *Photo and copyright Ben Robinson 1994*

IV. Linear Monuments

Iron Age linear monuments are being recognised as a class of monument widespread in the region, which has considerable potential for the further undertsanding of social and political developments during the Iron Age. The range of monuments of this type within the region also makes it an important area for study.

In the Hertfordshire Chilterns short lengths of multiple ditches are situated at regular intervals along the Icknield Belt at right angles to the Icknield Way. Some may originally have been constructed during the Bronze Age but it is clear that most continued to be used and remodelled during the Iron Age (Dyer 1961; Bryant and Burleigh 1995). A large cluster of similar short lengths of multiple ditches to the east of Baldock appears to be associated with the Late Iron Age settlement complex there (Burleigh 1995). The well known linear earthworks at Verlamion and Camulodunum, some of which are massive, also appear to have been associated with the large settlement complex or 'oppida' (Bryant and Niblett forthcoming; Hawkes and Crummy 1995). Davies has recently suggested a Late Iron Age date for several large linear earthworks in Norfolk (Davies 1996, 75–7).

V. Environment and Economy

by Peter Murphy

Sustained woodland clearance, which intensified throughout the Bronze Age, continued through into the Iron Age. At Scole, a renewed phase of major woodland clearance in the late Iron Age or early Roman period, by 2105 ± 35BP (OxA-6119: CAL [2 sigma] 110 BC–70 AD), resulted in removal even of valley floor alder (Wiltshire, in prep.). On the Thames terraces, the lime decline is thought to have been of Iron Age date (Scaife 1988). Micromorphological and pollen analysis of a buried soil beneath a hillfort rampart at Asheldham Camp provided evidence for pre-fort cultivation and downslope soil movement, in an open agricultural landscape with little woodland, apart from hazel scrub (Macphail 1991; Scaife 1991).

In the Breckland, substantial clearance occurred from about 2500BP, and heath vegetation spread from about 2250BP (Bennet 1983). Wet Fen-edge and river terrace sites with palynological and macrofossil evidence for open grassland and fen vegetation were also settled (*e.g.* Haddenham Delphs (Evans and Serjeantson 1988), Cat's Water (Pryor 1984), Borough Fen (French and Pryor 1993: 68–73), Chigborough Farm (Wiltshire and Murphy 1993). At Wardy Hill, Coveney, the defensive ditches of an enclosure have produced thorns and fruitstones of hawthorn and bramble, with pollen of hawthorn-type, bramble-type and undifferentiated Rosaceae, indicating a defensive thorn hedge (Murphy and Wiltshire, in prep.). Surprisingly, the ditches of Stonea Camp produced evidence for the immediate proximity of oak trees (Murphy 1992a; Wiltshire, in prep.). Late Bronze Age to Iron Age wooden structures on the Essex coast have provided data on species composition and management (Wilkinson and Murphy 1995).

Charred Iron Age crop remains have been reported from sites throughout the region (published reports include Green 1985; Jones *et al.* 1982; Murphy 1988a; 1991; 1992b). Predominant crops were emmer, spelt and six-row hulled barley, with lesser amounts of bread-type wheat, rye, wild or cultivated oats, peas and flax/linseed at

some sites. There is evidence for changes in production though time: at Maxey a shift towards spelt production through the Iron Age was inferred; at Wendens Ambo emmer and barley were frequent in Iron Age contexts, rare thereafter, being replaced by spelt. The latest charred deposit dominated by emmer so far known from the region came from a Middle Iron Age feature at Asheldham Camp. Pit storage of cereals was inferred from Fison Way, Thetford and suspected at Rectory Road Orsett, whilst charred deposits from Asheldham Camp were thought to indicate above-ground storage of wheat as spikelets and barley as grain.

Many of the excavated sites in the region were located on neutral to acidic sands and gravels so that bone was preserved differentially, if at all (*e.g.* Fison Way, Thetford, (O'Connor 1992)), or were on too small a scale to yield adequately large assemblages (*e.g.* North Shoebury (Levine 1995)). The material from the Stansted sites has not yet been published. Haddenham Delphs produced a very unusual bone assemblage, with cattle, sheep and pig, but also beaver, swan and pelican, attesting to the exploitation of fen resources, whilst Cat's Water yielded bones of domestic stock, fish and wildfowl. From Edix Hill, Barrington, Davis (1995) reports a Late Iron Age bone assemblage of sheep (50%), cattle (26%) and pig (15%) with other domesticates and wild species. Sheep seem to have been kept primarily for meat. At West Stow, Iron Age contexts produced a bone assemblage dominated by cattle and sheep/goat with few pigs, the low frequencies of the latter probably reflecting the scarcity of pannage in the predominantly heath landscape of the Breckland (Crabtree 1989, figs 3–4 and 107).

In the Fens a widespread transgressive overlap resulted in deposition of the 'Upper Silts' or 'Terrington Beds' with its maximum extent around 1800BP (Waller 1994, 75–9), associated with numerous Iron Age saltern sites. The 'Upper Clay' of the Yare Estuary reflects landwards extension of estuarine conditions from about 2000BP (Coles and Funnell 1981). On the Dengie peninsula, the location of Late Iron Age/Early Roman 'Red Hills' in relation to fossil landscape features has permitted outline reconstruction of contemporary coastlines (Wilkinson and Murphy 1995, 199). Occasional bones of marine fish and small quantities of marine mollusc shell have been reported from coastal sites (Jones 1986; 1995).

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Roman

by Chris Going

I. Introduction

This highly compressed survey summarises recent archaeological progress and focusses attention on topics where it is felt that further advances can most readily be made. It also draws attention to areas where evidence is still weak or non-existent and the need remains for further quite fundamental work.

By the end of the Iron Age and the coming of the Romans, the British begin to enter history. Now, something of the territories of at least four of the principal tribes of the region (the Catuvellauni, the Coritani/ Corieltauvi, the Iceni and the Trinovantes) is known from numismatics and from historical sources but of smaller groupings we know next to nothing. The initial relationships between the indigenous peoples and the newly-arrived Romans ranged from the cordial to the murderous, and their cultural links with and susceptibility to Romanitas — at least as exemplified by material finds — ranges from extensive to slight.

While published works devoted to the archaeology of the region form a substantial bibliography, no attempt has been made to present a comprehensive list. References are solely to works which conveniently summarise data or are relevant to a topic under consideration. However it is worth noting the principal accounts covering parts of the region which have been published in the past quarter-century. These comprise, for Cambridgeshire, Taylor (1975) and Browne (1980); for Essex, Rodwell (1975), Drury and Rodwell (1980), Wickenden (1996), and Going (1996); for Suffolk, Moore *et al*. (1988); and Robinson and Gregory (1987) for Norfolk. Hertfordshire is covered in part in Holgate (ed.) 1995. Two of the principal tribes of the region (the Trinovantes and the Catuvellaunii) have also been the subject of monographs (Dunnett 1975; Branigan 1985), although both of these now require fairly extensive revision. The reader wishing to assemble a more detailed bibliography than is given here should start with these works.

II. Fortifications and Towns

Early military sites

The earliest garrisons no doubt reflect the political allegiances of the local tribes as much as their military strengths. However, locating the initial disposition of the military forces within the region remains a distant goal. Greater understanding of its details and tracking the later deployment of the Roman army would be a signal advance in understanding how the various local tribes were welded into the emerging province of Britannia. Parts of the earliest known Legionary sites such as the fortresses at Colchester and Longthorpe have been explored in some detail (*e.g*. Crummy 1984) but other formal fortifications remain largely unexplored. The two overlapping forts known only from air photographs at Coddenham (Suffolk), and the putative fort at Great Chesterford which divides the Iceni from its southern and south-western neighbours, remain as ill-known as they were in 1971. Temporary military establishments such as marching camps, and scatters of metalwork (often recovered by metal detector users as at Saham Toney, Norfolk) indicative of other military installations, are also little investigated. Work on those in the Icenian Canton may throw light on the garrisoning of the area both before and after the revolt of AD 60. A welcome addition to our knowledge would be the publication of the recent excavations at Pakenham (Suffolk) which revealed the traces of a fortification post-dating the Icenian rebellion.

The major towns

Within the region lie four important urban centres: Colchester, Verulamium (St Albans), Caistor St Edmund and Water Newton. Brief syntheses of the results of work on all of these were published in John Wacher's ground-breaking survey of the towns of Roman Britain (1975); the first national survey undertaken. More recent work up to the early 1990s is conveniently summarised in the second edition (Wacher 1996).

The first three of these towns were, *inter alia*, Civitas capitals and the fourth probably reached similar status. In the first half of the 20th century, Colchester and Verulamium in particular were the subject of pioneering excavations and were the forcing house of many excavation techniques in use until the 1970s.

However, in the past quarter-century Colchester, largely because it underlies its modern successor, has seen most of the Roman urban excavation effort. The results of numerous excavations mounted by the Colchester Archaeological Trust have been impressive and have contributed substantially to knowledge of the Legionary fortress and its metrology, and also to our knowledge of processes of Romanisation and urbanisation within the Province (Crummy 1988; 1992a). They have thrown light on its extra-mural settlement and cemeteries, including, almost uniquely in Britain, a cemetery with an associated church (similar evidence has been found at St Stephens, St Albans). Other excavations have illuminated its vernacular architecture, its industries, its trade and commerce. The results of the Trust's work are published in a continuing research series (Crummy 1996).

Verulamium, Caistor St Edmund and Water Newton, being undeveloped, have seen comparatively little recent excavation and consequently rather less is known of these places. However, the droughts in recent summers have resulted in some impressively detailed crop-mark displays at each site and these should be recorded as a matter of course. Plan information derived from surveys of this kind, coupled with geotechnical survey, should allow concisely and effectively focussed projects to be mounted at these urban sites. Certainly the development and fortunes of Caistor St Edmund should be explored. Little has been done here and its formal street grid and amphitheatre hint at grandiose plans but its defences show that these may never have come to pass.

Figure 6 Location of places mentioned in the text: Roman

The development in the later Roman period of even these large towns is still poorly known. At Verulamium evidence of the continuance of civic amenities into the 5th century is well known but the picture elsewhere is confused. At Colchester there are signs of stagnation and decay (Faulkner 1994). Certainly the later Roman tower granary and corn drier at Culver Street hint at a different kind of town life to that envisaged in the 1st century AD, and there is evidence that the town could not sustain its pottery industry much into the 4th century AD. Projects designed to examine aspects of the larger later Roman towns could be informative.

The 'small towns'

Our knowledge of the origins and development of small towns in the region has recently received a useful impetus. In 1990 a national survey (Burnham and Wacher) reviewed current knowledge of fifty-four of the ninety or so recognised 'small towns' of Roman Britain. The survey included seven towns from our area: Cambridge and Godmanchester in Cambridgeshire; Braintree, Kelvedon and Great Chesterford in Essex, and Braughing in Hertfordshire. The little-understood site of Brampton was the only settlement from either Norfolk or Suffolk then selected for consideration, but more comprehensive coverage is now provided by Gurney (1995) and Plouviez (1995).

This work, in press when the first draft of this document was written, underscores the fact that while useful progress has been made since the last treatment of the topic (Rodwell and Rowley 1975), settlements at communications centres require very much more work before even their morphology, let alone their history can be elucidated with any confidence.

The database for Norfolk in particular remains meagre and there is scope for more work on this topic at sites such as Scole and Brampton, and at Hacheston in Suffolk. It was generally thought by respondents that within the 'small towns' themselves large-scale excavations represented a more cost-effective means of establishing their history and development than numerous small-scale excavations, although specific research-based topics could well be settled by 'tactical' excavation.

There was agreement, too, among the responding bodies that settlements of all kinds need to be examined, not as isolated entities but in relation to their hinterlands and that future projects should consider both town and countryside in conjunction as far as possible. Such projects could most usefully be planned on the back of large-scale non-invasive surveys, for which there was felt to be a need in such regions as parts of Hertfordshire.

III. Roads

The Roman road network of East Anglia has not been greatly extended since the time of the Viatores' useful if controversial work in Hertfordshire a generation ago (for a review of it *en passant* see Simco 1984), and the 4th edition (1993) Ordnance Survey map of Roman Britain shows little addition to the network in the other counties. In some areas knowledge even of trunk routes remains sketchy, and the road network in littoral parts of Norfolk, Suffolk and Essex remains more poorly known than one might wish. Local fieldwork has produced valuable results in some areas such as south-west Suffolk (Charge 1986) and similar work should be encouraged elsewhere. On a larger scale a programme which explores the air photographic evidence would greatly augment our knowledge of the network and would also reveal additional settlement sites, some of substantial importance. It is worth noting that with the exception of Nordelph (Kenny 1933) and perhaps Stebbingford (unpublished), no Roman bridges or culverts have been found in our region. Where roads cross rivers examination of the banks and beds might reveal them.

If the arterial network is ill-known, the smaller secondary or local routes (the *diverticula*) are almost wholly unexplored. Many short lengths have been found however (*e.g.* approaching the Rivenhall Roman villa: Rodwell and Rodwell 1985, pl. xiii a–b). Studies suggesting large scale landscape continuity have tended to imply that numerous trackways and field systems survived from the Roman period until quite recently. Selective trial sections might be carried out to assess these still largely untested hypotheses.

IV. The Countryside

Rural settlement

While there have been been numerous excavations of rural sites within the region, these tend to have been concentrated on high-status settlements — the villas. Work on these was directed principally towards establishing the plan of the domestic ranges of buildings and untangling their structural history rather than exploring the economic bases of their development. Interesting though it is to have plans for comparative purposes, a more informed understanding of the agrarian basis of the countryside is unlikely to come from this approach.

As with the small towns, it is felt that more integrated surveys which set these structures in their agrarian contexts (their economies, field systems and agricultural regimens) are required and that sites which are most likely to provide this, or which are likely to produce not only well-preserved secular structures but also present the chance of recovering organic remains (for example palaeobotanical data, or well-stratified assemblages of animal bone), should merit special attention. Attention ought to be paid, therefore, to establishing the settings of rural sites in as much detail as possible, and perhaps to using geophysical and other prospection techniques in order to obtain data plots of substantial parcels of land. This would allow excavations to be sited in places where the data yield is likely to be highest.

The unexpected potential of structural remains should not be underestimated, however. Rubble spreads found on several rural sites (*e.g.* at Meonstoke, Hants, and in Northamptonshire (Frere 1991, 253)) have recently been identified as the collapsed walls of buildings. These discoveries have made it possible to restore the external appearance of some rural structures with an accuracy which would have seemed impossible only a short time ago. Similar finds have occurred in East Anglia at Great Chesterford, Essex (Brinson 1963, fig. 24), where a whitewashed clay wall topped with a stone architrave was discovered; at Feltwell, Norfolk (Gurney 1986), and more modestly in the shape of a collapsed enclosure wall at Hadstock/Linton in Cambridgeshire (Ette and Hinds 1993, fig. 5). These finds indicate that others await

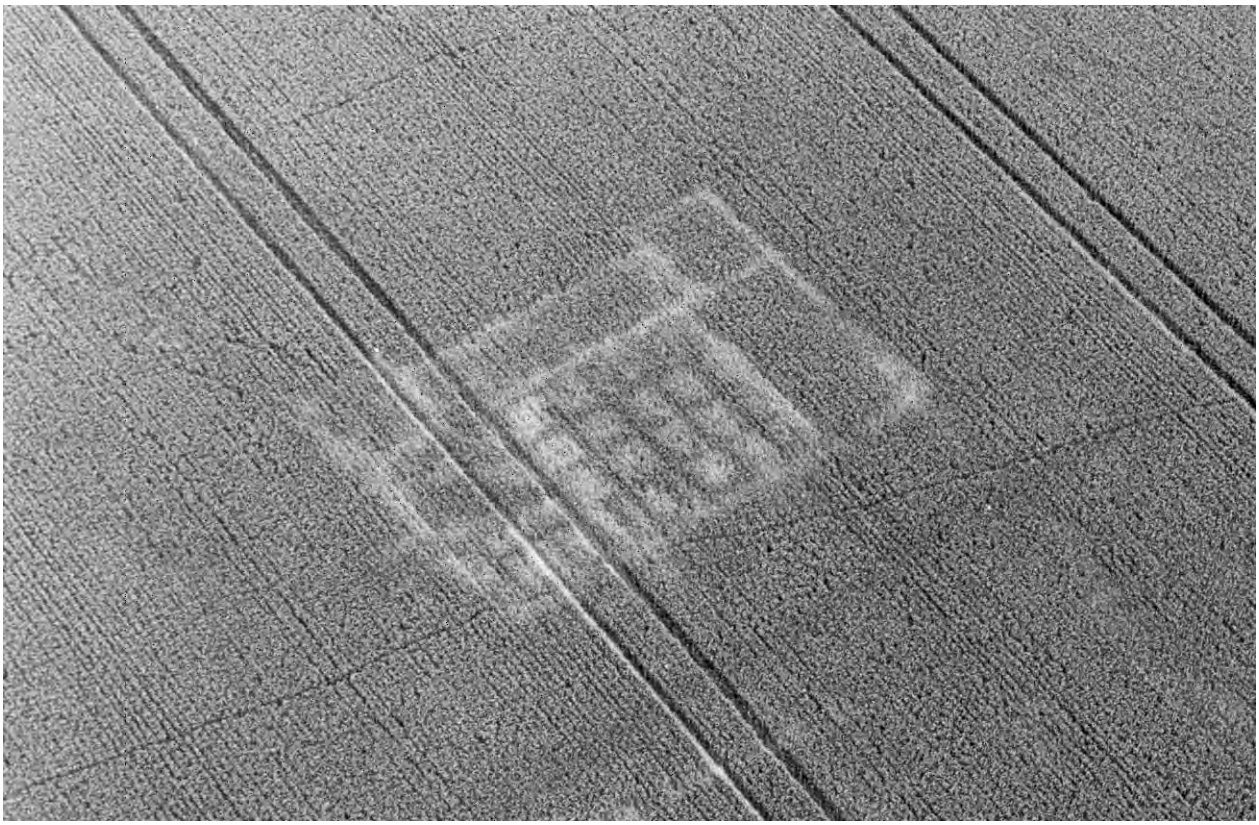

Plate V A recently discovered Roman villa in Norfolk. *Photo: D. A. Edwards,* 26 June 1996 (HKB 8)

discovery in East Anglia and that debris fields close to buildings merit careful examination — a lesson gracefully retailed in Britannia by Ling (1994).

Study of other kinds of rural settlement has not progressed as rapidly as might be desired. Little is known of villages, farmsteads, hamlets and other kinds of rural settlement in which, one imagines, the bulk of the population in the region actually lived. Indeed even a definition of settlement kinds appears to have escaped clear resolution and research into pragmatic systems of classification are clearly needed (*e.g.* Reece 1991). Study of the farm or fundus, and of isolated rural holdings in general, lags severely behind that of the villa. Numerous examples of farms certainly await investigation and it is unfortunate that one of the most extensively excavated examples in the region, that found at Mucking (Essex), remains unpublished.

The landscape

While specialists such as Murphy have published ennvironmental data which allow us to describe the environment of some rural sites in considerable detail, it is a disquieting fact that in an area where Bassett, Rodwell, Drury, and more recently Williamson have carried out landscape analysis on a major scale we cannot really describe the areas between Roman 'sites' in anything but the vaguest terms. Field surveys designed to assess more objectively the appearance of the Roman countryside and the density of settlement within it ought to be planned and implemented. East Anglia should have its equivalent of the Maddle Farm project. Such surveys, coupled with non-invasive geotechnical prospection and phosphate analysis could usefully augment our database and at last shed more light on the appearance of fields and woods of the region's Roman 'countryside'.

Palaeobotanical data has been of inestimable value in elucidating aspects of the Romano-British physical environment both on a macroscopic level, *e.g.* in outlining broad trends in woodland clearance, as well as throwing considerable light on local environments and, where the data is good enough, illuminating agrarian regimes and practices down to individual site level, as Murphy demonstrates. The continued elucidation at site level of *e.g.* field crop types, threshing techniques *etc.*, illuminate, as little else can, the appearance and development of the rural landscape while the identification of occasional imported exotica (such as the identification on sites in the region, of the Norway spruce, or of peacock bones) provide flashes of detail which are the stuff of archaeology. No opportunity should be missed to augment this important data, at whatever level, and suitable environments (such as peat beds and valley floors) should be scrutinised wherever it is feasible in order to build up generalised data on as wide a range of soil and landscape types as possible.

Likewise well-stratified faunal remains which can throw important light on animal husbandry, diet and other aspects of agricultural practice all contribute to a general picture and merit further work. The results greatly amplify the data available to those writing syntheses on the Agrarian economy (*e.g.* Wendens Ambo, Essex) and when artefactual data is woefully inadequate, as in the 5th century, charting the development of an area is often only possible with enironmental information — as the pollen data from the Chelmsford bypass so usefully demonstrates.

Figure 7 The villa at Great Holts, Boreham, Essex, as it may have appeared in the early 4th century AD. Masses of roof tiles were recovered from the bathhouse, virtually none from the area of the main building. The circular structures are haystacks. An extensive system of fields, paddocks and trackways was recovered south of the main building complex.
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Burials

The recent spectacular early Roman burial finds in Essex at Stanway, Colchester (Crummy 1992b, 1993) and Stansted (Duck End) and near St Albans in Hertfordshire indicate that certain social strata in the Trinovantian/ Catuvellaunian region were fairly wealthy in the 1st and 2nd centuries AD (see Whimster 1981 for their Iron Age antecendents). Philpott's recent (1991), synoptic survey sets these burial finds in their context with a useful series of Gazetteers which underscore how exceptional these burials actually are in East Anglia. Indeed his work indicates that both qualitatively and quantitatively East Anglia makes a generally meagre showing where burials are concerned, with Norfolk, for example, producing only some 200 for the entire Roman period. The identification of urban and especially rural Romano-British burials and cemeteries — particularly long-used or later Roman sites — remains therefore a task of some importance and reports of old discoveries might be reassessed. Among cemeteries of interest would be any attached to the Saxon Shore forts, for there are not yet any British equivalents to the cemetery at Oudenburg (Mertens and Van Impe 1964).

Examination of a sample of known cemeteries on a large enough scale to assemble valid sets of biometrical data on rural populations as well as allowing conclusions to be drawn on funerary ritual and behaviour would be useful here. Much also needs to be learned on matters of religious ritual associated with the disposal of the dead and large scale excavation to produce a good database must remain the best next step forwards. Later Roman burials which show evidence of heterodox ritual (such as the multiple interment with weapons found at Great Chesterford in 1854) ought to be explored whenever possible.

Religion

While excavation has shed much light on at least the material remains of Romano-British religious expression there remains much scope for future work. At the core of this will remain explorations of 'formal' or rustic religious sites in urban or 'small town' settings, *e.g.* at Godmanchester (Cambs) and Great Dunmow (Essex: Wickenden 1988). Many rural sites and shrines are brought to light by metal detector users and while excavation will remain perhaps the most informative of all modes of exploration, elucidating the history and nature of these rural sites will depend upon the analysis of surface finds gathered under controlled conditions. The results of work of this kind, notably at Walsingham/Wighton, Norfolk (Gurney 1995) attest to its value, and when coupled with the use of non-invasive geotechnical survey, can be impressively detailed. It is at shrine sites that one of the most intractable problems facing archaeologists in the region — recovering and integrating metal-detecting data into archaeological circles — remains most acute, for it is at similar sites, for the most part, that spectacular finds such as the Barkway and Thetford treasures and, perhaps, the Icklingham bronzes have been made. Recovery under archaeological supervision must remain the goal.

Religious sites which appear to span both the later pre-Roman Iron Age and the Roman period proper (such as the Harlow temple, Essex) may offer useful data on continuity of belief into the Roman era and the impact of a structured architectural enviroment on indigenous rituals. Deity couplings may throw additional light on syncretic beliefs.

Artefact deposits on these sites may throw useful light on both religious and other topics. Temples such as Harlow and Great Chesterford (Essex) and Haddenham (Cambs) have produced important bone assemblages and the slaughtered animals may provide useful insights into Romano-British animal husbandry. In this context the remarkable votive deposits discovered at the temple site at Castle Hill, Cambridge (Alexander unpub) ought to be examined as a priority. More integrated study of all find classes from temples or suspected religious sites is desirable. In the case of large numbers of objects the ritual significance may be obvious (skewed ceramic assemblages indicating feasting; large numbers of stone tools which are clearly 'ceraunia', as at Ivy Chimneys, Witham), but the 'meaning' of single finds — such as sink stones — is easily overlooked and should be sought out.

If Pagan religious practices remain largely obscure we also know remarkably little about the spread of Christianity within the region. The identification and excavation of the Christian church and cemetery at Butt Road, Colchester is a significant contribution to our knowledge (Crummy and Crossan 1993) but it remains virtually without local parallel. Sites such as Ivy Chimneys, Witham (Essex), which became a Christian centre, and the site at Icklingham (Suffolk) remain for the moment rare but further research is likely to produce other sites. Metal detecting has played as significant a part in the recovery of Christian artefacts as Pagan ones (most spectacularly at Water Newton), and steps need to be taken wherever possible to encourage the reporting of finds.

Industrial sites and potteries

Within the larger 'small towns' as well as in rural areas extractive and production industries undoubtedly operated on a substantial scale. Of these the most obvious, archaeologically speaking, are pottery production sites (for which see Swan 1984), tileries (McWhirr 1979) and Red Hills (Fawn *et al*. 1990). Ceramics production has been the subject of recent survey by Fulford and Huddleston (1991), in which the importance of certain local industries was pointed out. There is general consensus that the little-known potteries of Suffolk and Norfolk (and in particular those close to Brampton, at Wattisfield, and in the Nar valley) require attention in order to assist in dating sites within those areas while in Cambridgeshire the Horningsea complex, which supplied much of the Fen region, and the potteries in the vicinity of Water Newton, need further work. In Hertfordshire the Hadham complex and its relationship with the important pre-Roman *entrepot* and Roman 'small town' at Braughing require more study, as do the production sites in the vicinity of St Albans. Essex, while well served for publications, still merits work on some areas, notably on production sites in the south of the county (*cf.* Martin and Wallace 1996).

Ample scope exists for examining other industries, for example, salt production. Aerial reonnaissance has recently revealed substantial further 'red hill' sites in Essex and more survey work is clearly needed. Refining the chronology of these sites would be valuable, for they appear not to have been in continuous production throughout the Roman era. However their function in the later Roman period is enigmatic: evidence suggests that some were used in connection with animal husbandry

(Sealey 1995). Perhaps phosphate surveys might assist with interpretation. Other coastal industries have hardly been touched upon: while no hard evidence on the site has yet been published one such industry which ought to be thoroughly assessed is the putative salazon (fish sauce) production site on Canvey island, which if correctly identified will be the first known from Britain. Research on bivalve farming, too, might be of interest.

If our knowledge of economic activities associated with the region's coasts is nugatory other kinds of production site inland are still poorly known or understood. Chief among these is metalworking of all kinds, whether of copper alloy or, economically most important of all, of iron. Extraction sites must have existed wherever viable pan deposits were found, yet very little is known of these, or indeed of any other type of metalworking site. Better understanding of Roman iron working in the region must be a major research objective.

Other industries require attention almost as urgently. Among these is quern manufacture, a minor industry but one which must have left significant traces. Production sites are little known and outcrops of Hertfordshire puddingstone would certainly repay study. Elsewhere, for example in Chelmsford, horn cores indicative of leather working have been found and at Great Chesterford, a possible bone pin manufacturer's workshop has been excavated (unpub). Until we are capable of identifying more fugitive traces of other trades the range of activities directly attested by archaeological finds will remain pitifully small.

V. The later Roman Period

The Saxon Shore fort system

The region includes perhaps the most important stretch of the 'Saxon shore' of all, that vitally exposed length of it facing the 'German Ocean' from the mouth of the Wash to the Thames estuary. However there has been little recent excavation within the surviving forts (Walton has gone) at Brancaster, Burgh Castle, and Bradwell, although there has been some work in the fort environs of Brancaster and Bradwell (for a recent general survey of the relevant forts see Stephen Johnson's Gazetteer (1989) compiled for the Limes congress). The recent acquisition by the Norfolk Archaeological Trust of Burgh Castle may pave the way for useful work.

The dating of the earlier fortifications on the coast (for example the enclosure known from Derek Edwards' air photography at Brancaster and Caisteron Sea), and the way the mature defensive system operated certainly requires more exploration, as do the links between the forts and towns in the hinterland, a topic investigated some time ago by Barford in relation to Bradwell (unpub). Few of these East Anglian 'small towns' appear to have been equipped with defences in the later Roman period, in contrast to the towns west of the Fens, *i.e.* Ancaster, Water Newton, Great Casterton, Godmanchester (Durovigutum), Cambridge and Great Chesterford, which all appear to have been provided with walled defences in the 3rd or 4th centuries AD. When it is recalled that during the later 2nd century earthworks were erected round even quite small towns in Roman Essex the lack of 3rd–4th century AD defences at some of the more important centres in the East Anglian road net certainly merits more concerted study. In this context Great Chesterford needs further consideration as a putative nodal point of some importance. With its two walled circuits it is a most enigmatic site (Going in prep.).

The Roman-Saxon Transition

At the end of the 4th and the beginning of the 5th centuries AD, production of Romano-British material diminished very greatly. The money economy collapsed, and numerous other artefact types (such as glass) ceased to be traded to the British Isles. The Romano-British potteries went out of production and aceramic settlement becomes common. Without these vital chronological benchmarks, identifying continuing settlement becomes extremely difficult and dating it next to impossible.

The region as a whole differs greatly in the evidence which it offers of the immediately post-Roman centuries. In counties such as Norfolk, Suffolk, Cambridgeshire and parts of Essex, finds of 'Germanic' material are comparatively plentiful, and in consequence it is in these counties that most settlement and cemetery 'sites' have been discovered. Other areas such as west Essex and Hertfordshire, which produce very little Pagan 'Saxon' material (Sir Mortimer Wheeler's 'sub Roman triangle'), are characterised by an extreme paucity of material of any kind until 'chaff' tempered pottery makes its appearance across the region after the later 6th century. This lack of evidence was once considered to indicate abandonment, but in the light of more sensitive excavation and the recovery of palaeobotanical data which confirms continued anthropogenic disturbance, this lack is now being characterised as a kind of negative type fossil indicative of British survival (Rutherford Davies 1984).

While sites with 'long' stratigraphies spanning the 4th and 5th centuries are not unknown in this latter region (*e.g.* at Latimer (northern Bucks), and advocated at Rivenhall, Essex), we need to become more adept at recognising them here, and also in areas where Germanic data is more plentiful if we are to advance our understanding of the settlement history of the region. One of the ways 'long' stratigraphies might be identifiable, paradoxically, is from the treatment of certain classes of Roman artefacts. On some sites (*e.g.* West Stow, Mucking, Hinxton, and probably Heybridge, Essex) these seem to have been deliberately collected and curated. This suggests that they post-date the disappearance of ceramics use and must be later than *c*. AD 445/50. Quantification of Roman material in what are sometimes dismissed as very late Roman levels might restore post-Roman strata to some sort of archaeological visibility.

In sum the 'dark ages' remain a difficult and challenging period. It is clear that British survival was more widespread than has been assumed but lack of material finds in comparison with the later Roman period has rendered them, and no doubt many immigrant communities also, difficult to see. Many different kinds of evidence must be studied in an integrated fashion if the period is to be illumated effectively. One task which might be undertaken is on the complex allegiances of the region, work pioneered, sometimes waywardly, by the late John Morris. In this context an up-to-date synthesis of the Icknield way and the linear defensive systems which cross it is badly required.

VI. Environment and Economy

by Peter Murphy

Palynological data indicate that the process of progressive permanent woodland clearance initiated in the Bronze Age continued into the Roman period. At the Mar Dyke, sediments considered to be of Roman date produced pollen assemblages with as little as 10% tree pollen, and up to 5% cereal-type pollen (Scaife 1988, 109). A Late Iron Age/Roman well on the terrace gravels of the Blackwater at Slough House Farm gave comparable results, with tree and shrub pollen averaging only 12.5% (apart from willow, which was probably growing very close to the feature) and cereal-type consistently represented (Wiltshire and Murphy 1993).

Romano-British landscapes in many areas of Eastern England seem, above all, to have been agriculturally productive. Results from studies of charred crop remains indicate an emphasis on the production of spelt wheat. Spelt-dominated assemblages, remarkably uniform in composition, have come from sites in the fens (*e.g.* Stonea: Van der Veen 1991), Fen-edge (*e.g.* Maxey: Green 1985), the Boulder Clay Plateau (*e.g.* Duck End Farm, Stansted: Murphy 1990b), areas of light sand soils (*e.g.* Pakenham: Murphy and Wiltshire 1989) and coastal sites (*e.g.* Canvey Island: Wilkinson and Murphy 1995, 193). Other field crops from rural sites comprise six-row hulled barley and emmer, with lesser amounts of horse-bean, pea, oats, rye, and flax/linseed. Palynological results from a wood-lined pit at Scole, dated on ceramic evidence to the Roman period, have indicated the possibility of local viticulture and hemp cultivation (Wiltshire, in prep). Intensive cultivation resulted, in some areas, in increased soil erosion and alluviation: alluvium covering terrace gravels, and infilling palaeochannels, in the valleys of the Welland and Nene has been shown to be largely of Roman and post-Roman date (French and Pryor 1993; French 1983; 1988).

Roman wooden structures, including well-linings, are commonly of massive oak timbers (*e.g.* at Scole: Rogerson 1977, 111–117). High quality timber use is evinced by the turned furniture legs of walnut from Scole (Liversidge 1977). Roundwood and slatted well-linings (*e.g.* the lining of willow, hazel, oak and ash in a well at the Scole/Stuston Bypass: Murphy, in prep.) and hurdles, perhaps associated with management of sheep flocks on the Essex marshes (Wilkinson and Murphy 1995, 150 and forthcoming) have been recorded.

Roman faunal remains from Essex have been reviewed by Luff (1993), though much material elsewhere remains unpublished. The main trend is increased cattle exploitation and a decreasing importance of sheep, through the Roman period; a trend perhaps in part related to the increased intensity of arable farming, with its demand for traction power and manure. At Colchester, Luff concludes that sheep bones were not the by-products of a primarily wool-producing system, but were bred specifically to supply the city with meat. Some early military sites have produced relatively high levels of pig bones, a feature paralleled at contemporary Italian military sites (U. Albarella, pers. comm.). Other domestic stock included horses, dogs, cats and fowl. Elsewhere in the region published bone reports are few, though a Roman farmstead site at Haddon Lodge Farm on the line of the A605 has produced a good faunal assemblage (French 1994).

Plate VI Olive stones (top) and cone bract and nut of the Mediterranean stone-pine (below) from a Late Roman well at Great Holts Farm, Boreham, Essex
Scale 2:1

Although no rural estate has been fully excavated, it is possible to assemble a composite picture, largely from recent unpublished data. A burnt granary from Great Holts Farm, Boreham included spelt, barley and pulses in its post-hole fills (Murphy, in prep). Evidence for malting and malt-drying facilities, using spelt grain, has come from Stebbing Green, Boxfield Farm, (Stevenage), Solesbridge, (Chorleywood) and Scole (Murphy 1989a; 1990c, Fryer and Murphy in prep). The latter site also produced good evidence for a ploughed field with a hedge of willow/sallow, blackthorn/hawthorn, elder and bramble (Fryer and Murphy, in prep.). The basal fills of wells were sometimes natural accumulations (Greig 1988) but dumped crop processing and food wastes, such as spelt chaff and 'luxury' foods including walnut, stone-pine, olive and chestnut have been recovered, as at Great Holts (Pl. VI) and Scole (Jones 1977). The well at Great Holts also produced bones of red deer, hare and sparrowhawk, with a large number of thrush bones (the typical prey of the latter), hinting at an affluent life-style involving recreational hunting and hawking (Albarella, in prep). There is also evidence for rural gardens: an ornamental pond and other features associated with the villa estate at Rectory Farm, Godmanchester produced macrofossils of spruce, (hitherto thought to be a post-medieval introduction), box, yew, grape, beet, marigold, fig, fennel and opium poppy (Murphy, in prep.).

The Boudiccan destruction deposits at Colchester have produced extensive charred granary deposits,

comprising batches of spelt, spelt malt, emmer and bread wheat, stored as grain with very little chaff, few weed seeds and virtually no evidence for spoilage by damp or insects. 'Exotic' crops from these deposits include coriander, dates, figs and stone-pine cones (Murphy 1977; 1984; 1992c). Other specifically Mediterranean tastes are indicated by the unusual abundance of carpet-shells ('palourdes') and bones of mullets at Culver Street (Murphy 1992; Locker 1992). The most commonly-occurring fish species were eel, herring, plaice and flounder. Some oyster shell assemblages from North Shoebury are thought to have come from managed beds (Murphy 1995, 142–5). There is evidence for Roman cultivation *within* the city of Colchester, at Culver Street (Murphy 1992, 284–5) and just outside the walls, at Balkerne Lane (Crummy 1984, 138–141).

Military sites have been studied. Some dietary and parasitological data have come from first century latrine pits at Colchester (Murphy 1992), but of greater importance is the stratigraphic and air-photographic information permitting palaeogeographic reconstructions at Brancaster, Burgh Castle, Caister-on-Sea and Bradwell-on-Sea (Funnell and Pearson 1989; Godwin 1993; Murphy 1993; Murphy and Funnell 1985; Wilkinson and Murphy 1995, 195–6). Some, at least, of the Cambridgeshire Dykes are likely to be of late or immediately post-Roman date. Analysis of molluscs from buried soils and ditch fills associated with Devil's and Fleam Dyke, Brent and Bran Ditch (and also Worstead Street Roman road) points to open grassland habitats on chalk soils at the locations studied (Murphy 1993b). Micromorphological and other soil studies showed that truncated rendzinas and brownearths were represented (French, in prep.)

By about 1750BP, MHWST was at +0.4m OD at Tilbury (Devoy 1980, 145) and the Essex estuaries would have taken up roughly their present form: the palaeogeography of the Dengie peninsula is summarised by Wilkinson and Murphy (1995, 199). In the fens, extensive deposition of marine sediments (the Upper Silts or Terrington Beds) continued in some areas, though in parts of Norfolk there was a withdrawal of marine influence, and Roman settlement on these deposits. However, sediments, shown by foraminiferal analysis to be marine flood silts, between layers of metalling of the Fen Causeway at Nordelph show that this was still a hazardous environment (Godwin, in prep.). Freshwater flood events have been suggested during the 3rd century AD (Waller 1994, 78–9).

VII. Other Topics

Many could be mentioned (*cf* SPRS 1985) but doing so would unduly prolong the length of this document. The use of coinage, for example, is a matter of considerable complexity and interest. Surveys geared to providing fuller coin lists, similar to that prepared for Norfolk (Davies and Gregory 1991) might throw more light on the development of the monetised sector of the regions' economy. A survey of the coasts, devoted in particular to establishing the sites of harbour works might be extremely revealing, while work in the vicinity of fortifications like Burgh castle could provide evidence on later Roman ships and shipping. A database could be set up on possible wreck sites. There is at least one mortarium-carrying wreck in the Thames and other vessels must remain to be found.

Finally, some papers which challenged more conventional ideas about Roman Britain and the region in general, *e.g.* Reece (1980), Bartholomew (1984), Thompson (1991), have not all had an easy passage. It is now clear that data which might confirm or refute them is becoming available in greater quantities as the local database expands. Some of the questions raised by them should be kept in mind when new projects are framed.

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Figure 8 Location of places mentioned in the text: Anglo-Saxon and medieval (rural)

Anglo-Saxon and Medieval (Rural)

by Keith Wade

I. Introduction

There was every reason to believe in the mid 1970s that the next twenty years would see major advances in our knowledge of the post Roman period. The region had led the way with large scale excavations at West Stow, Suffolk, North Elmham, Norfolk, Mucking and Wicken Bonhunt in Essex and pioneering fieldwork had been completed by Peter Wade-Martins in Norfolk. Archaeological Units had been established in all of the counties in the region and archaeological theory was developing more rigorously scientific approaches to data collection and interpretation (Wade 1974). These expectations have largely been fulfilled for the Anglo-Saxon period, especially in Norfolk and Suffolk, but rural medieval archaeology has been neglected in comparison and there has been a decline since 1990 in both rural and urban excavations as a result of the recession and new planning guidance which promotes preservation *in situ* rather than excavation.

In Norfolk, fieldwalking surveys were completed at Fransham, Barton Bendish, Illington (Davison and Green 1993) and three parishes in the south-east of the county (Davison 1990). In Essex, fieldwalking was largely limited to the north-west of the county (Williamson 1986) and the parish of Stansted (Brooks 1993). In addition, the Fenland Survey has covered areas of North Cambridgeshire, West Norfolk and a small part of West Suffolk (Hall 1987 and 1992; Silvester 1988 and 1991). The other major survey was that of South-east Suffolk (Newman 1992).

Probably, the most significant additions to our knowledge of population distributions came from the thousands of metal detected objects recorded throughout the region, especially in Norfolk, Suffolk and Cambridgeshire. Excavation during the last twenty years has rarely been problem-orientated apart from the occasional research project such as Sutton Hoo, and the occasional opportunity to conduct research through rescue such as the Cambridgeshire Dykes Project. This is not to deny that the vast amount of rescue work has provided further valuable insights about the quantity and quality of the archaeological resource.

The range of monument types expands with time from the apparently simple settlement, cemetery and linear earthwork division of the Early Anglo-Saxon period to the plethora of monuments in the medieval period. While there is no doubt that society becomes more complex, the apparent increase in monument types is more to do with their visibility. In reality, there were, for example, religious and aristocratic sites in both the Pagan and early Christian periods which cannot yet be defined. The visibility of the later monuments, such as castles and churches, has attracted researchers to them and produced an inequality of evidence for the post Roman period as a whole.

For the Anglo-Saxon period there has been a plethora of syntheses of current knowledge and much questioning of earlier interpretation (*e.g.* Hodges 1989, Parker-Pearson *et al*. 1993), but little of this has yet been translated into new research questions.

II. Anglo-Saxon

Political Framework

The evidence for the political framework in the immediate post Roman period has recently been reviewed for East Anglia (Scull 1992, 3–23). The traditional model of an *adventus Saxonum*, *i.e.* mass migration, in the mid 5th century has now been abandoned in favour of settlement over a longer period, starting in the second quarter of the 5th century. Similarly, the model of early 5th-century federate settlement followed by revolt (Myres 1969) is now out of favour, and the extent to which culture change at this time was accompanied by population change has been questioned (Hodges 1989, 29–36).

Little is known about the political structures of the 5th century in the region. This apparent political vacuum between the withdrawal of Roman power and the establishment of Anglo-Saxon polities in the 6th century is a major research question for the future. The recent dating of the construction of the Cambridgeshire Dykes to the early 5th century implies the existence of a major political power located in East Anglia and is the sole evidence for it (Malim *et al.* forthcoming).

The discernible groupings of people in the region in the 6th century were the East Angles (Norfolk and Suffolk), the Middle Angles (Cambridgeshire), the East Saxons (Essex), and the Middle Saxons (Hertfordshire). By 600 the Middle Saxons (*i.e.* Hertfordshire) were part of the East Saxon Kingdom with London as their capital. The evidence suggests that the Kingdoms, or *provincia* were divided into sub units, or *regiones*, for administration by *principes* or sub-reguli. Ely, for example, was a *regio* according to Bede. Whether these subdivisions represent earlier political entities, eventually subsumed into Kingdoms, is conjecture but their definition and study is crucial to understanding the political development of the period.

From 650 the Middle Angles had been subsumed into Mercia and by 750 so had the East Angles and East Saxons, but there was, no doubt, a continuation of some form of independent rule. This appears to be supported by the distribution of Ipswich Ware which changes markedly outside the East Anglian border.

Demography

There has been little change in our knowledge of population distribution over the last twenty years despite some systematic fieldwalking and the now ubiquitous finds of metal detectorists. This has confirmed, however, that in all parts of the region, Early Anglo-Saxon settlement appears to be largely restricted to the lighter soils and river valleys, indicating a dramatic fall in population size in comparison with the Roman period (Penn 1993 and West 1988), although a substantial fall in population appears to have taken place in the 4th century.

The large apparently unpopulated areas, especially in west Essex and Hertfordshire, have traditionally been explained as forest, but this may be too simplistic. There is an ongoing debate on the extent of post Roman woodland regeneration, but environmental evidence suggests that, at least in some areas, there was no large-scale woodland regeneration (see IV below).

Techniques of landscape stratigraphy and topographic analysis, applied to various parts of the region, appear to indicate that the pattern of fields and trackways could have been 'established in the later Iron Age and Roman periods, and has survived because of subsequent continuous agricultural usage of the areas concerned' (Drury and Rodwell 1980; Williamson 1987). Some caution is needed, however, in relating the continued use of fields with population size as not enough is known about the agricultural regimes practised. Early Anglo-Saxon agricultural exploitation may well have been far less intensive than in the Roman period, *i.e.* pasture rather than arable (see IV below).

The ongoing 'extent of woodland' debate is linked to the 'surviving Romano-British population' debate. The lack of Early Anglo-Saxon sites in west Essex, the Hunts part of Cambridgeshire, and Hertfordshire, has been explained as indicating a surviving Romano-British political entity with a small (initially) Germanic settlement 'living in controlled circumstances on "Roman" settlements' (Drury and Rodwell 1980), with surviving Romano-British populations that are invisible archaeologically. Others have explained the gaps as more to do with the difficulties of finding Early Anglo-Saxon sites.

Williamson's work in north-west Essex was not initially successful in locating Early or Middle Saxon settlement, but selective re-examination of some of the area, using more intensive fieldwalking techniques, did produce small handmade sherds of this date in about half of the lighter soil areas of valley sides. His conclusions, however, were still that 'there are signs that some land also went out of cultivation even on the lighter soils' and 'there was clearly a considerable contraction of land under cultivation in the post Roman period, with woodland growing up over abandoned farmland on the interfluve soils' but that even 'on the interfluves' there is 'some evidence of Saxon occupation, although whether such settlements were involved in the arable exploitation of these difficult soils is perhaps more doubtful' (Williamson 1986, 127).

No problems were encountered in locating Early Anglo-Saxon sites from pottery scatters in the Norfolk or Suffolk surveys (Davison 1990 and Newman 1992). In addition some of the Suffolk sites were metal detected and the objects found allowed a distinction to be made between settlement and cemetery. There is often a problem, however, throughout the region, of distinguishing Iron Age from Early Anglo-Saxon sand-tempered pottery, especially when dealing with abraded surface finds.

There is ubiquitous evidence from Norfolk and Suffolk for settlement shift and population expansion during the Middle Saxon period. The Norfolk SMR now contains nearly 500 Middle Saxon sites, known from surface scatters of finds and virtually every parish may contain a settlement, apart from the most inhospitable (Rogerson 1993; Wade-Martins 1980). This includes the important new evidence of the deliberate resettlement of the Norfolk Fen-edge (Silvester 1988, 156–60). Suffolk similarly is producing a considerable number of sites of this period when systematic survey is undertaken (Wade 1988).

In contrast, evidence of Middle Saxon settlements in Essex, Hertfordshire and Cambridgeshire is poor. Sites identified by the presence of Ipswich Ware are rare. In Essex only nine sites are known from a handful of sherds and these are mainly monastic and coastal and Cambridgeshire has only six. Undoubtedly grass tempered pottery was the norm in these areas until the 9th century. This causes two problems — firstly, it does not on its own allow a distinction between Early and Middle Saxon sites and, secondly, it is friable and less likely to survive on the surface of arable fields. Clearly, the current archaeological evidence underestimates the distribution and density of settlement in Essex, Herts and Cambs which are known to have been inhabited by various tribal groups listed in the 7th-century Tribal Hidage — the Waeclingas, Hicce, Cilternsaetna, Gifla, Willa, Gyrwa and Herefinna/Hyrstingas.

What is clear from the surface scatters of both Middle and Late Saxon settlements in Norfolk and Suffolk is that they vary considerably in size. They also vary considerably in the character of surface finds, from the coin and metalwork 'productive' sites such as Burnham (Norfolk) or Barham (Suffolk) to sites poor in such finds. There is also considerable variation in the quantity of Ipswich Ware found in surface scatters, with more prolific sites in west Norfolk and the Fens. These apparent indications of settlement ranking/hierarchy have yet to be properly quantified and evaluated by sample excavation.

During the Late Saxon period, both population size and density again increases. Norfolk, for example, has pottery of this date recorded from over 1,400 sites. Throughout the region, the *Domesday Book* is probably a better indication of population distribution than the archaeological evidence.

There has been little progress on the detailed examination of skeletal remains for evidence of sex ratios, average ages of death, *etc*., for the Early Anglo-Saxon population as bone survival is rare, apart from on chalk (the Barrington cemetery, Cambridgeshire, is an important example of bone preservation). Work by McKinley (1994) has shown, however, that important information can be extracted from cremated bone. Middle and Late Saxon burials do, by contrast, survive well and important groups have been studied from Burgh Castle, Caister-on-Sea and North Elmham (Norfolk), Brandon and Butley (Suffolk) and Nazeingbury and Wicken Bonhunt (Essex). With the exception of Bonhunt, all the groups could have monastic associations.

Social Organisation

No Early Anglo-Saxon settlements have been excavated on a large scale during the last twenty years and West Stow (West 1985) and Mucking (Hamerow 1993) remain the only examples for the region. Partial settlement excavations have been undertaken at Orsett, North Stifford, Heybridge, Barling Magna, Sutton, Colchester, Great Wakering and Tolleshunt D'Arcy (Essex); Spong Hill, Thetford, Billingford and Brettenham (Norfolk); Baldock (Hertfordshire); Grantchester, Harston, Hinxton, Linton, Pampisford, Waterbeach and Stonea (Cambridgeshire) and Hacheston and Needham Market (Suffolk). These excavations have mostly produced only

sunken-featured buildings and rarely defined the limits of settlement, with consequently no evidence of the size of settlement units represented, or the ranking evident in the cemeteries.

Chris Taylor in synthesising the evidence for Early Anglo-Saxon rural settlement in England has made the point, and it is an important one, that it is misleading to talk of 'villages' at this period especially when the origin of villages is important to establish.

Many of the known occupation sites consist of a few sunken-featured buildings, probably representing isolated farmsteads or small hamlets 'with no clear form or shape which can be related to anything which follows them' (Taylor 1983, 116). '...Most were short-lived, few being occupied for more than a century at the most before being abandoned and those inhabitants moving on elsewhere'. Parishes systematically fieldwalked have often revealed a series of small occupation sites of this period. Even the larger sites excavated at Mucking and West Stow, 'do not square with the traditional ideas of a Saxon village...'. 'By later medieval standards most might more strictly be called hamlets', '... the majority have no definable plan as is characteristic of later villages. There is rarely any clear street system, and certainly no trace of neat greens, back lanes, or continuous building lines. All that usually exists is a cluster of ill-defined houses' (Taylor 1983, 116–117).

In contrast to settlement studies, important Early Anglo-Saxon cemetery excavations have been completed at Springfield Lyons (Essex); Spong Hill, Bergh Apton, Morning Thorpe and Harford Farm, Caistor St Edmund (Norfolk); Barrington, Gunthorpe, Haddenham, Oakington and Swaffham Prior (Cambridgeshire) and Snape, Sutton Hoo and Boss Hall, Ipswich (Suffolk).

At Barrington, an important inhumation cemetery with human bone surviving has been excavated on a large scale. The 6th/early 7th-century graves included bed burials. At Swaffham Prior Early Anglo-Saxon burials were found associated with a Roman shrine.

The Springfield Lyons excavation (1987–90) revealed a mixed cremation and inhumation cemetery, of 5th/7th-century date, with over 200 burials (Buckley and Hedges 1987). Little skeletal evidence survived but a third of the burials contained grave goods including a wide range of brooches, beads, weapons and dress fittings.

The Spong Hill cemetery, Norfolk, excavated between 1972 and 1981, produced nearly 2,500 cremations and nearly 60 inhumation burials, dating from the later 5th and 6th centuries. Catalogues of all the graves and their finds have now been published, together with a complete report on the cremated animal bones and two volumes on the non-cemetery occupation for the site from the Neolithic to the medieval period. The cemetery may have served a large territory in central Norfolk, rather than a single settlement. Both artefacts and burial practices suggest strong contacts with Schleswig Holstein which could be interpreted as supporting the traditional identification of Germanic immigrants to Norfolk as Angles. There are however also many similarities with the recently excavated site at Issendorf, south of Hamburg, which is just within Lower Saxony (Hills 1993).

The new campaign at Sutton Hoo, Suffolk (1983–1992) excavated the northern half of the cemetery, involving eight barrows, the area between them and an area of flat cemetery due east, interpreted as ritual and involving human sacrifice. All except one barrow (not showing as an earthwork) had been robbed. The latter contained a young person of high status, with a sword and bronze buckle inlaid with garnets, and alongside a horse burial. The excavation has confirmed that the cemetery is indeed exclusively high status (no folk cemetery) and had a short life from the late 6th to 8th century (Carver 1992).

The excavations at Snape, Suffolk (1985–1990) were smaller scale but also clarified the nature of this cemetery which had produced a ship burial in 1862 of mid 6th-century date. The excavation revealed a mixed cremation and inhumation cemetery spanning the entire period (5th–7th century). A wide range of inhumation burial practice was present, including small barrows, chamber burials and a small boat burial (Filmer-Sankey 1992; Filmer-Sankey and Pestell forthcoming)

Important new information has also emerged on the dating of the Cambridgeshire Dykes with sample excavation of the Bran Ditch, Brent Ditch, Fleam Dyke, and Devil's Dyke. Radiocarbon dates from the sequence of the Fleam Dyke indicate a construction phase in the early 5th century, with remodelling in the 6th century and early 7th century (Malim *et al.* forthcoming). In contrast the Launditch (Norfolk) has been shown to be Iron Age.

In contrast to the Early Anglo-Saxon period, evidence during the Middle Saxon period is biased towards settlements. Wicken Bonhunt, Essex, remains the most extensively excavated settlement of this date in the region and publication of the results is long overdue. Sites have been excavated at Nazeingbury, Barking Abbey and Waltham Abbey (Essex); Middle Harling, Billingford, Terrington St Clement, West Walton and Walpole St Andrew (Norfolk); Butley, Ipswich (Whitehouse) and Brandon (Suffolk); Pirton, Letchworth and Hertford (Hertfordshire) and Hinxton Hall (Cambridgeshire).

At Barking, no evidence of the Saxon church has been discovered, but excavations in and around the precinct have revealed important evidence concerning the nature of this Middle to Late Saxon monastery. Excavation in 1985–6 revealed two buildings, wells and the leat of a mill (MacGowan 1987). This and other excavations suggest a wealthy estate centre, scattered over a substantial area, with evidence of iron, bronze and textile production, as well as the styli and window glass normally associated with monastic activity. Imports of pottery from Ipswich, Northern France, Belgium and the Rhineland, as well as Eifel lava quernstones, may imply a port of trade function via the River Roding to the Thames.

Excavations at Waltham Abbey have also produced important evidence of this period, including a possible timber church with a burial radiocarbon dated to 560 ± 50, replaced in the 8th century by a stone structure associated with a settlement. Finds included Ipswich Ware and continental pottery (Huggins and Bascombe 1992; Huggins 1970, 1972, 1973, 1976, 1988a, 1988b; Musty 1978). Excavations at Nazeingbury in 1975–6 revealed a Middle Saxon cemetery with nearly 200 burials associated with two timber buildings interpreted by the excavator as successive churches (Huggins 1978). The predominance of females and pathology of the skeletons suggests a nunnery or hospice run by nuns.

At Billingford, an area of iron smelting of Middle Saxon date, utilising a process rare in East Anglia, was found associated with post-hole structures of post Roman date.

At Middle Harling the site of a Beonna coin hoard was excavated but no contemporary structures were located (Rogerson 1995). The three Fenland sites (Terrington St Clement, West Walton and Walpole St Andrew) were only sampled and no structures were discovered. Whether this is a reflection of the 5% sample excavated or the seasonal nature of occupation is uncertain.

The Burrow Hill, Butley, excavations produced post-hole structures and an associated inhumation cemetery, with evidence of metal working and textile manufacture (Fenwick 1984). The site has been interpreted as monastic.

At Brandon, about a half of a Middle Saxon 'island' settlement was excavated between 1980 and 1987, producing twenty-five buildings including a three-cell timber church (Pl. VII), and two inhumation cemeteries (Carr *et al.* 1988). An intact occupation layer produced most of the finds, which included window glass, vessel glass, imported pottery, styli and silver and gilt decorative metalwork — all highly suggestive of a monastic status. Evidence for building construction techniques was particularly good with timber staining frequent and wood surviving on occasions. Bone was also well preserved.

The recent excavation of what appears to be a complete and very small settlement at Whitehouse on the outskirts of Ipswich is a welcome addition to the evidence. Two buildings were present, separated by a substantial fence, within a ditched enclosure covering some three quarters of a hectare with a third building outside the enclosure. The associated material culture was poor in comparison with other excavated sites.

At Hinxton Hall, a loose cluster of four or more sunken-featured buildings and at least one surface-laid building were excavated.

Evidence of settlement hierarchy is emerging clearly in the Middle-Saxon period and further systematic evaluation is a major research objective. Clearly there must have been settlements involved in the redistribution of goods between the 'urban' centres of London and Ipswich and the simple farmsteads or hamlets with a purely agrarian economic base. Royal vills are an obvious candidate. Many of the sites are known but none have (knowingly) so far been excavated.

Monastic settlements may also have performed a central place function perhaps operating as mini-wics, with direct access to the exchange network. The term monastery at this period appears to imply an advantageous legal status rather than just religious function. Brandon, with no documentary evidence of monastic status has both church, religious artefacts and styli.

The disappearance or hiatus in occupation of the region's monastic sites dates to the period of the Danish conquest and settlement of the later 9th century, prior to its recapture by the 'English' in the early 10th century. There is very little archaeological evidence of Scandinavian settlement in the region but the number of Viking-type disc brooches known has greatly increased in recent years as a result of metal detecting (Margeson 1996). However, at Waltham, King Canute's standard bearer, Tofig, is said to have held a hunting lodge and a hall claimed to be of a Norse tradition and dated late 10th/early 11th-century has been excavated just north of the church (Huggins 1976).

There has been little excavation of Late Saxon settlements in the last twenty years. Most building plans recovered were a by-product of excavations focusing on earlier periods of occupation. In Norfolk buildings/barns were excavated at Attlebridge and, at Tasburgh, excavation indicated that the camp fortification (or refortification) took place during the Late Saxon (?Danish) period (Rogerson and Lawson 1992). In Suffolk, apart from a small excavation on the Late Saxon settlement at Brandon which did not produce buildings, the only excavated building of this date was at the recent Ipswich (Whitehouse) site.

The Springfield Lyons (Chelmsford) excavation in Essex revealed thirteen buildings of varying size spanning the 10th and 11th centuries (Buckley and Hedges 1987). Eight were post-built, three were foundation trench type and two a combination of the two techniques. The largest building contained a hearth and appears to have been the hall surrounded by a range of agricultural buildings including barns, cart sheds, and animal houses.

Elsewhere in Essex a single Late Saxon building was excavated at Chignall St James (Brooks 1992) and excavations have shown the Middle to Late Saxon origin of several church-hall complexes, such as Asheldham (Drury and Rodwell 1978), Pentlow Hall (Andrews 1991) and Rivenhall (Rodwell and Rodwell 1986) but it is not clear whether these ever formed the basis for nucleated settlements.

In Herts Late Saxon settlements have been excavated at Caldecote (Beresford 1978), Pirton and Letchworth (Matthews and Burleigh 1989). In Cambridgeshire, sunken-featured buildings of Late Saxon date have been excavated at Guilden Morden (Richmond and Burleigh 1992), a timber-framed structure at Spaldwick (Schlee and Spoerry 1996), a stone-built tower at Stretham (Horton and Lucas 1990) and an important settlement at Hinxton Hall. The latter produced several 'halls', the largest of which was 15m long, mostly within a roughly rectangular enclosure and associated with ovens, wells and rubbish pits.

Economy

The agricultural economy of the Early Anglo-Saxon period shows a continuity with the preceding Iron Age and Roman pattern both in terms of cereal production and animal husbandry. The main discontinuity appears to have been in the 7th century after which there is evidence for specialised production and adaptation of farming systems to local conditions (see IV below).

The clear evidence for a substantial rise in population size and density in the Middle Saxon period is not surprising as the period was one of rapid economic expansion which included the birth of towns, especially Ipswich, and the need to generate agricultural surplus to support craft specialists and the needs of powerful Royal dynasties.

The discovery of a previously unsuspected phase of Middle Saxon activity in the Norfolk Fens was one of the major achievements of the Fenland Survey. Seven sites, all represented by substantial scatters of Ipswich Ware, were found regularly spaced in an arc across the area, implying a planned resettlement, possibly linked, and subsidiary, to an estate centre in upland Norfolk. Evaluations of three of the sites appear to confirm that they were engaged in summer stock rearing and that butchery (and salting) probably took place on site. The lack of metalwork on the sites (in contrast to many of the upland sites in Norfolk)

Plate VII The Middle Saxon church excavated at Brandon, Suffolk. *Photo: R. D. Carr, copyright: Suffolk County Council*

reinforces their likely utilitarian function (Leah 1992, 54–56).

Fisheries were clearly important along the region's coastline. In Essex, aerial photography has revealed the remains of wooden fish-weirs at several locations, notably off Bradwell and Mersea Island (Clarke 1993, Crump and Wallis 1992). At one site they were constructed of substantial timber which has yielded radiocarbon dates of 640–75 and 882–957 AD. 'It is tempting to see these structures as associated with the early Monastic foundation at Bradwell' (Rippon 1995). In terms of craft production there have been metallurgical analyses of cruciform brooches (Mortimer 1990), and a study of funerary pots (Richards 1987), indicating local workshops producing recognisable products with a widespread distribution. A major study of Ipswich Ware is currently being undertaken by Paul Blinkhorn.

Little progress has been made in refining the chronology of the Thetford-type wares in the region, or the Early Medieval wares. More light has been shed, however, on the rural production of Thetford-type wares by itinerant potters in Norfolk with the addition of a kiln at Bircham

(Rogerson and Adams 1978a) to that excavated at Langhale (Wade 1976).

For both the Middle and Late Saxon periods the evidence for craft production in the towns (especially Ipswich and Norwich) is now excellent but the distribution of the products is an unknown quantity because of the lack of rural settlement excavation. This is a crucial area of study for the future and of interest to both urban and rural studies.

Little has been done to assess the large quantities of coins and metal objects which have resulted from metal detecting. The exception is a corpus of Anglo-Saxon metalwork from Suffolk (West forthcoming).

Culture/Religion

For the Early Anglo-Saxon period there has been some interesting discussion about the significance of grave goods from the cemeteries (Pader 1982; Richards 1987; Filmer-Sankey and Pestell forthcoming). Filmer-Sankey has argued strongly for burial rite as a statement dominated by religious belief and ethnic origin rather than status.

For the Christian period there have been few pre-Norman church excavations, apart from in Essex where timber churches have been found under the stone churches at Cressing (Hope 1984), Rivenhall (Rodwell and Rodwell 1986), and West Bergholt (Turner 1984). In Suffolk, there is the Middle Saxon church at Brandon (Carr *et al.* 1988), which is not on the same site as the present parish church.

III. Medieval

During the Medieval period, the population grew again — a marked expansion in the 12th/13th centuries was followed by a sharp decline in the 14th century (partly associated with the Black Death), and a steady recovery in the 15th century.

The range of monuments includes standing structures, such as castles, monasteries, churches and chapels and the earthwork remains of moated sites and rural settlements. It is these obvious sites which have tended to attract research.

Significant excavations have taken place on castles in Norfolk, at Castle Acre and Castle Rising (Coad *et al.* 1982 and 1987), in Essex at Pleshey (Priddy 1988) and Rayleigh (Milton and Walker 1987), and in Suffolk at Eye. There were excavations of churches in Norfolk, at Bowthorpe, Barton Bendish, Guestwick, and Framingham Earl (Rogerson *et al.* 1987); in Essex, at Cressing Temple (Hope 1987), West Thurrock (Harrold 1991), West Bergholt (Turner 1984), Little Oakley (Corbishley 1984) and Little Holland (Andrews and Brooks 1989); and in Suffolk, at Onehouse.

Greens are a major element of the medieval settlement patterns on the clay lands of the region. They have been quantified as a resource in Norfolk and Suffolk (Barringer 1993; Martin 1988) but no assessment of their importance has been made.

Despite the fact that the region has the highest total of moated sites in England, they have received surprisingly little attention, apart from general statements about the resource in Norfolk and Suffolk (Rogerson 1993; Martin and Aitkens 1988).

Moated sites have been excavated at Hempstead (Rogerson and Adams 1978b) and Kelling, Norfolk; Brome (West 1970), Exning (Martin 1976), Stowmarket and Tattingstone, Suffolk; and Writtle, Essex (Ecclestone and Reidy 1992).

In addition excavation at Southchurch Hall, Essex, provided a valuable insight into a manorial centre *c*.1300 (Jackson 1987).

Survey work has identified many new deserted settlement sites from surface scatters but there has been no systematic survey of earthwork sites surviving on ancient pasture or in woodland. Pilot surveys have been conducted in both Norfolk and Suffolk which show a low survival rate, emphasising the importance of those which remain.

Most rural settlement was clearly not deserted and lies under present-day villages. No asessment of their archaeological potential has been undertaken, and most of the vacant plots within them have now been infilled with modern development.

The study of rural settlement patterns has been largely the province of landscape historians and historical geographers in recent years (see Warner 1982 and 1996; Williamson 1993). There has been little archaeological work on specific sites. In Norfolk there were useful surveys of deserted villages with earthworks at Pudding Norton, Roudham, Godwick, Waterden, Great Palgrave, Egmere, Bixley, and Little Bittering (Cushion *et al.* 1982) but there has been no significant excavation since Grenstein (Wade-Martins 1980) and Thuxton (Butler and Wade-Martins 1989).

In Suffolk only individual house sites have been excavated at, for example, Hitcham and Haverhill. In Essex, sites were excavated at Chignall St James (Brooks 1992) and Stansted, where at one site three timber structures of 12th/13th-century date went out of use in the 14th century and at the other a single building had a similar lifespan (Brooks 1987). At North Ockendon, a farmstead which probably grew up as a result of assarting, apparently went out of use by 1500 (Wilkinson 1988). More recently an isolated farmstead was excavated at Stebbingford (Fig. 9). It comprised a house, granary and byre and was occupied from the late 12th to the mid 14th century (Medleycott 1996). Only a limited amount of work has been done on rural industry. More research was completed on the Grimston potteries in Norfolk (Leah 1994) and a tile kiln was excavated at nearby Shouldham (Smallwood 1978). In Cambridgeshire, the first rural (late) medieval pottery kiln has been excavated at Colne, and a late medieval pottery industry has been identified in the Waveney Valley, Suffolk (Martin *et al*. 1985).

The lack of excavation on rural medieval sites in the region is clearly accompanied by a lack of environmental evidence (see IV below).

There is a clear need to research rural settlement patterns and their origin. The region contains both nucleated and dispersed settlement and it is not clear why one or the other developed. Non-nucleated settlement is often a feature of low population densities (such as in south-west England) but there are areas, such as Essex, where there was considerable population growth in the early medieval period and yet the dispersed pattern of settlement remained (Taylor 1983). The pattern is similar to that of the Iron Age and Roman one but it is ill-defined. Chris Taylor has argued that a large number of nucleated villages were deliberately planned by local Lords of the

Figure 9 Stebbingford Farm, Felsted, Essex. This reconstruction *(copyright Peter Froste)* depicts the farm in the mid 13th century, with Stane Street in the background. The farm buildings include a kitchen/hall, an open-fronted byre and a two-roomed building with the midden and cess-pits immediately to its rear

Manor, sometimes on new sites, but often on older ones (Taylor 1983, 147) between the 9th and 13th centuries. This was often associated with the creation of open field systems. Such a model requires testing on the medieval settlement patterns of our region.

As part of their Monument Protection Programme, English Heritage are funding a series of projects involving the mapping of rural settlement diversity (Roberts and Wrathmell 1995). The results should assist in the formation of research questions for rural settlement studies in the future.

IV. Environment and Economy

by P. Murphy

There is still much debate on the extent of post-Roman woodland regeneration. Dendrochronological evidence indicates widespread Saxon use of timber from trees which started growing in the early 5th century: probably these timber trees developed from abandoned Roman short-cycle coppice or grew from seedlings colonising abandoned farmland (Tyers *et al.* 1994). However, pollen, macrofossil and sedimentological evidence from palaeochannels (*e.g.* Sandon Brook) and meres (*e.g.* Micklemere, Pakenham) indicates, to the contrary, that there was no large-scale woodland regeneration (Murphy 1994). Minor regeneration phases detected in long pollen sequences (*e.g.* at Diss Mere) are not reliably dated by radiocarbon, and their attribution to the immediate post-Roman period is no more than surmise. At Micklemere, open landscapes were maintained by grazing, but cereal pollen was not detected on post-Roman sediments, reappearing only about 1290BP (Wiltshire 1988). On molluscan evidence, the last phase of the Bran Ditch near Fowlmere was constructed in an environment of damp calcareous grassland (Murphy 1993b). Palynological studies of 7th-century wells at Slough House Farm produced assemblages with tree pollen under 5% and cereals up to 14% (Wiltshire and Murphy 1993). No doubt some woodland expansion must have occurred, at some locations, presumably mainly at the periphery of existing woods, where trees would later have been most accessible for felling.

The limited palaeoeconomic data suggest some continuity of agricultural production. Charred Early Anglo-Saxon crop remains have come from Springfield Lyons, Spong Hill, Redcastle Furze (Thetford) and West Stow; and impressions of crops remains on pottery from Mucking have also been examined (Murphy, 1985, 1990, 1995a, 1995b; Van der Veen 1993). Crops identified comprise spelt, bread wheat, barley, oats, rye, horsebean and pea. Records of spelt (the main Roman wheat crop) from three of these sites imply continuity of production through the 4th and 5th centuries. At West Stow (Crabtree 1989), animal bone assemblages from Early Anglo-Saxon contexts were dominated numerically by sheep (60% MNI), though cattle would have provided most of the meat. Pigs were relatively important in the early 5th century, declining in representation thereafter. Horses, goats, wild mammals and freshwater fish were also present. Crabtree argues for an essential continuity from Iron Age and Roman animal husbandry: no sharp break is discernable either in terms of sizes of animals, butchery methods, species ratios or ageing distributions. The small animal bone assemblages from Redcastle Furze and Spong Hill,(the latter probably biased by preservational factors), were cattle-dominated (Bond 1995; Wilson 1995).

The main discontinuity in arable production seems to have been in the 7th century, on present evidence. The few known Middle Saxon charred crop assemblages (from Staunch Meadow, (Brandon), Ipswich and sites on roddons in the Norfolk and Lincolnshire Silt Fens do not include spelt: the main cereal crops are bread wheat, rye, six-row barley and oats, with peas, horsebean, hemp and flax/linseed (Carr *et al.* 1988; Murphy 1987, 1991, 1994a). There is clear evidence for flexible adaptation of farming systems to local conditions: rye, drought-tolerant and well-adapted to growth on dry sandy soils, was the main cereal at Brandon, whilst at sites on the Silt Fens, vulnerable to marine flooding, the salt-tolerant crop six-row hulled barley predominated, with oats, pulses and flax. Very similar assemblages have been reported from coastal sites in the Netherlands (Behre and Jacomet 1991, 91), where a similar agricultural system seems to have developed independently. At Brandon, flax and hemp pollen and deposits of flax stem waste associated with hemp remains and dye-plants pointed to textile processing, and probably to local cultivation of fibre crops on the wet soils of the valley floor (Carr *et al.* 1988; Wiltshire 1990). Palynological and macrofossil evidence for predominantly pastoral land-use on the Blackwater terraces has come from 7th-century wells at Slough House Farm, Heybridge (Wiltshire and Murphy 1993): a very open landscape of damp weedy grassland, but with cultivation or processing of cereals, flax and hemp nearby.

Faunal remains from Anglo-Saxon rural sites are reviewed by Crabtree (1994). The largest published Middle Saxon bone assemblage is from Wicken Bonhunt: over two-thirds of the large domesticate mammal remains were of pig, implying some specialised, high-status function for the site.

Late Saxon charred crop remains have come from Springfield Lyons (Murphy 1990a). The main crop was oats, with bread wheat, six-row hulled barley, rye, horse-bean, pea and flax. Interestingly, there were traces of emmer and spelt at this site, presumably persisting as contaminants of other crops, and hinting at long-term continuity of production. The relative abundance of stinking mayweed was thought to indicate cultivation of some heavy clay soils. A 13th-century farm on the Essex Till plateau at Round Wood, Stansted produced an assemblage dominated by bread wheat and rivet-type wheat, with oats and some barley, rye and flax/linseed (Murphy 1990b). Pulses (horsebean, pea, vetch) were common: medieval agricultural productivity was limited by inadequate supplies of manure (Bolton 1980, 34), and legumes were of great importance for maintenance of soil nitrogen levels. Land molluscs showed that this site was in a woodland clearance. A medieval site at Parson Drove has produced a similar assemblage of charred crop remains (Murphy, in prep.). Evidence for fibre crop processing has come from a medieval pit at Scole, which produced pollen assemblages including a high proportion of hemp and nettle (Wiltshire, in prep): the latter plant, rarely well-represented palynologically, is known to have been used to produce a fine fibre in the Middle Ages.

There are very few published rural medieval bone assemblages from the region. Parson Drove produced a fishbone assemblage dominated by eel, carp-family, herring and smelt (Irving 1995) and a collection of

mammal bones. Sheep was the commonest species, and neonatal bones point to rearing on site (Albarella, in prep.). Substantial Late Saxon and medieval animal bone assemblages have come mainly from urban sites (see below).

Construction of a fenland Sea Bank at Clenchwarton did not pre-date the 11th century (Leah and Crowson 1994, 46). From foraminiferal and sedimentological evidence a construction sequence has been proposed (Murphy 1994b, fig. 1). Thereafter, settlement expanded from the zone between the sea bank and inland peats (Waller 1994, 79). In the Thames Estuary, submergence of Roman occupation surfaces must relate to Thames V (Devoy 1979). Saxon activity in the Essex estuaries is marked principally by construction of extensive fish-trap complexes (*e.g.* at Collins Creek (ECC, undated; Murphy 1995c). Dendrochronology places a timber framework inside the sea-bank at Foulness in the late 15th century (Crump 1981).

V. Conclusion

Research carried out from the late 1960s to the mid 1980s has provided a valuable insight into the nature of the resource for the region in the post-Roman period. A significant number of large-scale excavations provided the first scientifically collected data for Early, Middle and Late Saxon settlements and cemeteries; medieval villages, moated sites, churches and castles.

As such, these sites represent little more than a pilot survey of the resource. Most were selected because they were threatened with damage or destruction and appeared to be either well preserved or prolific in artefacts. The hierarchy of sites to which they relate is largely unknown, and they have proved difficult to interpret in isolation. Since the mid 1980s there have been few genuine research excavations or systematic field surveys. Excavation has been largely rescue and is now increasingly restricted to small-scale evaluation trenching. The results of the latter remain, in most cases, to be assessed but their importance should not be understated. Evaluation trenches should provide valuable insights into the nature of the total population of settlement including the variability of survival of evidence and the size of excavated samples required to provide reliable evidence.

While in isolation the artefactual and ecofactual evidence retrieved often seems meaningless, it could begin to allow distribution maps of artefact types to be produced on a regional scale.

However valuable recent work may be, it is clear that if we wish to see significant advances in both our academic and conservation objectives in the future, we must adopt a more pro-active approach to research. This can only be achieved when archaeologists and not developers set the agenda.

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Anglo-Saxon, Medieval and Post-Medieval (Urban)

by Brian Ayers

I.Introduction

Towns are complex and diverse institutions with complex and diverse relationships to their hinterlands. This complexity and diversity increases with time, leading to the existence of numerous discrete palimpsests, each with extraordinary potential for enhancing understanding of human society, economy and culture.

East Anglia is fortunate in that it possesses a wealth of historic towns, many originating in the pre-Conquest period, each with considerable (and, in some cases, great) archaeological potential. This potential is characterised not simply by buried stratigraphic deposits and artefacts but also by topography and built structures, the detailed interdisciplinary study of which can provide wide-ranging evidence of social processes and actions.

The range of evidence is so great that, in order for this regional framework to form an effective outline, it is structured under five broad headings: Demography (looking at population density, distribution and structure); Social Organisation (examining settlement, ranking, status and urban institutions); Economy (outlining craft production, technological innovation, exchange and communications); Culture and Religion (exploring art and religion); and Environment.

The periods to be examined are as follows: Middle Saxon (650–850); Late Saxon (850–1066); medieval (1066–1600); and post-medieval (1620–1820). These period definitions have been chosen in order to provide a document which allows the urban perspective to be compared with the framework for rural society.

II. Demography

The relationship of demographic indicators to the revival of urbanism in post-Roman East Anglia has been but little explored. Darby (1952) remains the most important synthetic work for the early period although increasingly there is evidence from archaeological work in both urban and rural areas which could be used to provide information on probable patterns of population change and the implications for urban growth. This calls for greater interaction between methodologies and research aims for rural and urban sites in order to maximise potential and increase understanding of the demographic pressures which affect urban growth.

Allied to this is the study of settlement distribution, the relationship of proto-urban and urban settlements to the rural hinterland and the density of population within settlements.

Within towns the potential of archaeological data for exploring the development of urban populations needs to be considered actively, with the examination and definition of methodologies for assessing populations and population structure. This is particularly important for Middle Saxon and Late Saxon towns, where archaeological evidence will comprise the bulk of the available data, but the opportunity also exists for archaeological methodologies to test the implications of historical data in the medieval and post-medieval periods. Recent work by historians such as Rutledge (1988) can imply considerable variation on traditional assumptions about medieval populations, with impacts on demographic considerations such as housing and provisioning.

For the post-medieval period, often one of considerable demographic and other change in towns, there is great potential for archaeological study of deposits, buildings and processes to complement the increasing documentary evidence (as outlined in Ayers 1991).

III. Social Organisation

With the exception of Ipswich (Wade 1993), there has been little work on the establishment of towns in the Middle Saxon period in East Anglia. Much remains to be achieved in terms of basic data collection and model testing across the region. Emphasis needs to be placed on centres such as Cambridge, Norwich, Thetford and Colchester (especially given the apparent absence of Middle Saxon activity at this last location) but the possibility of proto-urban settlement at other, smaller, sites should not be discounted. In this context, the effect of London also needs to be considered, particularly for the southern part of East Anglia, an effect which clearly grows in later centuries.

The study of urban growth needs to establish social context and here the relationship of royal vills and other high status sites to early urban settlement should be a fruitful area of study. Examples from Essex and Suffolk can be cited but other potential sites exist elsewhere (for instance at Thorpe, an important manor to the immediate east of Norwich).

The impact of the Danes on urban life in East Anglia must be assessed (see Clarke and Ambrosiani1995 for Danish urbanism). There is considerable tangential evidence for Danish activity at Thetford, Norwich, Ipswich, Cambridge, Colchester and other places but a great deal more research is needed before the scale of Danish activity can be understood. It seems probable that the Danes were a formative influence on the early growth of Norwich (Ayers 1996) and this is unlikely to be an isolated example.

Late Saxon growth is both better documented and generally better understood. A number of burhs seem to have been founded in Essex in the early 10th century (such as Witham, Maldon and the re-establishment of urban life in Colchester). Other burhs are known at Hertford, Kingbury and Huntingdon and one probably existed at Cambridge. Fortifications in both Ipswich and Norwich of suspected Danish date could have been re-used for 10th-century burhs. In addition there are a number of settlements which seem to have burghal status, such as Horndon and Newport in Essex and possibly Tasburgh in

Figure 10 Location of places mentioned in the text: Anglo-Saxon, medieval, post-medieval (urban)

Norfolk, but which subsequently shrank to be little more than villages.

Complex social systems seem to have appeared in burghal settlements during the 10th century although the generally poor East Anglian documentation from the period renders archaeological evidence the more important. It is known from the *Liber Eliensis* that the towns of Norwich, Ipswich, Thetford and Cambridge were of such status by the 980s that their citizens did not need witnesses and it is also known that mints existed at all four locations. There were 10th-century mints at Colchester and Maldon and, by the 11th century, mints too at Huntingdon, Hertford, Sudbury and Bury St Edmunds.

Information from evidence as diverse as church foundations and street pattern metrology is already helping to identify stages of urban growth. The complexity of the problem, however, is perhaps best illustrated by Thetford where it is still not possible to characterise, even in general terms, the chronology, distribution and social status of occupation across the borough despite the site being largely an open one (although now much reduced by development). The other Late Saxon boroughs of East Anglia lie beneath modern towns, the necessity for a research-oriented archaeological approach being therefore all the more necessary.

The ranking of settlements can be undertaken in a crude way by analysing the mint data but the potential exists for a more sophisticated approach which will enable towns to be assessed as elements within the local and regional economy, rather than simply as adjuncts of royal power and control. The political dimension of towns must also be explored, nevertheless; it has recently been shown that the town as a political concept is a valid area of archaeological study (Carver 1993) while, at a detailed level, there is now some evidence to suggest that the spectacular growth of Norwich in the 11th century was, in part, the result of deliberate policy rather than fortuitous happenstance as a result of a favourable geographical position (Ayers forthcoming).

The importance of individuals and institutions in urban growth must not be underestimated; obvious examples for study in the pre-Conquest period are Bury St Edmunds and Waltham Abbey although the importance of both lay and ecclesiastical magnates can also be explored elsewhere. Post-Conquest foundations such as that of the Bishop of Norwich at Lynn or the Bishop of London at Chelmsford can be cited as towns where evidence can be sought for the impact of such plantations upon the hinterland as well as for a deeper understanding of the concepts of urbanism as understood at the time of foundation and as mutated in subsequent centuries.

The inter-relationship of urban settlements needs to be examined through archaeological data as well as historical sources. The East Anglian urban landscape is atypical, being characterised by a few very large towns with varying numbers of smaller settlements. Indeed, it could be argued that, just as Norwich came to dominate much of the economy of northern East Anglia, so London dominated the south.

This dominance of great towns became even more marked in the medieval period, with London and Norwich certainly becoming ever more complex societies. The decline of other towns, such as Ipswich and Thetford, is an under-explored area while the rapid growth of coastal ports, large (Great Yarmouth and King's Lynn), medium (Harwich) and small (Wiveton), provides examples of specialist towns at an early period.

Notwithstanding the growth of great towns, there remains much to investigate concerning the origins of other urban settlements. Bassett (1982) is a rare example of a small town study. In Suffolk, besides Ipswich, burgesses are recorded at Dunwich, Eye, Sudbury, Beccles and Clare by 1086 with, additionally, markets recorded at Thorney (Stowmarket), Kelsale, Hoxne and Haverhill. The only one of these towns where there has been a systematic attempt to understand urban development is Ipswich (with some limited work also in Sudbury). In Hertfordshire, it is likely that the towns of Berkhamstead, Hitchin, St Albans, Ashwell and Standon have pre-Conquest origins but evidence is currently lacking. A survey of towns in Essex has been undertaken (Eddy and Petchey 1983) but the paucity of basic data collection and analysis across the region needs to be addressed.

The status of towns gradually becomes more legally-defined in the medieval period but archaeological work has much to offer in determining socio-economic status from primary data. This can be explored at local level in order to understand the relationships within a borough, regionally with regard to inter-town connections and nationally concerning the impact of towns on the body politic.

The complexity of urban organisation must be examined archaeologically as it is only from a deeper understanding of the interweave of social and economic relationships that it will be possible to comprehend the importance of towns as institutions. Data as diverse as environmental material, artefacts, raw materials, geographic location and built structures will all contribute to a greater awareness of the contribution of towns to medieval society. As a single example, the importance of built structures to an understanding of social organisation is becoming increasingly apparent as a result of recent theoretical work (*e.g.* Johnson 1993). The adaptation of towns or parts of towns as circumstances change is also an informative area of study: the impact of castle, cathedral or friary imposition in the medieval period is paralleled by the growth of industrial manufacture towards the end of the 18th century while the results of periods of change such as the Reformation can be identified and characterised through examination of archaeological sites and monuments.

This study of social organisation must investigate the entire range of the urban experience. Topography, buildings, craft production, markets, waterfront facilities, defences, ecclesiastical institutions, cemeteries and environmental evidence all need to be evaluated and the available information synthesised. The interdisciplinary opportunities offered by towns are great and, to date, have only been exploited at a handful of places (*e.g.* Carter 1978).

IV. Economy

Archaeological evidence has much to offer any study of the urban economy and of the inter-relationship between urban activity and the produce of the countryside (*e.g.* Hall and Kenward (eds) 1994). Fundamental problems of the change from a subsistence economy to one of surplus need to be investigated so that the preconditions for urban growth within post-Roman society are more fully

Figure 11 Prospect of Norwich *c.* 1581 by Georg Hoefnagle. Viewed from the west with the spire of the cathedral visible in the centre

understood. Allied to this, the early development of the mechanics of exchange and trade, particularly in relation to political expediency but also with regard to a developing merchant class, can be explored.

Within East Anglia, the only urban settlement where a comprehensive assessment of the early economy has been attempted is Ipswich. There remains a great deal of basic data to extract from sites of potential such as Norwich but much useful information will probably derive from study of other sites which were, at best, merely proto-urban, such as Brandon or Burnham (Norfolk) or early sites on the Fen edge.

Isolating the potential range of economic activity will help assessment of the diversity of trade and therefore commercial life. Communications need to be studied, together with status of trade links and their potential for stimulating urban growth. There is increasing evidence of contact between east coast ports and the Frankish Empire; it is less clear whether this contact represents the gradual development of a market economy or a more constrained sequence of exchange with little impact upon everyday society.

Once again, the impact of the Danes is a major consideration. It is probable that urban economies were stimulated towards growth in the last decades of the 9th century, so much so that by the second quarter of the 10th century, boroughs like Norwich, Ipswich and Colchester were able to form integral parts of the administration of the region.

The development of craft industries has long been recognised as a key component of urban growth and detailed appraisals of the processes and products of these industries remain important elements of study. Great strides have been made in gaining a better understanding of the importance of the pre-Conquest East Anglian ceramic traditions (*e.g.* Atkin *et al*. 1983) but more remains to be done in terms of synthetic work on distribution and patterns of trade as well as in consideration of the detail of the industries themselves. The pottery industry, however, is only the most visible such craft activity and there remains little work in depth on other aspects of the Late Saxon economy.

The effects upon that economy of the Norman Conquest have frequently been targetted but the Saxo-Norman period remains one where the growth of the urban economy is still only marginally understood, the influence of towns within the national economy requiring much greater study. The gradual growth of towns, particularly from the 12th century onward, has yet to be examined comprehensively with the role of small towns being almost ignored. Nearly 40 places in Suffolk had the right to hold a market by the end of the 15th century; clearly only a proportion of these developed into significant towns but the impact of each on the local economy and the overall impact upon urban/rural relationships remains to be explored. Understanding of the complexity of the medieval urban economy remains rudimentary in terms of processes and the mechanics of exchange. In particular, the potential for developing an understanding of such processes through study of international trade and contacts, especially with Scandinavia, the Baltic, the Low Countries and Germany, is very great. Much can be demonstrated from documentation and artefacts with regard to products but how production, output, distribution and exchange effected the urban environment and society in general is less clear.

This is true with perhaps greater force in the post-medieval period where attempts to explore the urban economy through archaeological material are rare. There has been little examination of post-medieval industrial processes in towns and much potential information

concerning commercial activity could be obtained from a targetted approach to the potential of archaeological material. Once again, relationships with the hinterland need careful consideration in order to assess more fully the role of any one town as well as towns in general within the overall socio-economic framework.

V. Culture and Religion

It can be argued that, while towns provide food, shelter and security, they also foster spiritual nourishment. This less tangible attribute is one rarely acknowledged as a preserve of archaeology and yet it is one which can and should be addressed as an area crucial to the development of any civilised society and certainly of central significance to west European culture.

The importance of the church as an influence in urban development is undeniable with church buildings and locations remaining determinants within modern urban topography. The relationship of the church to urban origins and growth is a fundamental consideration in any urban settlement and needs to be studied at a variety of levels. While the parish is a basic building block within urban society, the inter-relationship of parishes and their contextual location imparts much useful information and demands attention.

The role of larger ecclesiastical institutions within urban areas is one which is but infrequently explored by archaeologists. Details of friary layout and hospital plan are becoming more common but the impact of such institutions upon the surrounding urban, and indeed rural, area is little studied. At an economic level, the creation of church buildings and their ancillary structures and support systems was a crucial stimulant to growth and archaeological assessments of the impact of the church as both client and innovator need to be undertaken. The diversity of the urban economy owes much to the church with its extensive requirements.

The church was influential in the spread of material culture but such distribution was assisted by the cosmopolitan nature of towns. The richness of urban archaeology, both above and below ground and especially for the later medieval and post-medieval period, ensures that towns offer unique opportunities for examination of material culture and the mechanics of its dissemination to the wider community. The manner in which the urban experience influenced the development of distinct cultures can also be explored archaeologically. Technological innovation, artistic developments and the adoption of new materials and practices can be examined within an urban context, individual towns frequently developing distinctive products which exploited a general growth in commercial activity and imparted a cosmopolitan approach to everyday society. Archaeological methodologies need to recognise that urban culture itself is distinctive and must be examined in order to study the processes of urbanisation.

VI. Environment and Economy

by P. Murphy

A question of particular interest is how 'urban' were the earliest post-Roman town populations: were they, from their beginnings, primarily engaged in consumption and re-distribution, or is there evidence for agricultural production and processing? Thus far, it has not been possible to demonstrate pre-urban agricultural phases conclusively from biological evidence.

At Fishergate, Norwich, 10th-century ditches cut into valley floor peats produced a wet grassland plant macrofossil assemblage suggesting local pasture or meadow. The ditches were, however, infilled with typical urban refuse — bone, plant food wastes and a synanthropic insect fauna with woodworm beetle, flea and louse. (Kenward and Allison 1994; Murphy 1994b), and were subsequently covered by dumped refuse layers. At Ipswich, charred crop remains from both Middle and Late Saxon deposits consisted mainly of grain with, overall, very little chaff or weed seeds: there was virtually no evidence for on-site primary crop processing (Murphy 1987, 1991a and in prep.). Bread wheat was the main crop, followed by rye, hulled barley, and oats, with horse-bean, pea and hemp. Charred germinated grains of barley from Middle Saxon contexts and charred masses of hops from Late Saxon ones indicated malting and brewing. Burnt 11th-century cellared buildings included dense charred granary deposits of oats and barley: in one case coarsely ground oat/barley malt grist, associated with charred loaves of wheat/rye flour.

Very similar results have recently been obtained from pre-Castle deposits at Castle Mall, Norwich (Murphy, in prep.). Again, the main activities represented were cereal storage and malt-drying. Evidence for malting has also come from medieval ovens at Alms Lane, Norwich (Murphy 1985a) and Redcastle Furze, Thetford (Murphy 1995a). A few deposits of unprocessed crops have been recovered at Norwich: at St Martin-at-Palace Plain a batch of very small-grained rye and barley with chaff, straw and abundant leguminous weeds was thought to indicate cultivation of nitrogen-depleted soils (Murphy 1988b). However, the vast majority of samples from the city were grain-dominated, and thus of 'consumer-type'.

At all urban sites investigated, latrine pits including a wide range of mineral-replaced and waterlogged plant food residues were present. For example, 11th-century and later pits at St Martin-at-Palace Plain (Murphy 1988b) produced remains of cereals, pulses, flax, hemp, opium poppy, celery, fennel, coriander, hop and many fruitstones and seeds, including 'exotics' such as medlar, mulberry, grape and fig. In general, early pits include few 'exotics' and more macrofossils of wild fruits. Latrine pits, it should be noted, are rarely encountered at rural sites, and their presence from the earliest phases at Norwich and Ipswich may imply that human waste was not being agriculturally re-cycled.

The growth of urban populations inevitably increased demands for supplies of food and other raw materials. Mammal bone assemblages from Middle Saxon Ipswich and Late Saxon and medieval Norwich were dominated by cattle, with sheep, pig and traces of goat and horse (Crabtree 1994; Jones 1994). Deer and other wild animals were rare, though rabbits (from managed warrens initially) were relatively common at some sites by the later Middle Ages (Cartledge 1988). The relatively large assemblage of bird bones from Alms Lane was mainly of domestic fowl and goose, but included wildfowl (Harman 1985). At Colchester, cattle and sheep were the most important stock animals in the Middle Ages. Wool production was of great importance, and continued so until recent times, but during the post-medieval period there was a dramatic increase in

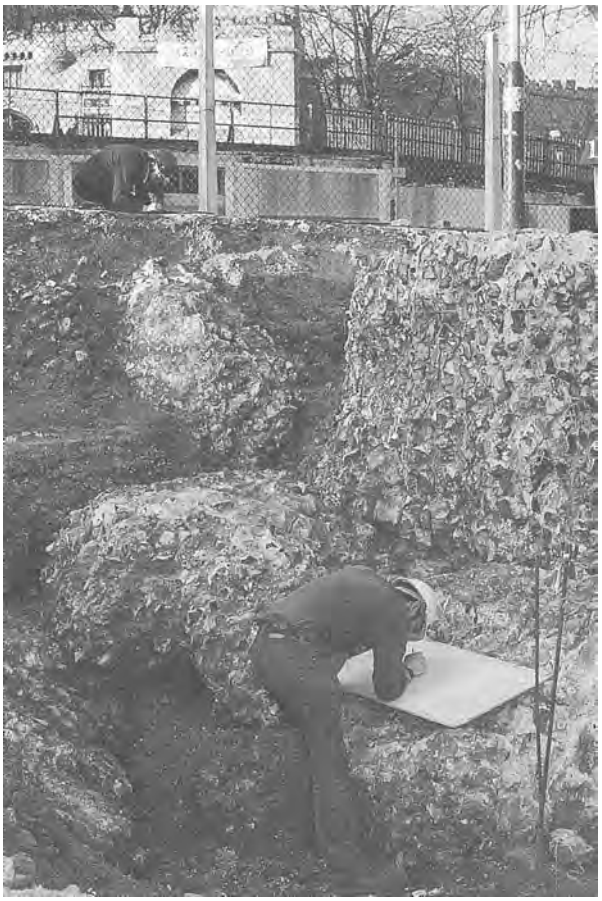

Plate VIII Excavation of 'barbican' gateway at Castle Mall, Norwich. This fragment lies on its side and was probably deliberately demolished in the 18th century. *Photo: Kirk Laws-Chapman, copyright Norfolk Museums Service*

veal and milk production (Luff 1993, 127–138). Studies of mortality profiles should provide further data on the ways in which local farms adapted their economies to the urban demand for meat and other products. A large animal bone assemblage, spanning the 9th to 18th centuries, has recently been reported from Castle Mall, Norwich (Albarella, in prep.). Beef was the main meat eaten at all periods, though pork was important in the early phases and mutton in the later: most material was butchery and food refuse, though the working of bone, horn, antler and leather were represented. Assemblage composition indicates that there was local stock-rearing up until post-medieval times, which (apart from pig-rearing), ceased thereafter. From late and post-medieval deposits there is evidence for increased animal size, (notably of domestic fowl), and for morphological changes related to the 'agricultural revolution'.

Marine food resources were also increasingly exploited. At Culver Street, Colchester fish bones were markedly more common in Medieval deposits than Roman ones: mean 5.5 bones/litre of soil compared to 1.8 bones/litre (Locker 1992). Eel, herring and cod were most abundant, freshwater fish very rare. Locker suggests that a specialised Medieval fishing industry based on netting for herring and line fisheries for cod was represented. Fishbones are exceedingly common in Saxon and medieval urban deposits at Norwich and elsewhere: the overwhelming predominance of herring, with eel, cod and whiting and other species is quite consistent (Jones and Scott 1985; Locker 1988, 1994). Marine mollusc shell is likewise common: besides the predominant oyster, mussel, cockle, winkle and whelk, other species including razorshells were consumed. At Fishergate, Norwich abundant shells of small inedible marine species were probably refuse from the cleaning of a catch prior to sale (Murphy 1994b). Most marine crustacean remains from Norwich post-date the early 15th century, implying that the products of the Cromer Crab fishery were not reaching Norwich in quantity before then (Murphy 1985b).

Urban development would obviously have increased demand for fuel and constructional wood and timber. Recent work at Castle Mall (Murphy, in prep.) has shown that fuel wood was supplemented by heathland fuels (heathers, gorse/broom — perhaps supplied as charcoal), crop processing waste and peat (though the latter has proved difficult to demonstrate incontrovertibly). Middle and Late Saxon waterfront structures at Bridge Street, Ipswich and St Martin-at-Palace, Norwich were mostly of roundwood, but later structures included more timber, mostly of oak (Murphy 1988b, in prep.). Saxon well-linings at Ipswich included one constructed of re-used barrel-staves with a tree-ring sequence spanning AD 539–744, and matching chronologies from Mid-South Germany (Groves 1987, 1987a; Hillam 1989). Burnt 11th- century cellared buildings from Ipswich were mostly of oak timber, but included hazel wattling and various charred wooden items, including basketry of willow and hazel (Murphy 1987, 1990). Pine was present, perhaps imported, and a deal plank also came from a 14th/15th- century revetment at Bridge Street. Charcoal from burnt late medieval buildings at Pottergate, Norwich showed attack by ash bark beetle and death watch beetle (Murphy 1985b).

Evidence for social status of site occupants has rarely been demonstrated. The abundance of 'exotic' plant foods from a 15th-century latrine at St Martin-at-Palace Plain (Murphy 1988, 121) is notable. Refuse deposits in the Barbican well and other deposits at Castle Mall did not produce dietary evidence for high-status occupants (Albarella, Murphy, in prep.), even though this was the site of a Royal castle. Parasitic nematode ova have been reported from Norwich (Jones 1994), whilst dumped 11th- century layers at Fishergate included an insect fauna indicating abundant decomposing material, with human bedbug and flea (Kenward and Allison 1994). There is little evidence for post-medieval introductions of exotic species, apart from a 17th-century turkey at Alms Lane, and pumpkin/marrow and parrot from Castle Mall (Albarella, Murphy, in prep).

VII. Conclusion

The potential of towns for dramatically increasing knowledge concerning the growth of pan-European economies and societies at a formative period in western culture must not be underestimated. The information base is still inadequately sampled and the urban potential of deposits, buildings, artefacts, ecofacts and palaeo-ecological diversity ensures that towns remains priority areas for research.

In general terms each of the major towns of East Anglia should be regarded as a single, exceptionally complex, site with potential for increasing understanding

of urban communities in general and local communities in particular. The interaction of such communities with the local environment and the rural hinterland must be seen as a major area of research development. Archaeological research in towns should view the entire urban environment as worthy of study, particular emphasis being placed on topography and buildings as well as below ground features and deposits (Ayers 1993). Waterfront deposits are especially important in this regard.

The slow growth of other, smaller, towns must also be examined. Here, the ports of the north and east coast are important, having considerable potential for developing understanding of commercial activity and port provision.

Towns in East Anglia contain the greatest densities of rich medieval deposits, surviving buildings, churches, industries, artefact assemblages, documents and varieties of palaeoecological data in the region. Settlement sites vary from one of the greatest cities in western Europe to abandoned ports. Urban research needs to capitalise upon the potential of towns in order to develop a more coherent understanding of the contribution of the region to national and international society.

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Post-Medieval and Later

by Paul Gilman, Jenny Glazebrook, Shane Gould and Sarah Green

I. Introduction

by Jenny Glazebrook

The apparent ubiquity of post-medieval remains and the richness of the documentary record generates uncertainty amongst archaeologists about the degree to which archaeology could or should be involved in research directed at this period. To what extent will archaeology deepen our understanding of the region in the years after 1500, rather than simply providing illustration of what is already understood?

Crossley (1990, 1) argues that the number of national and county journals now publishing post-medieval material, in addition to the coverage provided by the period journal *Post-Medieval Archaeology*, indicates a general recognition that an archaeological approach is just as valid for this period as for earlier ones. Despite increased record-keeping from the 16th century onwards, documentary coverage is neither complete nor particularly informative in some respects. Much of the written record is quantitative rather than qualitative, and the mass of ordinary people hardly figure at all. An interdisciplinary approach should be the basis for interpretation of the historical past, in which archaeological evidence enhances and enlivens documentary sources, resulting in a fuller, wider picture.

This chapter, arguably the most difficult one to produce, began as a section on industrial archaeology (see Buckley, above), and has evolved in a rather piecemeal way since. Perhaps this in itself reflects something about the current state of post-medieval archaeology in the region. A number of major aspects are not covered in this chapter, such as the rural landscape before Parliamentary Enclosure, vernacular building, and pottery industries centred on Harlow and Lowestoft in the 17th and 18th centuries. Such omissions are the result of a lack of expertise within the archaeological establishment of the region rather than a disregard for their value. Crossley (1990, 2) comments on the 'compartmentalized specialization' of post-medieval archaeology, and the fragmentary nature of the discipline may account for the difficulty in finding an author prepared to contribute a general overview of the period.

The world heartland of the Industrial Revolution may lie in the midlands and northern England, but East Anglia was in the forefront of the 'Agricultural Revolution' of the 18th century, and communications and many industries were developed to serve the farming economy (see section IV below). Information supplied by the five counties indicates that much of the recording and researching of industrial remains and vernacular buildings is carried out by local societies, and that only some of this information has been transferred onto the SMRs. Despite the fact that the region has a wealth of farm buildings dating from the medieval period onwards, only a few of these are protected as Listed Buildings, and very little work has been done to survey this resource. East Anglia's 'front-line' position relative to the Continent has meant that the region is well-endowed with military remains but these have also been poorly covered in SMRs, although recent survey initiatives will improve the situation (see section II below). Archaeology has made a considerable contribution to the study of designed landscapes, and there is increasing recognition of the importance of interpreting parks and gardens in social terms (see section III below). Recent survey initiatives in the region will augment the English Heritage Register of Parks and Gardens, published in the 1980s.

II. Fortifications

by Paul Gilman

Introduction

With a long and low-lying shore facing the continent, East Anglia was often considered to be at risk from raiding and invasion during the post-medieval and modern era. As a result, the region contains examples of most, if not all of the major types of defence adopted from the time of Henry VIII onward. There is, therefore, great potential for the study of the development of fortification during this period.

From the 16th to the 19th centuries defences were almost entirely located on the coast, at points considered most vulnerable to seaborne attack. Ports and harbours such as Harwich, Great Yarmouth and King's Lynn received particular attention, as did the Thames Estuary since this provided direct approach to the capital. Indeed, some sites retained their strategic significance for most, if not all of the period under consideration and contain evidence for several periods of activity. Towards the end of the 19th century and especially during the World Wars attention was given to providing more systematic defence in depth as well as the need to counter airborne attack. The latter requirement continued after World War II but with the rise of airborne and in particular missile-based attack methods the importance of artillery waned and formal coastal defence was brought to an end in 1956. However, the presence of important airfields in the region meant that it continued to play a key part in the strategic defence of the country. With the threat of nuclear attack, civil defence also remained a priority, with the construction of early warning and command bunkers. Following the end of the Cold War, many airfields and other structures have become or are becoming disused, thereby adding to the stock of structures available for study in East Anglia.

16th century

East Anglia was included in the first comprehensive scheme for national defence introduced by Henry VIII in 1539. Most of these structures were relatively insubstantial blockhouses and small forts, few of which have survived, a rare example being the blockhouse at

Figure 12 Location of places mentioned in the text: post-medieval and later

Cudmore Grove, East Mersea in Essex (Priddy (ed.) 1983). The next major threat to the country was posed by the Armada in 1588 but on the whole this resulted in the refurbishment of the existing fortifications rather than new works.

17th century
After the Armada scare was passed, few new fortifications were constructed, notable exceptions being the new forts at Landguard Point to defend Harwich harbour and a new fort at King's Lynn. During the Civil War the region was held firmly for Parliament, providing a rare requirement for defence from within England. The region's defences were again refurbished, notably at King's Lynn, but relatively few new fortifications were built, for example earthworks at Earith and Horsey Hill, near Peterborough (Kent 1985, 238–239). Ironically, the only significant military actions were the sieges of King's Lynn in 1643 and, in 1648, of Colchester by Parliamentary forces. At Colchester, elaborate siege works were constructed but these appear to have survived only in contemporary plans.

Later in the 17th century, following a Dutch incursion into the Thames, one of the region's most impressive defences, Tilbury Fort, was built. This was subsequently much modified but excavations in 1973 and 1980 have helped to establish the original layout (Wilkinson 1983). The value of the region's fortifications was proved in 1667, during the Second Dutch War, when Landguard Fort withstood an attack by a substantial Dutch force (Kent 1985, 105–107).

18th century
Few new defences were added during the 18th century, the significant exception being Landguard Fort, rebuilt in 1715 and again in 1744.

19th century
The Napoleonic wars saw the next great threat of invasion and the resultant need for major new coastal defences. A chain of martello towers was added to the south and east coasts, including Essex and Suffolk. New artillery batteries were introduced, notably the large redoubt at Harwich. Inland, defensive earthworks were also constructed including extensive emplacements around Chelmsford (RCHME 1992).

Later in this century, the increasing pace of technological innovation lead to an arms race between the development of warships and shore-based artillery. For example, large casemated fortifications were built in the 1860s and 1870s at Coalhouse and Languard Forts but these rapidly became obsolete. Therefore, new, more low-key batteries had to be commissioned, at Coalhouse Battery at East Tilbury and Beacon Hill Fort at Harwich. Inland, a scheme for the defence of the capital was finally introduced in the late 19th century based on the 'London Defence Positions', of which North Weald Redoubt in Essex is a fine example. These were defended storehouses to be linked with trenches by the army in the event of a serious threat of invasion.

20th Century
During World War I there was little threat from large-scale invasion, although additions were made to the coastal defences in the form of gun batteries and pillboxes, and the major forts were again put into readiness. This conflict was also marked by the introduction of airfields and anti-aircraft batteries.

Following the outbreak of war in 1939, belated efforts were made to bring the region's defences to readiness. However these pale into insignificance compared to the colossal scale of the works put in train following the fall of France in 1940. The General Staff faced the prospect of attempting to resist highly mobile armoured formations, supported by paratroops and airpower, with relatively little by way of tanks and heavy weapons. The solution which was adopted was that of a system of 'stop lines' consisting of gun emplacements, pillboxes and anti-tank obstacles. These would, it was hoped, contain an invading force, giving sufficient time for the regular army to assemble and deal with the threat. A number of these stop lines cross the region, beginning with the coastal 'crust', bolstered by gun batteries and minefields, and ending with the London defence rings. There was a considerable RAF and American Air Force presence in the region throughout World War II, resulting in the construction of many airfields and air bases for fighters and bombers. After 1945, the Cold War meant the continued maintenance of major air bases and the need for a network of Civil Defence structures, to act primarily in the event of a nuclear attack.

Archaeological research to date
The most comprehensive account of post-medieval defence sites in East Anglia is that by Kent (1985), although this does not include Hertfordshire and is restricted to artillery fortifications. As with industrial sites, the region's Sites and Monuments Records have been relatively poor in their coverage of military archaeology. However, this is gradually being improved by survey initiatives. In some counties, extensive surveys of World War II defences have been carried out or are underway, notably in Essex (Gilman and Nash 1996, Thorpe 1996) and Hertfordshire. Military works are also being recorded by the National Mapping Programme (Ingle and Strachan 1996) which should eventually cover the whole region. Assessment of documentary sources by the CBA for English Heritage is resulting in much more comprehensive knowledge of the total numbers of works of various types which were actually built during both World Wars (Dobinson 1996). By way of contrast, there has been relatively little detailed survey, exceptions being the recording exercises by the RCHME at Beacon Hill, Harwich; Bowaters Farm in Thurrock (RCHME 1994a), and Stow Maries in Essex.

III. Parks and Gardens 1540–1960
by Sarah Green

Introduction
Parks and gardens are worth assessing separately because they form such a frequent, distinctive and significant part of the English landscape. They occupy an appreciable proportion of the land. On the other hand, from a cultural and historical point of view they can not be considered separately from country houses, architecture and the social and economic conditions necessary for their existence.

The scope of this assessment also includes a very cursory glance at open spaces whose primary function was not that of a pleasure garden or private park, *viz* churchyards cemeteries, physick and botanical gardens, that contain some element of design to please the eye.

Other spaces that deserve some consideration, but have been excluded through lack of time or by the rather arbitrary selection of the date span chosen for this report, include warrens, deer parks, allotments — not only for fruit and vegetables but as ornamental, detached pleasure gardens — nursery and market gardens, urban and cottage gardens.

The aim of this assessment is to pick out good examples in the region of fashion, influences and innovation; to enable people to identify deficiencies in registration and set priorities for further work; and to provide a bibliography.

The starting point, *c.* 1540, can be used to explain some of the less visible factors that underlie and should inform study of gardens (but all too often don't). The decade of the 1530s saw the Dissolution of the Monasteries and other religious houses in England and Wales. At a stroke a major institutional patron of gardens, and element of continuity ended a tradition that was characteristically medieval, and a lot of land passed into private ownership.

A persistent problem reflected in the literature until relatively recently is that this subject is dominated by aesthetics, local and subjective points of view. Analytical studies that relate these spaces to the social economic and political context are rare (a notable exception is Tom Williamson's *Polite landscapes*, 1995).

The two main journals for this topic are *Garden History*, the journal of the Garden History Society, and *Journal of Garden History*. Items of interest are also to be found in *Landscape History*, the newsletters of the County Gardens Trusts and the Victoria County Histories. Elliot (1986), Lambert *et al.* (1995), Jacques (1983) and Thacker (1979) provide a useful background to the subject. Other publications such as Taylor (1979), Brown ed. (1991) and Jacques ed. (1997) reflect the growing relationship between archaeology and garden history.

Chronological and typological overview

This section outlines the main developments and characteristics of English gardens, as exemplified in the five counties.

By the 1540s Renaissance ideas and motifs were in fashion at court, and garden design was one aspect of this important development. The new fashions were overlaid on medieval traditions of garden layout, and medieval styles and habits lingered, forming a backdrop and basis for new experiments. Knots and allees were the most obvious features of these early Renaissance gardens, and they remained important elements until long after the Tudor period. The square knot remained fashionable in smaller gardens until the end of the 17th century although by this time the elaborate 'parterre de broderie' was a standard feature in larger, more up-to-date gardens. No original Tudor knots survive, however, and documentary and pictorial evidence dates only from the later Tudor period (Harvey 1988). Towards the end of Henry VIII's reign (died 1547) religious and political refugees and scholars from the Continent began to have an appreciable influence on English horticulture, and the recognisably scientific study of botany began.

The great gardens of Elizabeth's reign (1558–1603) tended to be divided into a privy garden for family use and more public grounds for the conspicuous display of status (*e.g.* Theobalds near Cheshunt, Herts). Sir William Cecil, Elizabeth's great chief minister, later the first Lord Burghley, created this courtyard house in 1575–85. Its garden was inspired by French design, and the very large scale of its layout was to have great influence subsequently. Theobalds comprised a privy garden in the form of an open knot, and a 'Great Garden' subdivided into nine knots, the central knot containing a fountain.

Good cartographic evidence backed up by documentary research exists for Thorndon Hall, Brentwood, Essex, the seat of the Petre family. John Walker's map of 1598 covers 2,585 acres and shows the formal but asymmetric garden layout which includes an orchard and the surrounding estate providing a detailed account of the land management. The subsequent history of the site is mentioned below. There are of course numerous examples of parks and gardens whose origins can be traced back to medieval deerparks. One example is Childerley Hall, near Cambridge, where the probably 16th-century moated gardens were restored and replanted in the 1950s. Other examples of 16th-century gardens are Kentwell Hall (Suffolk), where remains of 17th-century fruit espaliers and avenues survive; Stiffkey Old Hall (Norfolk), where fragments of 16th-century walled garden survive, and Melford Hall (Suffolk).

As the 17th century opened, continental influences steadily increased. Grottoes, fountains, terraces and highly elaborate parterres — the latest fashion in knot gardens — were typical of this style (Anthony 1972). A good example are the gardens of Hatfield House (Herts), which were remodelled when the house was rebuilt in 1607–12 for Robert Cecil, Earl of Salisbury (related to William Cecil, Lord Burghley, and like him, the king's chief minister). The garden remained basically an enclosure, within which large-scale naturalistic, or exaggerated, water features such as lakes, islands, artificial rivers and cascades became increasingly important.

Gentry at all levels were affected by these trends in garden fashion, indicated by sites surviving as earthworks and by literary and documentary evidence. The influence of garden-makers such as William Lawson was immense, leading to the widespead adoption of raised walks, view-points, mounts (or mounds), towers, and moats. Isaac de Caus was possibly influential in the design of the garden created by Lucy Harrington, Countess of Bedford, at Moor Park, Rickmansworth (Herts), and remade in the 18th and 19th centuries.

Gardens developed a classical simplicity in plan, based on squares and rectangles, usually with a raised terrace on the side of the garden opposite the house. Such a terrace might incorporate a banqueting house, grotto or arcade, or a combination of these, and might extend along the other sides of the garden, as for example at Much Hadham (Herts). Many of the gardens of the period are illustrated in birds-eye perspective views by Kip and Knyff (1714–15). Although nearly all the best early 17th-century gardens have disappeared or been transformed, pictures, map-views and descriptions of them survive and a few examples of their planting are extant, where they have been incorporated in later gardens. At Gorhambury, St Albans (Herts), Sir Francis Bacon created an elaborate water garden in the early part of the 17th century, using medieval fishponds. It is possible that he wrote his essay *Of Gardens* here in 1625.

Following the restoration of the monarchy in 1660, the most striking and innovative designs were typically in the grand French style of Le Notre (1613–1700) who

designed the gardens at Versailles, characterised by canals and avenues aligned on the central axis of a symmetrical house front, or else laid out in a so-called goosefoot, in which several avenues radiated from a single point. These avenues provided long and symmetrical vistas, comparable to the Baroque architectural vistas being created in certain continental cities at this time. A great enthusiasm for planting trees was fostered by John Evelyn, the diarist, among others. He designed Euston Park (Suffolk), later remodelled by Brown and Kent. Cassiobury Park near Watford (Herts) was one of these great gardens, designed by Moses Cook for the Earl of Essex, and notable for its avenues of wild cherrries and fine woods.

The accession of William III (previously the Dutch head of state) in 1689 set the seal on Dutch influence on English culture. A distinct style of Dutch garden had developed, characterised by its formal but smaller scale, greater intimacy, the use of clipped evergreen topiary, sunken rectangular water gardens, pergolas, rectangular moulded lead flower and water butts, and so on. The Dutch style, relatively intimate, domestic, modest and bourgeois, remained popular in smaller gardens to the end of the 18th century, despite the ridicule of articulate leaders of fashion like Addison.

In the 18th century new garden design was to undergo fundamental changes in both philosophy and practice. Rather than the hand of man being seen to impose order on nature, the garden came to be seen as an opportunity to idealise nature. The integration of the garden and its surrounding rural landscape was the logical result. English garden plans in the first half of the 18th century were still markedly architectural and geometric, but they became progressively more naturalistic, largely at the hands of professional landscape gardeners and designers such as Lancelot 'Capability' Brown and other designers of national or regional fame.

Excellent intact examples of early 18th-century formal gardens are Houghton Hall (Norfolk), designed by Bridgeman in the 1720s for Sir Robert Walpole, the prime minister, and St Pauls Walden Bury (Herts), where avenues are aligned on suitable landmarks, including temples and statues all set very exceptionally in woodland. Sometimes traces of such geometry can be detected underneath later more naturalistic landscaping, as at Burghley House (Cambs). Earthwork remains of a formal garden with successive terraces and ponds, are visible at Gamlingay (Cambs). Blickling Hall (Norfolk) is basically late 17th/early 18th-century with later additions.

Between 1715 and 1760 gardens showed considerable individuality, as landowners built up stocks of newly introduced and exotic plants, which superseded clipped evergreens. An excellent example of this enthusiasm and knowledge is to be found in the eighth Lord Petre (1713–1742) at Thorndon Hall (Essex), whose plant collections and methods of cultivation were the envy and wonder of his contemporaries. The grand scale of the designed landscape at Thorndon Park is typical of French influence.

An indication of the explosion in new plant varieties and growth in foreign trade is provided by the estimate that by 1700 some 1400 plants had been introduced, a figure that had risen to 14,000 by the end of the 18th century. Trade catalogues show what was available and being grown.

Classical idiom still had an eminent role to play in the design and enjoyment of even the biggest gardens and garden-landscapes. The Palladian ideal, very influential in England in the first half of the 18th century, was to integrate the rural landscape and the country house (or 'villa', explicitly recalling its Classical prototype). Away from the house, the presence of temples, nymphaea, 'sacred groves' and 'sylvan glades' lent verisimilitude to a recreated, semi-mythological, pastoral landscape. Holkham Hall (Norfolk), one of England's principal landscape parks, had both house and park designed by Kent in the 1720s and 30s (with help from Lord Burlington and Thomas Coke, Lord Leicester, the landowner).

Town gardens, meanwhile, even in a fashionable centre of design such as Bath, might be formal and geometrical as late as the accession of George III (1760).

Much has been written about 'Capability' Brown whose vast earth-moving exercises and characteristic use of water and immense sweeps of trees epitomise the English landscape style. Some landscape parks and woodlands whose 'capabilities' were realised include: Copped Hall (Essex) in the 1740s; Burghley House, (Cambs) in the 1750s; Audley End (Essex), where Bridgeman and Richard Woods also worked, Wimpole Hall (Cambs), Euston Park and Ickworth Park (Suffolk), Kimberley Hall, Holkham Hall and Melton Constable (Norfolk), and Thorndon Hall (Essex) from the 1760s onwards; Youngsbury near Ware (Herts) in the 1770s; and Heveningham Park (Suffolk), in 1781.

The final phase of Georgian park and garden design was dominated by Humphry Repton, though he died in 1818 some 12 years before the end of this period. This was another turning point in that gardens had begun to be seen as 'works of art rather than of nature'. Examples of Repton's work can be seen at Catton Park (Norwich), thought to be Repton's first landscape commission; Wimpole and Milton (Cambs), Sheringham Hall, Norfolk, (which he called his most favorite work), Ashridge and Cassiobury (Herts) (Malins 1976). Smaller commissions include Riffhams, Saling Grove and Spains Hall in Essex.

A new social consciousness was emerging, manifested in many ways: in the opening of the first public botanical garden in 1802 (in Liverpool); in the appearance of gardening journals in the 1820s and 30s spreading the new ideology of gardening to the middle classes (John Claudius Loudon, 1783–1843, a leading figure in this field, was responsible for the landscaping at Stradsett Hall, and Gillingham Hall, Norfolk). In addition, industrialis- ation and urbanisation began to cause enormous economic, social, cultural and, eventually, political changes. In the countryside, fortunes founded on the exploitation of mineral rights or trade and industry were as important as those founded on agricultural land-ownership. The more extensive parks and gardens could rarely exclude the public, as they were often crossed by highways and public rights of way. In all there was a reaction against the great landscape park which had removed all evidence of human industry or occupation.

The 19th century saw a wide variety of fashions in vogue, both successively and simultaneously. At Audley End, Essex, the parterre was designed in 1830–31. The gardenesque style which embodied the theories of J.C. Loudon and so called as being appropriate for gardens and pleasure grounds, became popular, mixing the formal and the informal (Loudon 1822). Also in the 1830s studies of

past architectural styles led to a revival of Elizabethan and Jacobean gardens with low box hedging, coloured gravels and parterres of great complexity.

The Italianate style was influenced by the Grand Tour as travellers who observed the great surviving continental geometric gardens produced the set pieces of terraces, gravel, statues, clipped laurel and tazzas at home — as at Copped Hall near Epping, Essex. Shrublands Park, Suffolk, has elaborate and extensive Italianate terrace gardens by Charles Barry 1848–52; one of the most famous 19th-century gardens of its kind. Another good example of a formal garden was created at Somerleyton Park, Suffolk, between 1844–62 which included a maze and winter gardens.

The rustic style evolving from the 1790s remained in vogue into the 1850s with its rustic furniture, the cottage ornee and thatched summerhouses. The term villa was attached to suburban houses with relatively small gardens, the houses rarely isolated but often set back from the road, at least symbolically.

In the 1840s the removal of a glass tax and repeal of a window tax led to a boom in the building of glasshouses and conservatories. This encouraged the rapid development of a taste for bedding-out schemes and the potential to produce a riot of colour in intricate patterns.

Before the 1840s publicly accessible urban gardens and open spaces had comprised generally the gardens of inns, tea-houses and pleasure gardens, graveyards and burial grounds, and the gardens of botanical and horticultural societies. These latter, and also zoological gardens, increased in number during the early years of the century. The Botanic Garden in Cambridge, opened 1846, was laid out as a formal landscape by its first curator. It was also the site of one of the first rock gardens in the country (Taigel and Williamson 1993).

During the 1840s recreation grounds and public parks began to be provided for the public good by local benefactors (Conway 1996). A fine example, rather later in the century, is the Braintree and Bocking Public Gardens (Essex) which was given to the town by the Coutauld family in 1888; a Trust Fund was established by them for the upkeep of the gardens. Also in the 1840s the General Inclosure Act of 1845 provided for land to be set aside for recreation when commons and wastes were enclosed. Improving land- owners made provision for gardens in the model cottages they had built for their labourers, to encourage a sober and provident workforce. By the end of the century municipal public parks had become a recognised expression of civic pride, boasting bandstands and regimented flower beds. During the 20th century new parks continued to be created. They were designed both by well-known garden designers and landscape architects but more commonly by borough engineers and park superintendents. The five registered sites which form a set of public parks laid out in Norwich in the 1920s and 30s were designed by the parks superintendent Captain A. Sandys Winch.

The rapidly expanding population of 19th-century Britain meant that the question of the disposal of the dead became critical. The Rosary Cemetery in Norwich is the first English burial ground that can properly be called a cemetery, set up privately by a nonconformist minister in 1819 on market gardens outside the walls of the medieval city. J.C. Loudon was involved with both urban parks and cemetery design, writing prolifically on the appropriate layout, planting design and ultimate cultural and environmental value of each. Histon Road Cemetery in Cambridge was designed in the year of Loudon's death (1843) and was implemented much as he had planned. This was among the first of the cemeteries set up as a public utility available to all. As a result of the Burial Acts of 1852–7 a national system of public cemeteries was created. Burial Boards set up throughout the country and public competitions were advertised through journals like *The Builder* for the design of cemeteries and cemetery buildings. These included in 1854 Bury St Edmunds (Suffolk), 1855 Soham (Cambs), Ipswich (Suffolk), Braintree, Colchester, Harwich and Saffron Walden (Essex), 1865 Rickmansworth (Herts). Cemetery design continued to flourish throughout the 19th century and up until the Great War. Unfortunately many of these designed landscapes, like the public parks, have not reached their full maturity due to neglect or destruction (Brooks 1989).

The last quarter of the century saw at least two influential developments evolve: the arts-and-crafts movement, with its emphasis on the use of local materials, and the Japanese style. Examples of the latter include gardens at Fanhams Hall near Ware and the Garden House, Cottered (Herts), both early 20th-century (Symes 1993).

The influence of William Robinson (1838–1900, who wrote among other inspirational works *The Wild Garden* (1870) and indeed added one to Shrubland Park in 1888) and Gertrude Jekyll (1843–1932) was strong on 20th-century gardens. Knebworth and Putteridge Bury (Herts), were among many Lutyens-Jekyll early 20th-century designs. The Pleasaunce, Overstrand, Norfolk, is a small formal, architectural garden designed early in the 20th century by Edwin Lutyens.

The garden city and the National Trust were started at the turn of the 20th century: popular movements to open and preserve 'natural countryside' for public enjoyment, inspired by the arts-and-crafts appreciation of the moral effect of the aesthetic environment (Waterson 1997). In this context, 'natural countryside' was a new term, defined as a public good in reaction to unplanned industrial and urban despoliation of the land. Letchworth Garden City, the first of these, was designed by Ebenezer Howard and development began there in 1903.

During the Edwardian period golf courses appeared in the (suburban) countryside. Their major elements, the boad expanses of grass with belts and clumps of trees, were exactly the same as those of the 18th-century landscaped park.

Regional examples of work by well-known 20th-century designers include gardens by Lanning Roper (Abbots Ripton (Cambs) for Lord de Ramsey in the 1950s and 60s, also Ickworth (Suffolk) and Sainsburys Centre for the Visual Arts at Norwich, though these are outside our period) (Brown 1987); Ellen Willmott (the wild garden at Warley Place near Brentwood, Essex, from the 1890s to WWI); Harold Peto (Easton Lodge, Essex, Italianate and Japanese gardens for the Countess of Warwick in 1903); Frederick Gibberd (The House, Marsh Lane, Harlow and Harlow Water Gardens). In addition to this group of internationally famous designers and writers there are many noteworthy gardeners who have created perhaps one or two gardens. Beth Chatto's gardens and nursery at Elmstead Market near Colchester in Essex is a good example.

State of knowledge

It is only relatively recently that designed landscapes and historic gardens have been recognised as being equal in importance for our cultural heritage as buildings and sites which have been granted statutory protection and a recognition in the planning process . Only since 1995 have the Garden History Society been statutory consultees when planning applications affect a historic garden.

The English Heritage Register of Parks and Gardens was compiled and published between 1984 and 1988, now subject to updating and augmentation. However it has been estimated that 'in England...the 'national' list includes approximately 10% of significant gardens in any given area' (Dingwall and Lambert 1997). This situation is now being remedied by surveys undertaken by a combination of local authorities, county gardens trusts and by consultants. However, inclusion in the Register has no definite implications for planning decisions (unlike the listing of buildings, on which it is modelled). PPG15 advises Local Planning Authorities to pay heed to the inclusion of a garden on the Register, and to consider its setting, but this is exhortatory only.

In Norfolk and Suffolk a survey of the non registered parks and gardens has been undertaken by UEA. The Norfolk survey results, compiled by Tom Williamson and shortly to be published in *British Archaeological Reports*, have been added to the SMR (info T. Williamson and E. Rose). A similar process is happening in Suffolk although this is at an earlier stage (info T. Williamson and C. Pendleton).

In Essex, the county gardens trust is beginning a desk-top, systematic cartographic survey to identify all potential parks and gardens of historic interest (info F. Cowell) This done, a second stage will identify sites worthy of survey and more detailed work. The trust liases with local authority conservation officers and English Heritage. An unofficial list of parks and gardens worthy of further research is held by the planning department. The Cambridgeshire gardens trust are also at an early stage of an area by area survey (info E. Stazica).

Hertfordshire County Council have already completed a rough survey. A map and aerial photograph search revealed 430 possible sites of which *c.* 40 were deemed to be of listable quality. This list is the subject of scrutiny by English Heritage and some of these sites will go onto the Register. Hertfordshire Gardens Trust are adopting an area based approach to a more detailed study of the initial list of sites and have already published their findings from one area (info M. Vollard and A. Mallinson).

Both Essex and Hertfordshire County Councils have recorded the registered parks and gardens on a GIS as part of the planning process. A move towards the integrated recording of landscapes which include archaeological sites and buildings is evident in this development.

In the English Heritage Register for the five counties there are 173 entries. This compares with Ray Desmond's *Bibliography of British Gardens* in which he lists a total of 570 sites in these counties. His bibliography does not always include gardens that were subsequently identified and included in the Register.

In this table, the SMR categories of parks, gardens and garden features are not necessarily exclusive, and a single site may be represented in more than one of these categories. Sites are counted only once, however, to make the SMR total.

county	*Desmond*	*Register*	*SMR parks*	*SMR gardens*	*SMR garden features*	*SMR total*
Cambs	64	33	21	18	6	45
Essex	143	36	34	63	-?	76
Herts	136	39	39+40	-	-?	79
Norfolk	120	46	124	94	-?	?
Suffolk	107	16	-	-	-?	?

Urban Parks have been specifically targeted by the Urban Parks Programme of the Heritage Lottery Fund whose aim is to regenerate existing urban open spaces whether parks, pleasure gardens or historic cemeteries. The criteria for funding is based not only on the heritage merit of each space but also on its public amenity benefits and its importance in a local, regional and national context.

IV. The Archaeology of Industrialisation and Manufacture 1750–1960

by Shane Gould

Introduction

The period 1750–1960 is one of enormous socio-economic and technological change, and these effects have had a profound impact on the historic landscape of Essex, Cambridgeshire, Hertfordshire, Norfolk and Suffolk. In the mid-18th century East Anglia was at the fore-front of the so-called 'agricultural revolution' with the creation of great estates based on the best available scientific advice; model farms were a completely new concept often transforming many of the more traditional agrarian practices. The introduction of turnpike roads and improvements to inland navigations were closely allied to the growth of farming and the need for effective and efficient communications primarily with London. Ironworks and foundries were established to serve the farming industry and rural produce supplied a growing number of maltings, breweries and corn mills.

The use of lime as a fertiliser and for building purposes was widespread throughout the region during the 18th and 19th centuries, and lime kilns were often located on the floor of chalk pits or beside ports and creeks. Brick manufacture was also an important industry, but many of the quarries have subsequently been infilled. In the 16th century East Anglia was a major centre of the woollen industry and although this declined in the face of growing competition from Yorkshire, the manufacture of certain yarns and products came to be concentrated during the 19th century within parts of Essex, south Suffolk and Norwich.

Many of the old traditional industries began to decline in the early decades of the 20th century and these were replaced by those based on chemical, electrical, vehicular and other new technologies. Chelmsford was a major centre for telecommunications and electrical manufacture, and in Hertfordshire, Elstree and Borehamwood were important sites for the British film industry. Health facilities, education and tourism have become important attributes of post-war industrial society and concerns over future chemical, missile and nuclear war led to the establishment within the region of several governmental research bases.

Alderton and Booker's *Batsford Guide to the Industrial Archaeology of East Anglia* remains the definitive introduction to the subject. Published in 1980 the book provides an overview of the historical/ technological development of the region and a gazetteer gives details of the most important surviving remains; Hertfordshire is however, excluded. More detailed county accounts are provided in J. Booker's *Essex and the Industrial Revolution* (1974), W. Branch Johnson's *The Industrial Archaeology of Hertfordshire* (1970) and R. L. Hodrien's *Cambridge's Industrial Relics* (1976). Articles of interest also appear in the *Industrial Archaeology Review, Journal of the Norfolk Industrial Archaeology Society, Journal of the Suffolk Industrial Archaeology Society, Essex Journal* and *Essex Archaeology and History.*

East Anglia's Major Industries

The following account is not intended to be a definitive list; the major industries are described together with the current state of knowledge. Modern 20th-century industry and in particular post-war developments are an acknowledged weakness.

Transport

Given the importance of farming and the need to move perishable goods, East Anglia was well served with turnpikes. One of the first, the main road to Harwich, was turnpiked in 1696 and road improvements continued throughout the 18th century. Toll houses, mile posts, mile stones and coaching inns are important surviving attributes of the turnpike era.

Inland navigations were equally important and a number of parliamentary acts for the improvement of rivers had been passed before the end of the 17th century. There were many navigations within the region, but few true canals; a formal Trust was created in 1739 to maintain and improve the Lee Navigation, the Stort Navigation was opened in 1769 and the building of the Grand Junction (Union) Canal was completed in 1800. A number of industries including maltings, cement works and chemical works were located on estuarine or coastal sites, and many of the pumping stations on the Fens received fuel by water. Warehouses, quays, granaries, maltings and ironworks were often established in towns served by navigable rivers or canals, and limekilns and small storage sheds were often erected at the head of creeks.

Coastal and estuarine transportation were closely linked, and barges, coasters and other vessels would move goods between the sea and the narrow creeks. King's Lynn was an important port in the medieval period and Lowestoft, Parkeston Quay (Harwich) and Ipswich emerged as important centres during the 19th century.

By 1862 most of the region's rail services were under the control of a single company, the Great Eastern Railway. Its only serious competitors were the London, Tilbury and Southend Railway in the extreme south, and the Midland and Great Northern Joint Railway in the extreme north. Decline and the Beeching cuts in the 1960s led to the closure of approximately half the track and many of the minor routes. Features of interest survive on both abandoned and working lines; these include the stations, signalling and engineering features. The towns of Southend on Sea, Clacton, Lowestoft and Southwold are of particular interest being established as seaside resorts transporting families by train from the capital. Melton Constable, Norfolk, is the region's only example of a railway town. It was erected on a greenfield site for the Midland and Great Northern Railway and has been designated a Conservation Area.

Air travel has become increasingly important since the 1950s, but few of the surviving sites and the supporting manufacturing firms have been adequately studied. The aircraft and aircraft component industries are particularly important in Hertfordshire. De Havilland established their works in Hatfield in 1930 and by the 1960s the industry had become the largest employer in the county. The aircraft and manufacturing complex at Hatfield has recently been surveyed, but several other sites need to be recorded.

Most of the general books on the industrial archaeology of the region have sections on transport. More specific works include *The Turnpike Roads of Norfolk* (Cossons 1952), *The Canals of Eastern England* (Boyes and Russell 1977) and *A History of the Chelmer and Blackwater Navigation* (Came 1976). Much has been written on the railways of East Anglia, but these are essentially historical narratives and few consider the surviving architectural and technological features; key texts include *The Great Eastern Railway* (Allen 1961), *A Regional History of the Railways of Great Britain vol 5 Eastern Counties* (Gordon 1968), *The Midland and Great Northern Joint Railway* (Wrottesley 1970), *A Guide to the Midland and Great Northern Joint Railway* (Digby 1993), *Forgotten Railways: East Anglia* (Joby 1977) and *The Mid-Suffolk Light Railway* (Comfort 1963).

Farming

Farming was for many centuries the most important industry in East Anglia and its monuments have had a profound impact on the landscape. The importance of farming during the medieval and post-medieval period is attested by the many surviving timber framed barns, but ideas and practices were beginning to change in the mid-17th century on the back of rising prices and a growing population. Whilst many timber-framed barns in Essex and Suffolk are late medieval, in Norfolk the 17th century represents a period of rebuilding, with further replacement of timber framing by brick in the 18th century. The period 1750–1820 has been described as an 'agricultural revolution' and East Anglia and Norfolk in particular, were at the forefront of these enormous changes.

The enclosure movement (by act or agreement) encouraged new scientific practices and 'improvements' to be adopted. Plans of model farmsteads and advice on farm buildings were published from 1770 and new crop rotations, manure and the use of artificial fertilisers became widespread. The large landowners, notably Thomas Coke of Norfolk, were very influential; Coke's estate included 70 farms spread over 42,000 acres.

A second boom, the period of the Victorian 'High Farming', took place between 1840 and 1880. Principally based on the rearing of stock, especially cattle, many of the model farms were reorganised in order to accommodate more animals. Interest in the arrangement of farm buildings peaked in 1850 and this was reflected by the growing application of steam power.

The results of the Historic Farm Buildings Project set up within the University of East Anglia have recently been published (Wade-Martins 1991) and a booklet entitled *The East Anglian Farms* is being prepared by English Heritage in their *Understanding Listing* series. Further research is

Plate IX The massive eight-storey, seventeen-bay malting at Mistley, Essex. Erected in 1896–7 by the firm of Free, Rodwell and Co. the Grade II listed building incorporated many important technological innovations.
Copyright: Essex County Council

being undertaken by the RCHME and a major book on the evolution of farms and farm buildings is expected to be published shortly. However, none of the RCHME's sample areas were within East Anglia. Other relevant texts include Brunskill (1982), Brigden (1986), Robinson (1983) and Darley (1988).

Many of the buildings associated with the pioneering farms are already listed, but coverage of the lesser monuments is patchy; Susanna Wade-Martins is currently undertaking a major national survey of model farms for English Heritage. Although much work has been done within the region, it is held by many disparate organisations and individuals, and needs to be collated so that a representative sample of sites can be put forward for statutory protection.

Brewing and malting

East Anglia was the most important barley-growing region in England and this is reflected by the large number of surviving malthouses. The industry dominated several towns including Saffron Walden and Bishop's Stortford (both served by the Stort Navigation), Halesworth, East Dereham, Yarmouth Southtown, Mistley and Ware. Maltings were also a common feature on farmsteads especially during the period 1750–1850.

By the end of the 19th century many of the smaller malthouses had ceased working as a response to the growing rationalisation of the industry, this contraction continued into the 20th century. Many of the surviving examples are listed (predominantly grade II), but this does not preclude their conversion into housing, flats or light industrial units.

A recent survey of the Essex malt industry (Gould 1996) has shown that of the 42 standing examples identified, 27 (64%) had been converted to alternative uses and only 15 retain potentially important internal technological features. A similar pattern occurs in Suffolk where the last floor maltings in the county, Thingoe Maltings at Bury St Edmunds, recently closed and the site is now cleared. Most of the large maltings to the south of the river in Ipswich have also gone, with the survivors very derelict, and what was claimed to be the largest maltings in the world at the time of its construction, in Beccles, is subject to a demolition order. A recent survey of industrial sites in Hertfordshire recorded a similar pattern of decline and reuse.

Brewing was closely associated with malting and the two processes were often found on the same site or in close proximity to each other. Again each town would have had at least one brewery predominantly serving the local market, but their numbers fell as the industry became increasingly centralised during the 20th century. Many have been lost (Norwich for example, had several very large breweries until the 1970s), several listed examples have been converted and only a handful now survive.

The most remarkable brewery to survive in working use in Suffolk is Tolly's turn of the century Cliff Brewery at Ipswich, though Greene King at Bury St Edmunds has some late 18th-century buildings and Adnams at Southwold has a fine 19th-century brewhouse on much older cellars. The Hartford End and Little Coggeshall breweries (Essex), also retain many important 19th-century features; the latter has been fully recorded before being converted into flats. The Hertfordshire survey identified/revisited 36 breweries of which only three survive largely intact and only one (McMullen's) is still used as a brewery. A typical but now rare example of a county brewery survives at Furneux Pelham in East Hertfordshire.

Little has been written on the archaeology of brewing but the best introduction to the Essex industry, albeit from an historical perspective, is Peaty (1992).

Paper-making and printing
Paper-making was initially a mainly rural industry which became widespread in the 18th century although some mills were urban. The earliest documented, at Hertford, was making paper for William Caxton in 1494. The industry was revolutionised in the early 19th century by the introduction of machinery that could produce paper in an endless roll instead of single sheets. In Hertfordshire the industry became a major employer and still retains this status today. In the 1960s it was the third largest employer in the county and several 19th-century mills still operate albeit modernised.

Milling
Much has been published on the study and investigation of East Anglian wind and watermills. Hervey Benham (1976) covers the eastern part of Essex and Reid (1989) provides further information for parts of western Essex. Suffolk windmills are described in Dolman (1979) and A. C. Smith has published books on windmills in Cambridgeshire (1975), Huntingdon and Peterborough (1977). An extensive survey of Essex windmills, their history and technology, was achieved by K. G. Farries and was published in five volumes in the 1980s. Steam-powered mills and in particular roller-milling has received much less attention. These mills were built to serve urban markets, being located beside a railway or docks and their use became widespread towards the end of the 19th century.

The listing of wind and watermills is greater than for any other category of industrial monument in East Anglia. Many have been converted into dwellings, public houses and offices, but the RCHME, local industrial archaeology societies and other interest groups undertook measured surveys of a large number in advance of these works. Conversely, surprisingly few earthwork sites or those with suspected below ground remains have been investigated.

Leather
The manufacture of leather and leather goods was a by-product of the farming industry and tanneries were evenly distributed throughout the area. From the mid-19th century Norwich had a growing boot and shoe industry initially based in small workshops, but these became larger and increasingly mechanised as the century progressed.

Textiles
East Anglia was one of the leading woollen manufacturers in England during the 16th century, but this importance declined as a result of growing competition from the Yorkshire industry. The manufacture of woollens was mostly organised on a domestic basis within small loomshops or dwellings, and large scale capital investment in multi-storey factories only took place when the industry was already stagnating. Certain areas survived by diversifying into the production of specialist fabrics; in Essex, Hertfordshire and south Suffolk silk was manufactured and part of the listed 1818 New Mills at Braintree now houses a working silk museum. Yarn mills were established at Norwich in an attempt to stem the flow of weavers to Manchester. The two most important survive, one as Jarrold's print works and the other as Duffields flourmill; both are now threatened with closure. Loomshops also survive in Haverhill and Sudbury. Horsehair furniture coverings were produced in Glemsford, Ipswich became a home of the corsetry trade and brush-making was undertaken in Norwich and Wymondham.

Apart from brief references in the general industrial archaeological literature (cited above) little else has been published on the East Anglian textile industry and because of this lack of basic information few additional sites would have been protected during the recent thematic review of the industry undertaken by English Heritage. Many of the most important sites are already listed, but further research is needed on the surviving field monuments especially those from the earlier domestic period.

Extractive industries
East Anglia lacks any major mineral deposits and most of the workings were relatively small often serving local needs. The more substantial industries included flint knapping on the Norfolk/Suffolk border, the Norfolk carstone industry, the working of coprolite along the Deben Estuary and in south Cambridgeshire, the sand and gravel workings of Essex, Cambridgeshire and Hertfordshire, and the Cambridgeshire clay pits. The remnants of flint mines can be numbered in their thousands at Brandon and Santon Downham in Suffolk, and at Santon and Thetford in Norfolk. In west Norfolk silica sand extraction was also an important industry and the workings had their own railway system. Chalk extraction and its associated cement industry was particularly important in the Purfleet/Thurrock area of Essex.

The manufacture of lime for agriculture and building purposes was however, more widespread. Kilns could be found on the floor of chalk and cement quarries, on farms, beside towns and ports, and along creeks. Their use was widespread especially in Essex, Cambridge, Norfolk and Suffolk and most of the surviving examples appear to date from the period 1810–1850. Those in Norfolk have been investigated by the Norfolk Industrial Archaeology Society, and a recent survey in Essex (Gibson forthcoming) has found only one intact example; this is being surveyed by the RCHME and will be recommended for scheduling as part of English Heritage's Monuments Protection Programme on the lime industry.

Brick making was also an important East Anglian industry, but many of the works remained relatively small-scale using intermittent kilns (Suffolk, Scotch, Newcastle) until the advent in 1856 of the continuous Hoffman kiln. Principal centres of production included Sudbury, Peterborough, Catton near Norwich, Stourbridge by Cambridge and Great Wakering, Essex. Although several sites remain in operation the majority have closed and a representative sample should be studied in order to understand the historical and technological development of the industry.

Iron Manufacture
Foundries and engineering works came in a variety of shapes and sizes; the majority being located in the towns. Iron for the cupolas or air furnaces was received as ballast in the coasters that traded between London and the north east or in the form of scrap metal. Their trade was predominantly geared to the production and repair of

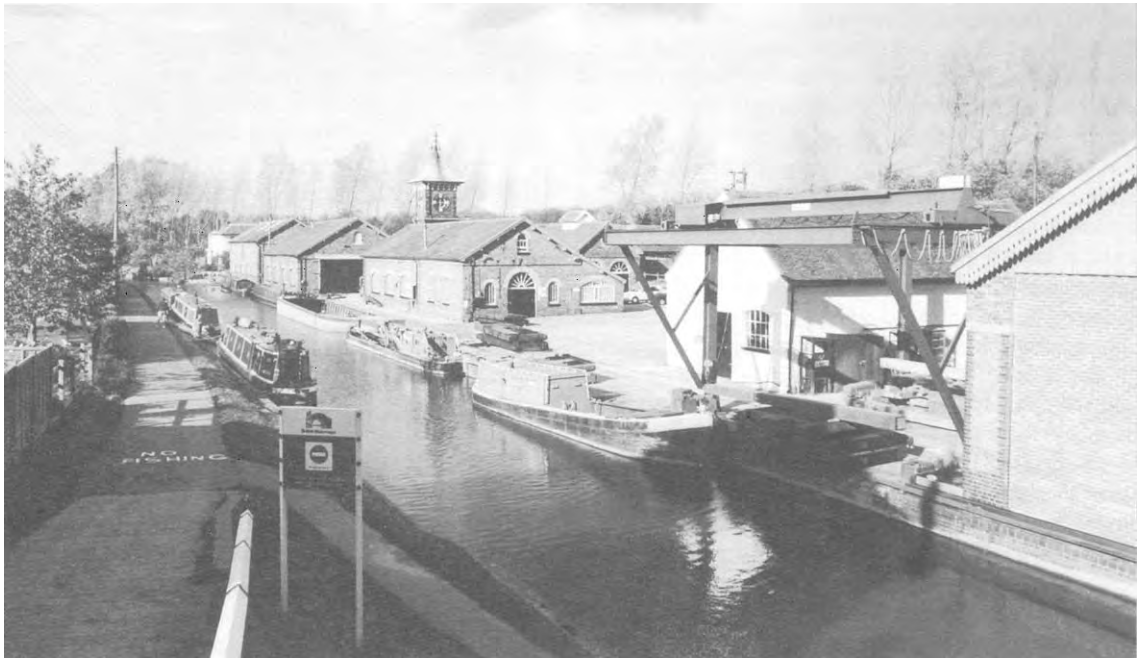

Plate X Bulbourne canal works and boat lift at Tring, Hertfordshire. *Copyright: Hertfordshire County Council*

machinery for the agricultural industry, but some companies specialised in the manufacture of small portable steam engines, diesel engines or domestic goods; notable firms included Ransomes, Sims and Jefferies of Ipswich, Peter Brotherhoods of Peterborough, Richard Garrett of Leiston and Bentalls at Heybridge. Major factories constructing steam engines for road and rail were at King's Lynn (Dodmans and Savage's) and Thetford (Charles Burrell, now a museum). Site survival is generally poor, many including Bentalls and Ransomes have largely been demolished (though part of Ransomes 20th-century Waterside Works is used for warehousing) and those that survive merit detailed investigation.

Fishing, oyster farming and boat building
An important, but much neglected and poorly studied industry in East Anglia. Many of the coastal towns had fishing fleets with associated harbours, trans-shipment sheds, sail lofts and boat repair yards. Herring were landed at Yarmouth, shellfish are caught from North Norfolk and Essex, and the oyster industry flourished in Essex. The latter is currently being investigated using aerial photography, but more information is needed on the degree of survival elsewhere. There are also many abandoned boats associated with these activities around the extensive creek systems. Their condition is deteriorating and they merit further study.

Drainage
The drainage of coastal areas in Norfolk, Suffolk and Essex was first instigated by the Romans. In the mid-17th century Dutch engineers began major schemes of reclamation using windmills (smock and tower mills) in conjunction with drainage channels and in some areas this practice continued into the 20th century. Windmills were gradually replaced from the 1820s, by steam powered drainage pumps. The use of oil engines became widespread at the end of the 19th century and these were superseded in the early 20th century by automatic electrical pumps.

Several windmills that were used for pumping have been renovated, others survive as empty shells, but in most instances only the mill mound remains; a similar pattern of survival exists for steam pumping engine houses. Many of those that were originally erected for diesel engines have been converted to electrical power.

Darby (1940) and Hinde (1974) describe the draining of the Fens and the use of steam power; the application of wind-driven pumps on the Norfolk Marshes is covered by Smith (1978).

Explosives manufacture and military testing
Essex was a major centre of the late 19th/early 20th-century explosives industry and several sites including Bramble Island and Pitsea Hall Farm have important surviving remains. The Royal Gunpowder Mills, Waltham Abbey, Essex has been described by English Heritage as the most important site for the manufacture of explosives in Europe. Gunpowder production began in 1660 and this was replaced in the late 19th century by chemically based materials including guncotton and nitro-glycerine. Explosive manufacture ceased in 1945 and the site was then used as a government research establishment for the testing of rockets and other propellants. Following a detailed survey by the RCHME (1994b), a large part of North Site has been afforded statutory protection. Cocroft (forthcoming) will be the definitive work on the subject.

The emergence of the cold war during the 1950s and 1960s led to various explosive, missile and nuclear test programmes taking place within the region; major sites include Orfordness and Foulness.

Public Utilities
This category includes several disparate industries whose importance has increased considerably during the late

19th and early 20th centuries. Growing concerns over public health led to the provision especially in towns of a clean water supply; water storage towers being the most visible landscape feature. Predominantly built of brick, many of the Victorian examples are architecturally elaborate and are either listed (normally grade II) or form part of a Conservation Area. Steam powered pumping engines were used to draw water from the ground and several important examples have been protected. Much less however, is known about the history of water purification and sewage treatment plants. A Step I Report on the water industry has been prepared as part of the Monuments Protection Programme by English Heritage (see Stocker (1995) for a detailed description of English Heritage's approach to industrial archaeology within the Monuments Protection Programme), but more basic fieldwork needs to be undertaken if a representative sample of the surviving monuments in East Anglia are to be considered for statutory protection.

The provision of town gas was another major mid-19th/early 20th-century industry. Every town and many villages would have been served by a gas works, the gas being produced in retorts. The gas works at Fakenham and Lavenham have both been scheduled as ancient monuments but few other surviving sites have been identified.

Electricity dominates late 20th-century society, but surprisingly little work has been done on the typological and architectural evolution of the industry. Alderton and Booker (1980, 21) identify three power stations of different ages at Peterborough as being especially interesting and recent work by the RCHME as part of the Thames Gateway Project has included surveys of the Tilbury A and West Thurrock power stations (RCHME 1994c; 1995). The industry has also been examined as part of the Monuments Protection Programme and English Heritage will shortly be deciding which sites merit statutory protection.

In recent years the oil industry has had dramatic impact on the landscape of southern Essex. Terminals were erected at Thurrock and Canvey Island; the latter was never completed and may shortly be demolished.

Existing State of Knowledge and Research

For many years most of the pioneering work within this field has been undertaken by individuals and local amateur groups; these include the industrial archaeology (IA) societies for Suffolk, Norfolk and Cambridgeshire. Attempts to create a similar body in Essex have unfortunately failed, but John Boyes and John Booker are the leading county experts. Representatives from the IA societies report on current initiatives, casework and threatened sites to the CBA East Midlands and Eastern England Industrial Archaeology Panel and the CBA East Anglian Industrial Archaeology Panel. The Historic Farm Buildings Group has undertaken research on surviving farm buildings within the region and the Centre of East Anglian Studies at the University of East Anglia maintains the archive of the Norfolk Farm Buildings Survey. Various other disparate groups have been examining railways, canals, and wind and watermills.

The county council Archaeological Sections have only recently become involved in the recording and curation of the archaeological remains from the past 200 years and this reflects the arbitrary separation between below ground archaeology and historic building conservation. Fortunately, this division is beginning to break down as the counties move towards integrated databases for the management of historic buildings and archaeological sites; coverage for the modern period however, remains variable. In all counties stronger links between the Archaeology and Historic Buildings Sections should be developed.

A recent survey undertaken as part of the Association for Industrial Archaeology's Index Record of Industrial Sites and Monuments gives the following figures for the five counties.

SMR region	*Total no. of records held on SMR*	*Total no. of industrial period records on SMR*	*% of SMR records of industrial period*
Cambridgeshire	14800	46	0.3%
Essex	*c.* 14000	*c.* 532	3.8%
Hertfordshire	*c.* 7200	*c.* 1400	19.4%
Norfolk	31746	*c.* 2000	6.3%
Suffolk	16300	*c.* 1000	6.1%

Industrial archaeology is poorly covered within the Cambridgeshire Sites and Monuments Record. The Archaeology Section hopes to undertake an enhancement program (funding permitting) in due course and as a first stage a strategy document will be produced.

The Archaeology Advisory Group of Essex County Council have produced a strategy document for the industrial heritage of the county (Gould 1995). Current initiatives include adding the old CBA industrial archaeology cards compiled by John Booker between 1969 and 1971 to the SMR and information from the Ordnance Survey 1st Edition six inch series is also being mapped. Thematic surveys have been and are being undertaken for the malt and lime industries, and increasingly sites are also investigated/recorded as part of the development control process.

A major survey of the industrial archaeology of Hertfordshire has recently been completed by the Archaeology Section of Hertfordshire County Council and the RCHME. Based on initial work undertaken by William Branch Johnson in the early/mid 1960s, the survey aimed to rapidly input data and assess rates of attrition. Where possible sites were visited by the surveyor, (95% in practice, although internal access was rare); modern 20th-century industry however, remains problematic. Several sites have already been recorded/ investigated as part of the development control process and it is hoped that these will increase. Hertfordshire does not have a county industrial archaeology society, but there is a group in Watford and members of the Greater London Industrial Archaeology Society have also offered expert advice.

Industrial Archaeology and 18th/19th-century farm buildings are well covered on the Sites and Monuments Record for Norfolk. The county has very strong links with the Norfolk Industrial Archaeology Society who have undertaken surveys of iron foundries, lime working, brick making, malting and brewing. In addition the society responds to requests from the various councils, local and county, to report on sites threatened by the planning process. There is still, however a reluctance at county level to attach recording conditions to 18th/20th-century sites affected by development.

Industrial sites and buildings are poorly represented on the Suffolk Sites and Monuments Record. The Suffolk Industrial Archaeology Society are asked to comment on

the potential importance of sites threatened by development, but in recent years there has been little input into the SMR.

For most counties the lack of basic information and specialist knowledge remains a major problem for the modern period. This is further compounded by the existing information being held in several disparate and unrelated locations. Allied to these problems is the total absence of any theoretical agenda. Industrial period monuments form part of a broader social landscape that encompasses housing, religious sites, shops, and buildings and spaces associated with leisure activities. If culture is a determinant of architecture then these buildings reflect the dynamic attributes and values of the society that erected them, and if these concepts fail to be grasped then an important and irreplaceable element of that past is being thoughtlessly destroyed.

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J Marshall
E Martin
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