*An agro-social revolution in a Mid Anglo-Saxon village: making sense of the Sedgeford excavations*

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Abstract

The 25-year field research project at Sedgeford in Norfolk has revealed a radical transformation of settlement and land-use during 'the long 8th century'. We see a large Christian-style inhumation cemetery, a regular grid-planned village, a high-status enclosure, wholesale remodelling of waterways to provide power and transport, and industrial-scale grain processing in a multi-unit malting complex. All these features appear *de novo* in the landscape, and the village, waterways, and malting complex seem to be broadly contemporary and to represent a single, integrated 'big bang' event. The implications are specialisation, mass production, and, very likely, large open fields worked by heavy ploughs. Connectivity is suggested by the remodelled waterways, Sedgeford's proximity to the sea, and the exceptionally large quantities of Ipswich Ware pottery found on the site.

How is this transformation to be understood? We can assume some sort of lordship, and perhaps Sedgeford's subsumption within a 'great estate', to provide the political direction and organisational framework for these changes. We can also assume that expertise was imported – the grid-planned village was carefully surveyed, the remodelled waterways were major works of hydraulic engineering, the malting technology was almost certainly based on continental examples; and we can assume that the Church is likely to have been the source of this expertise. These developments imply a social order in which obligations of labour service and food render were imposed on the peasantry, and in which a distinctive 'anthropology of power' based on elite control over food-flows emerged.

Introduction

The term 'revolution' is overworked. Any concept is liable to break down, to become epistemologically useless, if deployed without due regard for scientific precision. And unlike the 'natural' sciences, where scientific precision is *de rigueur*, the 'social' sciences are plagued by a cavalier attitude to terminology and definition. So I am obliged to substantiate my use of the term 'agro-social revolution' in relation to developments in Sedgeford during the long 8th century, as revealed during our 25 years of excavation on a summer research and training project.

An agricultural revolution is necessarily a social revolution, since it involves the reconfiguring of the labour process, and therefore the reorganisation of the labour force, in line with new technologies and practices in the working of the land. I am using the term 'revolution' to reference the combined 'agro-social' transformation which I believe to be implicit in the archaeological evidence we have uncovered. I am hypothesising that the lives of the people of Sedgeford in AD 850 were radically different from those of their forebears in AD 650. Broadly, I imagine a shift from scattered small communities of more-or-less independent subsistence farmers to a centralised village community of dependent peasants whose lives were shaped by lordship, labour service, and food render. Moreover, I see the main events of the transformation concentrated in a relatively short period, perhaps *c.* AD 725/750-

800/825, that is, playing out over perhaps three generations, and there seems to be nothing as radically transformative as this in Sedgeford again until the 18th century. We seem to bear witness, then, during the long 8th century, to the creation of a class of agrarian producers subject to the authority of a class of landowners; in other words, the class structure of the medieval/feudal countryside appears to have been forged in the Mid Anglo-Saxon period. That, surely, was a revolutionary transformation.

I present the evidence in the form of a summary list of observations and speculations arising from 25 years of fieldwork. Full publication of much of this is to be found elsewhere or is still in process. My recent joint paper with Eleanor Blakelock is one example of this,[1] and that of my colleague Hannah Caroe in this volume is another. This chapter, on the other hand, is a synthetic overview that brings together a diverse range of evidence to substantiate our core working hypothesis: that Sedgeford experienced an agro-social revolution during the long 8th century.

## The geography and chronology of the project

Sedgeford is located on the low Western Escarpment that runs north-south along the western edge of Norfolk. This rolling landscape is a complex of chalk bedrock, carstone outcrops (a locally important sandstone), and overlays of fluvio-glacially deposited sands, gravels, loams, and boulder clays. This geology is dissected by a series of small westward-flowing rivers that have cut the region into a succession of little valleys. The typical pattern today is for each valley to constitute a parish and to have its own village. Sedgeford is typical in this respect.

Building on a handful of antiquarian records, significant but unpublished research excavations in 1957, 1958, and 1960, and a small commercial investigation during pipe-laying in 1993, the Sedgeford Historical and Archaeological Research Project (SHARP) was set up in 1996 as a long-term, self-funded, volunteer-based research and training excavation. Since then, each year, the project has usually involved a six-week summer season (with up to 75 people on site each day), a short Easter season for fieldwalking, metal-detecting, geophysical survey, etc (involving a dozen or so people), and an ongoing programme of archive research, post-excavation analysis, and publication.

Our study area is the present-day parish of Sedgeford (and the term ‘parish’ is used below even in relation to the Mid Anglo-Saxon period as a convenient geographical shorthand). Our investigations have been thoroughly multi-disciplinary, involving, in addition to the main Mid Anglo-Saxon excavations, archive research, landscape exploration, geophysical survey, standing-building recording, garden test-pits, small evaluations, and medium-size open-area excavations; investigations that have yielded evidence in particular for the Late Iron Age, Roman, and later medieval archaeology of the parish. But throughout, a large Mid Anglo-Saxon site in the centre of the parish, on the southern side of the Heacham valley, immediately opposite the modern village of Sedgeford, has been the primary focus. Work here has fallen into three distinct phases.

Between 1996 and 2007, we explored a Mid Anglo-Saxon cemetery on the Boneyard-Reeddam site, taking a sample of 291 inhumations, in the course of which we also observed several phases of boundary ditches and various structures. Between 2007 and 2016, our attention shifted a short distance to the south – higher up the southern slope of the valley of the River Heacham – where geophysical survey had

[1] Faulkner and Blakelock 2020.

revealed evidence for a settlement, confirmed by fieldwalking finds to be Mid to Late Anglo-Saxon in date, in the neighbouring Chalkpit Field.[2] And since 2014 (and still continuing), we have been exploring a third zone, a cereal-processing plant located a short distance south-east of the settlement in a shallow gully towards the eastern side of Chalkpit Field (Trench 23). This third phase of excavation has been supplemented by historical and landscape work, including archive research, geophysical survey, auger survey, and trial trenching, designed to contextualise the exceptional discovery of a Mid Anglo-Saxon industrial complex comprising at least three and possibly more individual malthouses.[3]

## A Mid Anglo-Saxon 'shuffle'

The notion of a Mid Anglo-Saxon 'shuffle' – a localised shift from many, small, dispersed settlements to single consolidated villages in new, typically valley-floor locations – has long been part of the conceptual architecture of Anglo-Saxon settlement studies.[4] This was confirmed to be the case at Sedgeford early in the SHARP excavations. Though no Early Anglo-Saxon site has been properly excavated in the parish, we have recent metal-detector evidence for one substantial cemetery of late 5th to early 7th century date (with both cremations and inhumations, and some richly furnished graves), and antiquarian evidence for at least one and possibly two or three other cemetery sites (represented by accidental discoveries of funerary urns during the 19th and early 20th centuries).

On the other hand, no evidence of any kind for Early Anglo-Saxon activity has been recovered during our three open-area research excavations on the Mid Anglo-Saxon site in the middle of the parish. Despite encountering a Late Neolithic/Early Bronze Age crouched burial, a Middle Iron Age crouched burial, a Late Iron Age water's edge ritual site notable for the discovery of the Sedgeford Hoard (39 gold staters, 20 of them still inside their cow-bone container), the evidence for activity between the 1st century AD and the 7th century AD has been virtually zero, except for a 'background noise' of occasional degraded Roman pottery, presumably representing midden spreads and subsequent hillwash.[5]

We are confident that: a) Early Anglo-Saxon settlements existed in the parish (on the basis of the cemetery evidence); b) no such settlement was located beneath the Mid Anglo-Saxon one; and c) that the Mid Anglo-Saxon settlement therefore appeared *de novo*, probably at some point in the second half of the 7th century AD.

## A Mid Anglo-Saxon village and cemetery

Little is known about the new village in its earliest form (Phase 3).[6] We know of a ditched trackway/droveway running south-east to north-west on the Lower Chalkpit settlement site, the ditches re-cut at least three times, the features dated by local,

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[2] The first two phases of work are summarised in our in synthetic monograph, *Digging Sedgeford: a people's archaeology*, published in 2014.

[3] A full description of Malthouse 1 can be found in Faulkner and Blakelock 2020. A summary description of our current knowledge of the wider malting complex can be found in Blakelock forthcoming (in 2021).

[4] E.g. Williamson 1993, 89-91.

[5] The SHARP Team 2014.

[6] Phases 1 and 2 on the site are Late Iron Age and Early Roman respectively. There is then a long hiatus, perhaps as long as half a millennium, before Phase 3, dated *c.* AD 650/700-725. The principal Late Iron Age discoveries are reported in Dennis and Faulkner 2005.

handmade, grass-tempered pottery, which presumably pushes the date earlier than c. AD 725, when the first Ipswich Ware is likely to have arrived at Sedgeford. This trackway/droveway was broadly contemporary with two parallel north-south ditches on the Boneyard-Reeddam cemetery site, though we cannot be certain that burials were yet being made.

Matters become a good deal clearer in Phase 4 (*c.* AD 725-?775/825). We now have a substantial curvilinear boundary ditch on Lower Chalkpit, at least 100 metres long on the evidence of geophysical survey, with a second ditch, almost as long, aligned south-west to north-east, meeting it at right-angles in the vicinity of an apparent entranceway. Just inside the entranceway were found the remains of a structure, formed of 20 postholes representing three sides of a rough rectangle, with a putative fourth side lost to a later ditch. A structured deposit comprising an articulated calf skeleton covered by a layer of unprocessed mussel shells was found at the northern limit of the curvilinear ditch. There seems little doubt that these features are evidence for the first incarnation of the Mid Anglo-Saxon settlement.

Of greater significance, however, is the associated cemetery on Boneyard-Reeddam. We cannot be certain it was extant as early as Phase 3, but it was certainly in use throughout Phases 4 and 5 (so can be dated *c.* AD 650/725-850/875), a date based on stratigraphic sequence, associated pottery, and several radiocarbon determinations. Our excavations (1996-2007) recovered 291 discrete inhumations, we know of a further 126 excavated in 1957, 1958, and 1960, and we have also recovered a large assemblage of disarticulated bone representing burials disturbed by later feature-cutting and modern ploughing on the site. Extrapolating from the density of burials in the areas sampled by excavation and what we know about the likely limits of the cemetery, we can estimate a total of between 800 and 1600 burials in all. The burials were aligned east-west, some bodies in coffins, most in shrouds, and there were no associated grave-goods.[7] The implication, of course, is a cemetery managed by Christian ecclesiastical authority, an impression perhaps confirmed by a small posthole structure respected by the burials and assumed to be some sort of funerary chapel.

What matters for the argument here is that the cemetery implies not only an organising authority, but also a pooling of labour and therefore of resources. If we make a number of working assumptions – about the size of the cemetery (1200 burials), its duration of use (175 years), and average life-expectancy (45 years) – we arrive at a rough estimate of the living population at the time. Because of the unknowns and uncertainties, the calculation is crude, but it does provide a ballpark figure of around 300. This turns out to correspond closely with the estimated population of Sedgeford in the late 11$^{th}$ century (based on the *Domesday* survey), which is 277-338. We might suggest, therefore, that by the early 8$^{th}$ century AD, a community of about 300 people had been brought together under some sort of centralising authority.

## A grid-planned landscape

Phase 5 (*c.* AD ?775/825-850/925) saw radical change. The curvilinear boundary around the settlement on Lower Chalkpit was replaced by a new rectangular grid oriented approximately north-south/east-west, with individual plots defined by ditches

[7] There were only two significant anomalies, perhaps suggestive of 'Final Phase' pagan practice, one a horse burial, the other a small pit containing a pot, a couple of knives, and some smithing slag. See The SHARP Team 2014, 92-3.

measuring approximately 30 by 25 metres, and individual buildings, aligned with the boundaries, measuring approximately 10 by 5 metres. The settlement retained this basic form for up to 200 years, throughout Phases 6 (*c.* AD 850/925-?900/950) and 7 (*c.* AD ?900/950-?975/1025), both dated by Thetford Ware. Boundaries were repeatedly re-cut, buildings periodically replaced, and during Phase 7 a large D-shaped enclosure was established on the southern edge of the village, interpreted as a thegnly residence given the monumental size of the boundary ditch and the substantial interior features seen in excavation.

The new gridded layout, moreover, appears to employ the short-perch measure (4.6 metres) identified by John Blair, Stephen Rippon, and Christopher Smart as a standard unit in Mid Anglo-Saxon planning.[8] SHARP landscape archaeologist David Wood found that a short-perch grid overlain at an angle of 115°T on a composite of Google Earth satellite images, magnetometry survey results, and a plan of excavated features corresponded with the alignments of a medieval trackway still in use and the northern boundary of the D-shaped enclosure, and also with the alignments and measurements of various individual plot boundaries. Furthermore, the buildings excavated within the plots also displayed regularity: with one notable exception, more substantially built and oriented east-west (a church?), the buildings were oriented north-south and measured approximately one short-perch by two short-perches.

The grid was then extended to the wider landscape, with a short-perch furlong (184 metres) as the unit of measurement, but retaining the 115°T orientation derived from the settlement evidence. This hypothetical Mid Anglo-Saxon grid showed remarkable correspondence with existing field-boundaries (accounting for nearly 40% of them), and also with lost field-boundaries recorded on a 1631 estate map, on the 1880 first edition OS map, and in magnetometry surveys (adding half as many again matching lines). Additional support for the working hypothesis of a planned Mid Anglo-Saxon estate centred on Sedgeford arises when the view is extended further, to neighbouring parishes, where quite different alignments of field-boundaries are apparent.[9]

The implications are numerous. The circumstantial evidence that the Church was the repository and disseminator of essentially Roman techniques of surveying is compelling.[10] The need for some sort of overarching authority, whether secular or ecclesiastical, to organise this level of landscape planning seems obvious. The preoccupation with standard measurements, straight lines, and right angles – that is with a symmetrical reconfiguring of the landscape – implies a wider concern with order and control. The deliberate demarcation of plot boundaries betokens a community concerned to define individual rights and obligations.[11]

## Water power and water transport

Broadly contemporary with the grid-planning of the village and the presumed associated estate landscape was a wholesale remodelling of the water system in the parish. The River Heacham rises at Bircham Newton in the low chalk hills of north-west Norfolk and runs for about 10 miles via Fring, Sedgeford, Eaton, and Heacham

[8] Blair, Rippon, and Smart 2020.
[9] Work is still in progress and will in due course be the subject of a separate paper. A notable feature of this work is the use of a 3D digital terrain model, as opposed to reliance on 2D conventional mapping, since Mid Anglo-Saxon surveyors will have worked ‘as the pheasant walks’ not ‘as the crow flies’.
[10] See Blair, Rippon, and Smart 2020, 87-154, for a detailed argument.
[11] A notion explored at length in Reynolds 2003.

to the Wash. Fed by numerous springs along its route, the flow was stronger in medieval times, and the river was navigable at least between Fring and the sea.

We know of three major developments in the medieval period in relation to this waterway. Firstly, the river itself was canalised, managed, and maintained so as to power a number of water-mills. The *Domesday* survey recorded a mill at Fring, four at Sedgeford, and three at Heacham. Our investigations, involving both archive research and field reconnaissance along the line of the river, have identified six possible mill sites within the Sedgeford parish boundary. We have also recovered fragments of both basalt lava stone from the Eifel region of north-west Germany and grit stone from the Dark Peak area of north Derbyshire.

Secondly, a 16-acre wetland immediately south of the current river-line in Sedgeford, know as 'the Reeddam', appears to have a Mid Anglo-Saxon origin. Though the earliest historical references go back only to the 13th century, when the Reeddam was described as a fish-pond and reed-bed, a series of separate archaeological interventions, mainly a mix of auguring and trial-trenching carried out by SHARP since 1996, have provided a relatively well-dated stratigraphic sequence. Of decisive significance are two layers of homogeneous white/grey chalky clay without inclusions, almost certainly representing deliberate deposition. The upper layer seals a deposit rich in occupation debris dated by Ipswich Ware; crucially, despite the abundance of Thetford Ware across the settlement and cemetery site immediately to the south, and the relatively large ceramic assemblage recovered from the Reeddam, *no Late Anglo-Saxon pottery has been found beneath the upper chalky clay*. Our working assumption, therefore, is that this layer represents a deliberate relining of the Reeddam in the Mid Anglo-Saxon period.

Thirdly, running along the southern edge of the Reeddam, but extending much further to the west – it has been traced for more than five miles – is a U-shaped canal measuring 6 metres in width and 1.5 metres in depth down to its chalky-clay base. We have not been able to date this feature with confidence. It may be cut into chalk bedrock in places, and it appears to have been repeatedly dredged in the later medieval period, with no less than 14 re-cuts observed in one excavated section. Nonetheless, we strongly suspect that the canal was in use in the 8th century AD – part of a wholesale refurbishment of Roman-period features.[12]

The reasoning is as follows. Between the lower and upper chalky-clay layers in Reeddam, we seem to have a mix of Romano-British pottery at the lower level and Ipswich Ware at the upper level, with the strong implication that that lower chalky-clay was a Roman deposit, the upper chalky-clay a Mid Anglo-Saxon one. We can therefore speculate that the putative Mid Anglo-Saxon authority responsible for the grid-planned remodelling of village and estate was also responsible for restoring an old water-management system designed for power, transport, and wetland resources. The river would have provided power for the water-mills. The Reeddam would have functioned as a mill-pond, a reserve power-supply, and a source of fish, fowl, and reeds. The canal would have facilitated rapid transhipment of bulk goods in barges, unimpeded by the workings of the water-mills on the river. This interpretation must be tested by further investigations, but it provides a strong working hypothesis.

## Monoculture and industrialised food processing

[12] See Blair 2007 for evidence for Anglo-Saxon canal-building in general and re-use of Roman facilities in particular.

Our assumption of water-mills and barge-transports in the 8th century is driven in part by the evidence for specialised production and mass processing of grain represented by our Mid Anglo-Saxon malting complex. This is discussed in detail in my colleague Hannah Caroe's chapter in this volume, so I offer here only a quick summary and one or two wider interpretive remarks.

The excavation of Trench 23 is ongoing, but much is already clear. The malting complex is located in a small but steep-sided gully about a minute's walk to the south-east of the Mid Anglo-Saxon village. The gully, lying towards the base of a long, gentle slope with a loose, sandy topsoil, is subject to rapid infilling. This is responsible for the exceptional preservation of the Mid Anglo-Saxon levels, which comprise a relict Mid Anglo-Saxon ploughsoil (see below) overlying and sealing a Mid Anglo-Saxon malting complex whose remains include floor surfaces, collapsed walls, burnt-clay structures, and traces of carbonised wood.

This entire sequence is dated by pottery and C14 determinations. Despite the abundance of (later Anglo-Saxon) Thetford Ware on the nearby settlement site, and the presence of abraded (later medieval) Grimston Ware in the upper ploughsoil on Chalkpit Field, both classes of material are *entirely absent* from the sealed lower ploughsoil in Trench 23, which lies buried under deep accumulations of orange, sandy, relatively sterile colluvium. This lower ploughsoil contains an abundance of midden material – animal bone and oyster shell – and is dated by relatively large quantities of Ipswich Ware, which is the only pottery present except for occasional small abraded sherds of residual Iron Age and Roman wares. The ploughsoil provides a *terminus ante quem* for the underlying malting complex. This, however, is also dated by small quantities of associated Ipswich Ware and by three C14 determinations derived from burnt-grain samples. Allowing the Ipswich Ware to provide both a *terminus post quem* of *c.*725 and a *terminus ante quem* of c.850, the calibrated C14 dates can be modelled to give the following approximations: 748-770 @ 68.3%, 734-775 @ 68.3%, and 772-819 @ 68.3%.[13] Also relevant here is that the dates obtained from the burnt-grain samples probably relate to terminal fires, that is, to the destruction of the malthouse in question, not its construction. This pushes our hypothetical date for the establishment of the first malthouse on the site even earlier. The evidence therefore implies that the malting complex predated somewhat the grid-planning of the village (dated *c.* AD ?775/825). Nonetheless, it could still be regarded as part of the same associated 'package' of changes – our hypothetical big bang – since we assume these to have rolled out over three generations, from, say, *c.* AD 725/750 to 800/825.

What the C14 determinations also suggest is that Kilns 1 and 2 may have been broadly contemporary, while Kiln 3 may have been somewhat later; and that the entire malting operation probably did not continue for more than about 85 years altogether.[14] This brings us to the nature of complex itself. This comprises at least three, probably four, and perhaps more separate malthouses. The best understood is Malthouse 1, which comprises the three key elements of steeping area/tank, germination floor, and drying kiln.[15] Malthouse 2 lies immediately to the north, but seemingly on an east-west alignment, rather than north-south along the length of the gully like Malthouse 1; in this case, moreover, only the kiln and the germination floor have been identified. Malthouse 3 is similar: it lies immediately north of Malthouse 2, is aligned east-west, and so far has yielded no evidence for a steeping area/tank.[16]

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[13] Mark McKerracher, FeedSax, pers. comm.
[14] *Ibid.*
[15] See Faulkner and Blakelock 2020.
[16] See Caroe this volume for more detailed discussion of the evidence from Malthouses 1, 2, and 3.

Malthouse 4 – if such it is – lies at the opposite, southern end of Trench 23, and little is yet known of it, for it is still at an early stage of excavation. Since, in places, the remains of the malting complex extend beyond the limits of excavation, it is possible that further malthouses lie hidden.

The apparent anomaly of missing steeping areas/tanks may be easily explicable. Malthouse 1's steeping tank was placed in a deep hollow, but this would not have been necessary to its operation. Traditional malthouses place their steeping tanks at ground-level. It is possible that we may yet find ephemeral evidence for this in Trench 23; or it may be that, in these circumstances, no traces of any kind will survive. On the other hand, to further complicate the picture, there is some evidence that Malthouse 4 may in fact include a hollow comparable with that excavated in Malthouse 1. We will see. Suffice to say, we have absolute confidence that we are observing three and possibly four separate malthouses, all of similar dimensions, placed side-by-side in the gully. This layout need not, of course, indicate contemporaneous use; it may represent a process of replacement, the new being built while the old was still in operation. At this stage, we do not know.

Also worth mention is the spring and stream (visible on geophysical survey plots) which supplied water to the malting facility. The stream was canalised into two channels which ran either side of the malthouses, and, given the box-shaped cross-sections revealed in excavation, we can be pretty certain these were wood-lined. The malting process required large quantities of water for steeping (with regular changes of water recommended), while at the same time the stream flow needed to be diverted around the actual malthouses.

There are two critical points to be made about the malting complex relevant to the theme of this chapter: they concern scale and know-how. Estimates of grain-processing capacity involve a series of assumptions and estimates. But on the basis of what we know about a) traditional malting practices, b) the size of our germination floors, and b) medieval crop yields at Sedgeford, we calculate that, if Malthouse 1 had been in operation for a full eight-month malting season (October to May), it could have processed the product of approximately 45 acres. We can further calculate that processing this quantity of grain might have yielded approximately 28 tonnes of malt, representing around 1,500 barrels or 400,000 pints of full-strength ale – or as much as double that quantity if the main brew was a low-alcohol 'small beer'. To give that some context, average per capita beer consumption in Britain today stands at around 150 pints per year. We might suggest, therefore – continuing to round our figures into handy ballpark estimates – that Malthouse 1 might have been capable of producing sufficient malt to supply a population of between 2,500 and 5,000 people.[17] Needless to say, if more than one malthouse was operational at any one time, these estimates would need to be multiplied accordingly.

Then there is a question about the technical know-how embodied in the malthouses. As with other aspects of our big bang – the measured survey grid, the regularities in the dimensions of buildings, the creation of the millpond, the refurbishment of the canal, the probable construction of watermills – a skilled organising authority seems implicit. The malthouses, like everything else associated with the Mid Anglo-Saxon settlement at Sedgeford, appeared *de novo* in the landscape. Indeed, when we look further afield, to the Anglo-Saxon evidence as a whole, among 25 separate grain-dryers known at nine different sites, not a single one seems to date earlier than the late

[17] I am indebted to Jake Lambert of Crisp Malt for relevant figures for traditional malting and to John Jolleys of SHARP for archive evidence of medieval crop yields.

7th century AD.[18] We have, therefore, a hiatus of about 250 years between the latest Romano-British grain-driers and the earliest Anglo-Saxon ones. I have not had time to research the European evidence. I do not know whether we have dated examples of grain-dryers for this period in the European archaeological corpus. Nonetheless, a reasonable working hypothesis must be that the technologies of mass processing of foodstuffs – in contrast to the relatively low-tech methods of Early Anglo-Saxon subsistence farmers – are likely to have been transmitted from the Roman period to the Carolingian/Mid Anglo-Saxon period by the Christian Church. Regardless of whether the organising authority for Sedgeford's transformation was secular or ecclesiastical, it seems highly likely that the expertise of internationally-networked clerics was called upon.[19]

## Heavy ploughs and open fields

Nucleated villages facilitate pooling of labour and resources. Most important, perhaps, was the pooling necessary to provide and operate heavy ploughs. By 'heavy plough' I mean a more substantially constructed plough designed to hold a coulter (for cutting the sod), a share (for tearing the sod), and a mouldboard (for turning the sod over on itself). Because such a plough was designed to dig deep and throw the sod – as opposed to merely 'scratching' the surface – it required strong animal traction, ideally at least two oxen, but possible four, six, even eight, depending on the soil. The *Domesday* survey, when the population of Sedgeford was around 300, gives five as the number of plough-teams. If we assume two oxen per plough, each of these might have ploughed an acre or more a day, especially given Sedgeford's relatively light soils, and perhaps between 60 and 120 acres per season.[20] Moreover, for maximum efficacy, heavy ploughs required a throwing down of boundaries and the creation of large open fields, because an ox-drawn plough is slow to turn and involves a wide turning-circle. From these observations we gain a sense of the investment of equipment, animal-power, and human labour, and the likely reorganisation of field systems, implicit in the kind of agricultural intensification we are envisaging. By contrast, it is difficult to imagine a viable monoculture being based on the scratch ploughs and small fields of subsistence farmers.

Nonetheless, our evidence of the use of heavy ploughs and the creation of open fields is suggestive rather than definitive. It comprises seven distinct observations regarding the Mid Anglo-Saxon ploughsoil deposit overlying the remains of the malting complex in Trench 23. They are as follows: 1) the presence of numerous north-south plough marks on the underlying malting-complex features, and the complete absence of crosswise east-west marks; 2) the depth of this scoring, sometimes cutting deeply into hard burnt-clay features; 3) the depth of the ploughsoil deposit; 4) the poorly sorted nature of the deposit, with distinct 'clod-like' mottling of lighter brown and darker grey soil; 5) the suggestion in places (no more than that) of diagonal layering of these 'clods', as if thrown by the last ploughing; 6) an abundance of apparently 'ploughed-in' midden material in the matrix, with much bone, shell, and pot distributed fairly evenly through the deposit; and 7) the identification of stinking mayweed in archaeo-environmental samples taken from the ploughsoil, a weed associated with deep ploughing.[21]

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[18] The evidence is summarised in Table 1, pp88-9, in Faulkner and Blakelock 2020.
[19] See also Blair, Rippon, and Smart 2020 for the likely role of clerics in measured landscape survey.
[20] Banham and Faith 2014, p54.
[21] I am grateful to Hannah Caroe, SHARP environmentalist, for the last observation.

## Connectivity

Mid Anglo-Saxon Sedgeford is likely to have been producing far more malt than could have been brewed into ale and consumed in the village; industrial-scale malting implies connection with a wider economic network. The remodelling of the local river system as a transport highway down to the sea is one indication of that. Another is our Ipswich Ware assemblage.

This material is so familiar – so ubiquitous and diagnostic on East Anglian sites – that it is occasionally useful to remind ourselves how remarkable it is. All of it was made in Ipswich, where manufacture was on an industrial scale. In form and fabric it was highly standardised, comprising about 95% jars of various sizes, otherwise mainly pitchers. It was virtually the only pottery used in East Anglia between *c.* AD 725 and 850, and, though some Ipswich Ware pots were transported further afield, its concentrated and more-or-less exclusive distribution within East Anglia can reasonably be taken to define the extent of the 8th century Anglo-Saxon kingdom.[22] That said, the distribution within East Anglia is highly skewed. Sedgeford has produced one sherd for every 2.2sqm excavated, for example, whereas North Elmham produced only one sherd per 75sqm.[23] All of this points to a politically-controlled distribution mechanism; nothing points to any sort of 'free market' system. Nor, given the unadorned, somewhat lumpy, obviously functional character of the pots, can we assume that they were being moved around for their own sake. They must have been ceramic containers (or *ambers*, to use a contemporary term), used to transport relatively low-bulk, high-value produce such as ale, beeswax, butter, dried fruit, honey, lard, mead, preserved fish, preserved meat, salt, spices, tallow, wine, or what have you. Sometimes they might have been returned as 'empties', sometimes they may have been reused at the destination for the export of other produce; but very often, of course, they were simply recycled as domestic storage vessels and cooking pots (as *crocca*, for example), since this is how the great majority of them seem to have entered the archaeological record.

Sedgeford's Ipswich Ware sherd count, now at around 4,500, is one of the highest known. Though the parish lies on the edge of the former Kingdom of East Anglia, and on the opposite side of the territory from Ipswich, it is nonetheless very close to the coast and is served by a navigable river. It seems reasonable to take the abundance of Ipswich Ware in Mid Anglo-Saxon Sedgeford as evidence for its connectivity with a regional system of politically-managed and socially-embedded distribution. I shall have a little more to say about this in the conclusion below.

## Labour services

Brian Fraser, SHARP's site manager and a chartered quantity surveyor, was tasked with estimating the investments of labour-power implicit in the many substantial infrastructure projects either evidenced or implied by what we know about Mid Anglo-Saxon Sedgeford. The results of his work are summarised in the table below.

| **Task** | **Labour** |
|---|---|
| Quarrying of chalk for lining canal and millpond | 8,308 man-days |

[22] Blinkhorn 2012.
[23] Estimates based on our own results and Wade-Martins 1980.

| | |
|---|---|
| Transporting chalk from quarry to construction site | 1,859 man-days |
| Recutting and relining 9km-long canal | 8,915 man-days |
| Dredging and relining 16-acre millpond | 5,574 man-days |
| Constructing Tamworth-type watermill | 241 man-days |
| Constructing Sedgeford-type malthouse | 250 man-days |
| Total | 25,147 man-days |

Table 1: Estimates of man-hours required in various construction works undertaken in Mid Anglo-Saxon Sedgeford.

Our aim here is to provide ourselves with some rough orders of magnitude in assessing the labour demands placed on the inhabitants of Mid Anglo-Saxon Sedgeford. To do this, we make three assumptions: 1) that the workforce would have comprised mainly adult, able-bodied men, so perhaps 100 or so, one third of the estimated population of Sedgeford at the time; 2) that the work was spread across about three generations, so perhaps 75 years in all; and 3) that working days were restricted to 150 days per year, allowing for Sundays, holy days, weddings, funerals, etc, this being a common medieval pattern. This gives us a labour capacity of 7,500 man-years, which translates into 1,125,000 man-days. Even if we assume, as we might, that some men may not have been subject to labour service – the later *Domesday* entry for Sedgeford lists 14 freemen – it is immediately apparent that these tasks would not have represented an unsustainable burden, especially given that they would surely have been fitted into slack periods in the agricultural cycle. The critical matter would have been the existence of an organising authority with effective control over the collective labour of the villagers. The implication, in my view, is the successful establishment of feudal social relations at Sedgeford in the 8th century AD.

## Conclusions

Sedgeford has produced 8th century evidence for: the creation of a nucleated village; centralised control over labour-power; the use of heavy ploughs in open fields; a new gridded layout of plots and fields; mass production and processing of grain; large-scale hydraulic engineering to power mills and facilitate transport; investment in the high-tech plant of watermills and malthouses; integration into some sort of regional distribution network; and an enclosed thegnly residence.

Evidence of this kind is easily misinterpreted. It is open to two kinds of simplistic assumption in particular: that it presents increased production; and that it betokens the development of markets, trade, and proto-capitalism. Neither assumption is implicit in the evidence.

We have no way of knowing how productive independent subsistence farmers in the Early Anglo-Saxon period may have been in comparison with peasant villagers like those at Sedgeford in the Mid Anglo-Saxon period. There is a world of difference between an intensive, mixed, family-based ‘garden plot’ regime and an extensive, specialised, village-based ‘open field’ regime. The former may, in fact, represent a more efficient use of land because of high labour inputs by self-motivated producers. There are countless examples in the historical record of poor land use in the context of feudal-type social relations characterised by forced labour.

As for market-based exchange – with foodstuffs being produced and traded as commodities – there is no evidence whatsoever for this at Sedgeford in the 8th century. The common assumption in so much of the secondary literature that this is what is represented by agricultural specialisation, by coin assemblages, by so-called

'productive sites', and so on, is precisely that, an assumption, and, I would argue, one based on viewing the early medieval world through a modern 'neoliberal' lens and applying wholly inappropriate economic categories to it.

The evidence of Sedgeford's agro-social revolution is best understood as an expression of the rise of lordship, the division of the land into great estates, and the imposition of labour services and food renders on a class of dependent peasant villagers. This, I suggest, gave rise to a tributary economy based on elite control over food surpluses and to an elaborate anthropology centred on food consumption that played out in mead halls, around peasant hearths, and at harvest festivals. The Mid Anglo-Saxon lord – the putative Lord of Sedgeford – was a food mountain and the source of food flows (upwards, downwards, sideways) that created the complex networks of patronage and dependence which bound the newly emerging medieval society together.[24]

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[24] See Faulkner forthcoming 'The political economy of Middle Anglo-Saxon England: a hypothetical model'.

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