

5. INFIELD AND OUTFIELD: THE EARLY STAGES OF MARSHLAND COLONISATION AND THE EVOLUTION OF MEDIEVAL FIELD SYSTEMS

by Stephen Rippon

Introduction: Infields and Outfields

In recent decades we have come a long way in our understanding of medieval field systems, and in particular the origins and structure of the Midland open fields. The work of David Hall in Northamptonshire and elsewhere has been one of the most important contributions, most notably for the way in which documentary, cartographic and earthwork evidence are integrated. Though the structure of these field systems is now relatively well-understood, their origins are less clear. Large-scale fieldwalking has shown that the medieval pattern of nucleated villages and open fields replaced a landscape characterised by dispersed settlement, though little is known of the structure of their associated field systems. There has been speculation that open fields may have evolved from infield-outfield systems (e.g. Astill 1988, 63; Baker and Butlin 1973c, 655-6; Finberg 1969, 150; Fox 1981, 64, 89-90), and though Taylor (1981, 13) is quite right in suggesting that 'systems such as run-rig and infield-outfield ... are well documented as having existed in many places in this country', such arrangements have received relatively little attention in recent overviews of British field systems (Astill 1988; Rowley 1981; Taylor 1987, 68).

Infield-outfield agriculture is a system of cultivating land whereby certain core areas are regularly cropped and manured, with other areas only occasionally cultivated when and as required. It is best known in Scotland though the evidence is in fact relatively late (mainly from the fifteenth century and later [Dixon 1994, 30; Whittington 1973]), and in certain places at least may represent a relatively brief episode which replaced a more enclosed landscape (Dodgshon 1994). Infield-outfield systems are also known elsewhere in the western fringes of the British Isles (Buchanan 1973, 584-98; Jones 1973, 435), though it is less clear whether they were ever widespread in lowland Britain. Documentary and cartographic evidence testifies to the occasional cultivation of outfields during the medieval period from as far afield as Cumberland (Elliott 1973, 42, 54-6), Yorkshire (Harris 1959, 6-7; 1961, 24-5), Staffordshire (Baker and Butlin

1973a, 20), Nottinghamshire (Beresford and St Joseph 1979, 45-6), East Anglia (Bailey 1989; Postgate 1973, 300-3), Kent (Baker 1973, 417), Somerset (SRO DD/CCH bx7/6; Hallam 1978, 44), and Devon (Finberg 1969, 147-8; Hoskins 1954, 63) (and see Uhlig 1961). On the whole, what this documentary evidence describes is the simple practice of dividing land between that which was more or less permanently cultivated and manured – the infield – and areas that were only infrequently manured and cultivated on a temporary basis – the outfield. This is infield-outfield cultivation in principle, but when the location of the infield and outfield areas can be located, the permanently cultivated areas were not necessarily concentrated into a central core area close to the village (e.g. Postgate 1973, 301; Baker 1973, 417). This leads to the question of whether these infield/outfield systems are the last surviving remnants of an approach to landscape exploitation that was once more common, or a relatively late development that simply enabled at least some cultivation of the last remaining areas of poor ground within a township (e.g. Baker and Butlin 1973b, 20; Bailey 1989; Sheppard 1973, 154).

The obvious spatial configuration for an early infield-outfield system in the less crowded landscapes of the early medieval period is for a nucleus of manured arable land around or immediately adjacent to the settlement, with a less intensively used zone further out. Did such idealistic arrangements ever exist in practice? Detailed fieldwalking studies have suggested that such systems existed in the Roman period (e.g. Gaffney and Tingle 1989; Rippon 2000a), and the possibility of medieval infield-outfield cultivation has also been raised through detailed fieldwalking at Wharram Percy. Here heavily manured fields concentrated to the north and west of the village, with a few examples to the east, with areas beyond this core being less intensively manured. This may reflect simply convenience (distance from the village) or some form of infield/outfield cultivation (Hurst 1983, 99), and documentary evidence certainly testifies to the latter on the Yorkshire Wolds (Sheppard 1973, 154).

Field-names might also give clues to the presence of early core agricultural areas. Fox (1981, 89) has suggested that 'old field' and possibly 'longlands'

field-names may indicate an 'original nucleus of arable land' associated with early settlements (and see Ford 1979, 158-61; Sheppard 1973, 179-80; Uhlig 1961, 293). Physical evidence for such arrangements is less common, though careful integration of documentary material with evidence contained within the historic landscape in a number of areas has revealed oval-shaped enclosures that are potential infields (e.g. Lancashire: Atkin 1985; Wheldrake in Yorkshire: Sheppard 1966; Cockfield in Co. Durham: Roberts 1981; around Exmoor: Green 2000; Gillard *et al.* 2000, 7; the Kentish Weald: English 1997). The rest of this paper relates to another area where potentially early core agricultural areas have been identified: the coastal wetlands of the Severn Estuary Levels.

The Early Medieval Colonisation of Coastal Marshes

At first sight, it might seem that coastal wetlands have little to contribute to the debate over the origins of field systems in dryland areas. However, it appears that the reclamation of these areas was going on at the same time as open fields were evolving at the end of the first millennium AD (Rippon 1997a; 2000b): might similar approaches to the cultivation of land have been going on in both areas? Marshland landscapes contain within their fabric a record of how they evolved (e.g. Fig. 1), which is probably more complete than in dryland

areas, where features such as field-boundaries are more expendable: in a marshland landscape even very early boundaries will tend to survive since, once created, ditches would have become an invaluable part of the drainage system. Overall, these marshes provide a model for how early medieval landscapes evolved under relatively controlled circumstances: on a flat surface, with few pre-existing features to constrain subsequent events, and where the need to maintain drainage meant that boundaries, once created, tended to survive.

In recent decades, most of our extensive coastal wetlands have seen programmes of research into their landscape history. A common feature of these studies has been the interdisciplinary nature of that research, integrating geomorphological, palaeo-environmental, archaeological, documentary and cartographic sources. A number of studies have used the fabric of the present – or historic – landscape as a framework around which this other evidence can be woven, notably David Hall's (1996) work in the Cambridgeshire Fens, Hallam's (1965) seminal study of the Lincolnshire fens, Williams' (1970) *Draining of the Somerset Levels*, Silvester's (1988; 1993) work on the Norfolk Marshland, Eddison and her colleagues' research into Romney Marsh (Eddison 1995; Eddison and Green 1988; Eddison *et al.* 1998), and Rippon's (1996a; 1997a) studies of the Severn Estuary Levels. However, in all these cases it is the twelfth and thirteenth

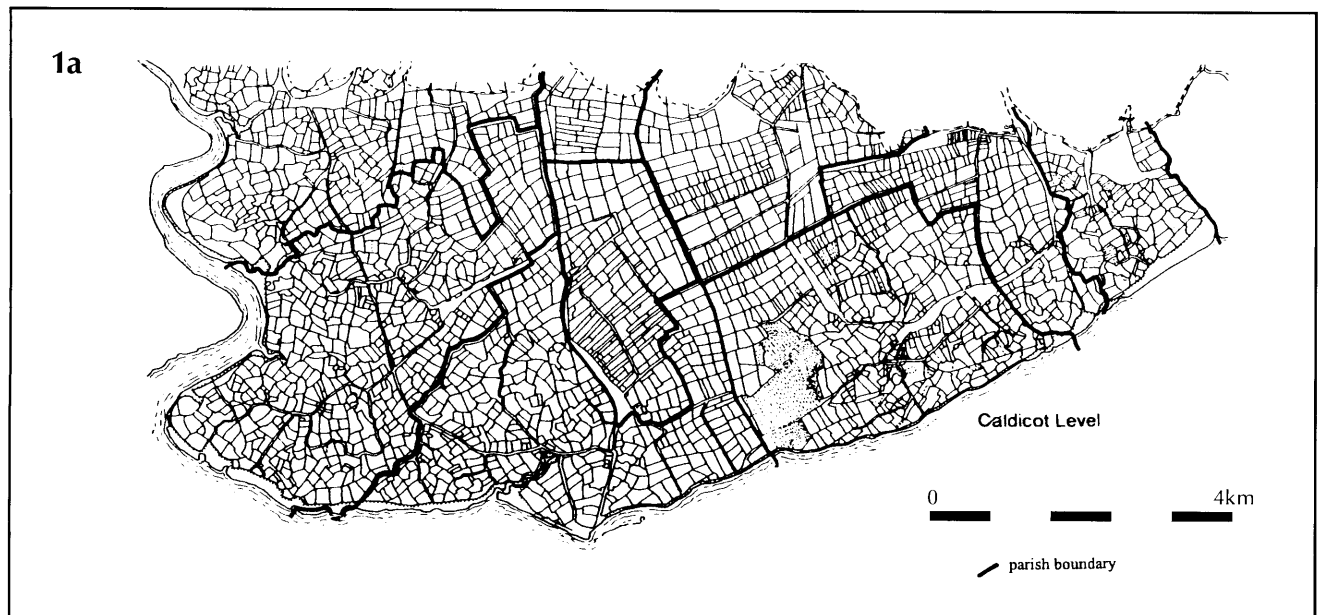
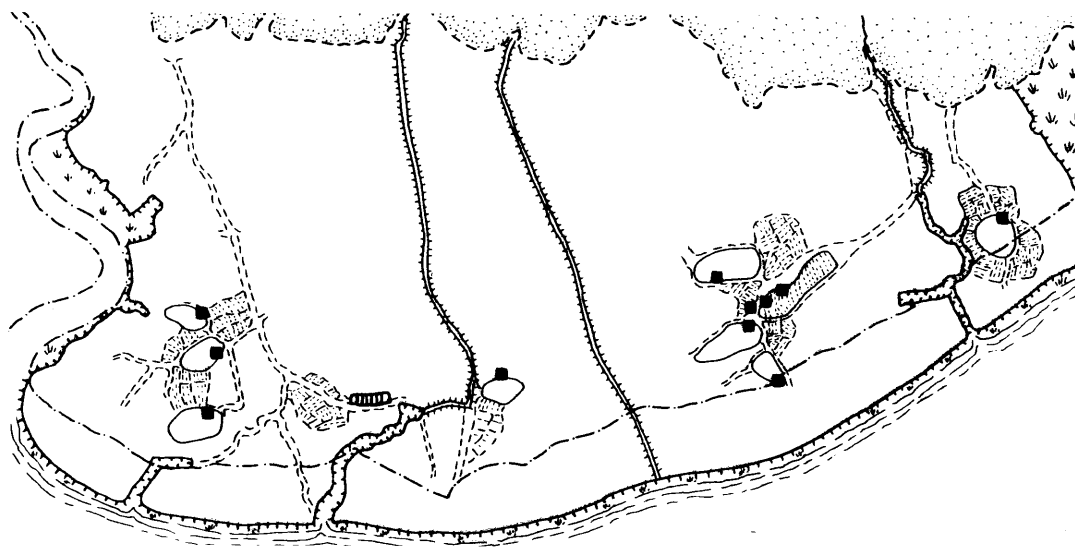
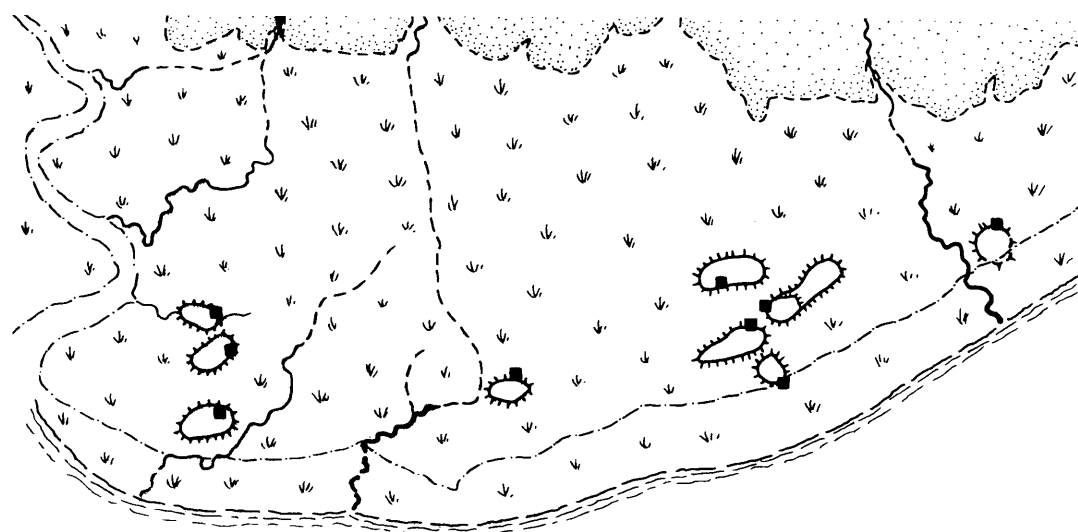
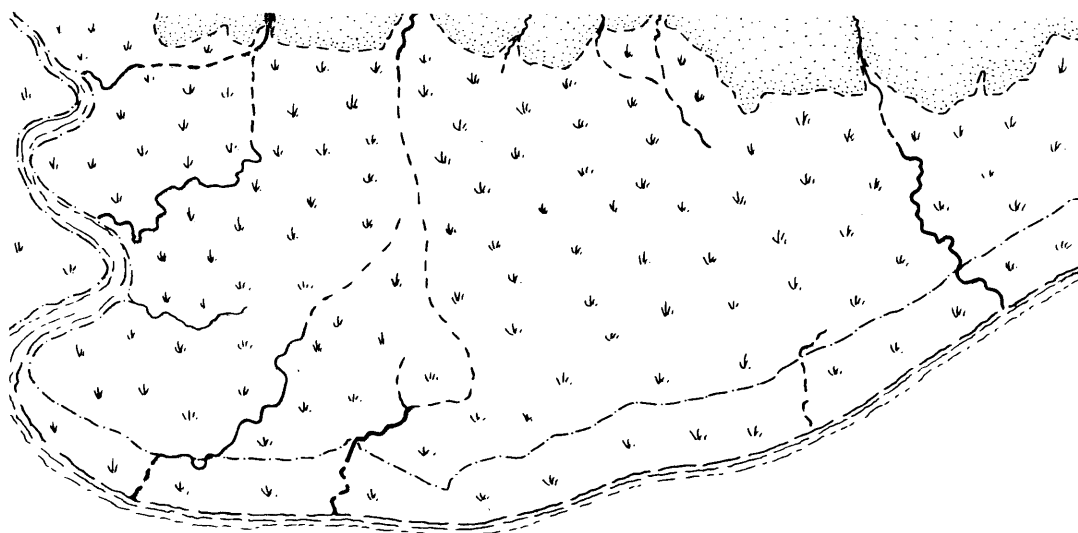


Figure 1a The Caldicot Level, Gwent, South East Wales. The historic landscape in 1831 (Commissioners of Sewers Map: Gwent Records Office D.1365/2), showing the pattern of fields and roads. Note the distribution of surviving open fields. Caldicot Moor (on the far right) survived as an intertidal marsh used as common pasture

1b



(1b contd)

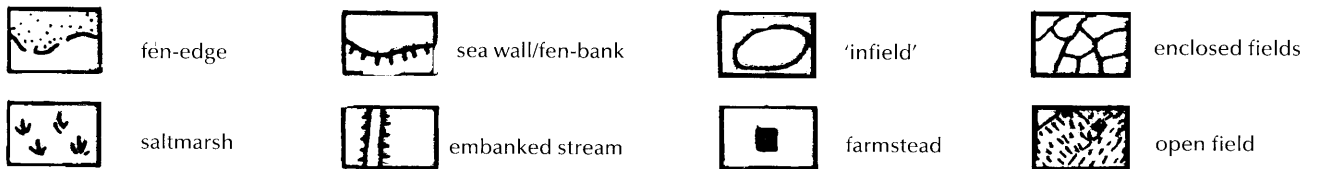
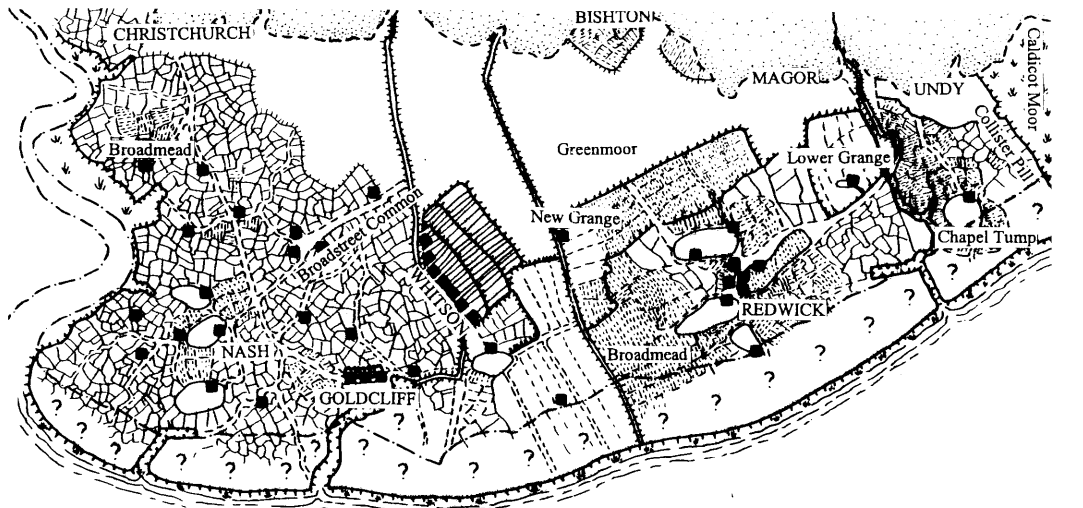


Figure 1b Suggested sequence for the earlier phases of landscape evolution.

The higher, coastal parts of the intertidal saltmarsh were colonised through the construction of a series of small, oval-shaped ring dikes, which may initially have only afforded protection from flooding during the summer months. The course taken by a number of the streams that flowed off of the adjacent uplands is unclear.

A sea wall was subsequently constructed along the coast, and streams flowing off the adjacent uplands were canalised to avoid freshwater flooding of the areas now protected from tidal inundation. The early ring-dike enclosures became the focus for settlement, perhaps acting as infields.

As population increased, and the demand for land increased, further land was enclosed and drained, initially in a piecemeal fashion (hence the irregular landscapes of the higher coastal areas), and later in a more planned fashion (hence the more regular landscapes towards the lower-lying, backfen areas). Fen-banks protected these lower-lying areas from freshwater flooding. Different estate owners followed different strategies with regard to the development of their estates, reflected for example in the more nucleated settlement associated with common fields in Redwick, and the dispersed settlement pattern and predominantly enclosed fields in Nash

centuries onwards – well documented and with well-dated ceramic sequences – that have received most attention: the origins of these landscapes are more difficult to uncover, and have been rather neglected. The earliest phases of reclamation remain particularly obscure.

By the nineteenth century, local legend in a number of areas claimed that the first attempts at drainage were undertaken by 'the Romans' (e.g. the Caldicot Level, Gwent: Knight 1962; Fenland: Hall 1977; Romney Marsh: Eddison 2000), but the results of recent survey, excavation, and palaeo-environmental analysis has shown that very few coastal wetlands were in fact reclaimed in the Roman period (Rippon 2000b). That particular transformation of the landscape appears to have been restricted to the Severn Estuary, and though elements of these drainage schemes may survive in a handful of places (Fulford *et al.* 1994), in most marshland areas of Britain the Roman-period landscape is buried under later alluvium, with the result that the historic landscapes of these coastal wetlands post-date this major episode of marine transgression (Rippon 2000a).

The extent of settlement, population, and ploughteams in Domesday suggests that most of the more extensive coastal wetlands were reclaimed by the later eleventh century, and the physical relationship between medieval settlement patterns (revealed through fieldwalking, documents, or standing buildings) to the extant networks of fields and roads suggests that the basic fabric of the historic landscape in these areas was also in place by that time. It would appear, therefore, that the origins of our marshland landscapes lie after the period of late/post-Roman flooding, and before the later eleventh century. There are three key issues: when were these marshlands colonised, what was the process whereby intertidal saltmarshes were transformed into freshwater, reclaimed landscapes, and who was responsible for this major undertaking? The issues of dating and who was responsible for initiating reclamation are dealt with elsewhere (Rippon 2000b, in press); what follows is a tentative contribution to the second issue, that of how the colonisation of coastal marshes began.

Reclamation and Construction of Sea Walls

Today, our coastal wetlands shelter behind massive embankments that hug the coast. It has been assumed that this was always the case, with the

earliest sea wall built along the coast and major tidal rivers, with the area so protected from inundation being settled later, starting with the higher coastal areas (e.g. Rippon 1996a, fig 4; 1997a, fig 7). However, recent archaeological work has shown that this was not always the case, and that there was sometimes an initial phase of settlement, perhaps seasonal, on the open saltmarsh.

In Fenland, for example, the earliest phases of medieval colonisation have been researched through the Fenland Survey and subsequent Fenland Management Project (see Crowson *et al.* 2000; Hall and Coles 1994; and individual *Fenland Survey* volumes). In general, the sequence appears as follows (see Rippon 2000b). During the fifth and sixth centuries, when 'Early Saxon' pottery was in circulation, settlement concentrated around the margins of the coastal saltmarsh and inland, freshwater, backfen. Around the seventh century, as 'Middle Saxon' Ipswich ware type pottery came into use, settlement shifted onto slightly raised relict creek-banks in the higher coastal marshes, and though some attempt was made to improve drainage through the construction of ditches, these areas remained an essentially intertidal environment. It was only around the tenth century that a sudden environmental change occurred, with freshwater replacing intertidal conditions, indicating that the area was now protected from inundation by a sea wall. Settlement concentrated in a series of nucleated villages often located around small greens, at the head of long droveways that led down into the lower-lying backfens. The patterns of roads and fields around these early settlements, on the higher coastal areas, was irregular in layout resulting in part from the incorporation of naturally meandering saltmarsh creeks into the post-reclamation field boundary pattern, and otherwise suggesting a gradual and piecemeal approach towards enclosure and drainage. By contrast, as more land was required, and settlement expanded down the droveways towards the backfen, a more co-ordinated and systematic approach towards reclamation was adopted. As lower-lying ground in the backfens was enclosed the major source of flooding became freshwater runoff from the adjacent uplands, leading to a series of fen-banks constructed parallel to the fen-edge/coast (e.g. Fig. 1).

This initial phase of settlement on the unreclaimed marsh is paralleled on the continent during both the Roman and early medieval periods, and experiments on modern saltmarshes in Germany have shown that it is possible to raise a number of crops in such environments (see Rippon in 2000b

for a fuller discussion). In Britain, the relatively few areas of extensive saltmarsh that were left unreclaimed by the post-medieval period appear to have been used mostly as common pasture, though there are references to their having been cropped for meadow (e.g. Rumney Wharf near Cardiff: Reeves 1977, 300). Analogy with mainland Europe also suggests that the initial attempts at embankment may not have been designed to provide year-round protection from inundation. An alternative sequence is for there to have been seasonal 'summer dikes' which protected small areas of marsh associated with individual settlements from summer floods, that were only later replaced by a continuous sea wall built along the coast (Fig. 1). A number of such low embankments that probably provided only seasonal protection have been recorded in the Netherlands dating to the Roman period, including Broekpolder in the west (Linda Therkorn *pers comm.*, August 2000), and sealed beneath *terpen* mounds at Donjum-Heringa, Peins-Oost and Wijnaldum-Tjitsum in the north (Bazelmans *et al.* 1999; Besteman *et al.* 1999). Summer, or 'ring', dikes were also constructed during the early medieval period on the coastal marshes of mainland North West Europe, before being replaced by a continuous embankment (Bazelmans *et al.* 1999; Behre 1990, 38-9; Mayhew 1973, 48; Schmid 1990). Such summer dikes still continued to function as late as the early nineteenth century on the island of Ameland, off the Netherlands, before their destruction through enclosure and reallocation schemes (Bazelmans *et al.* 1999). The Ameland enclosure was used as a common meadow, subdivided between large numbers of tenants each of whom received a proportion of the strips each spring (a system that is very similar to that which prevailed in British common meadows, including those of the Somerset Levels: Brian 1999).

Around the Severn Estuary, the majority of saltmarshes were eventually reclaimed through constructing a sea wall along the coast. The one notable exception was Caldicot Moor, being that part of the Gwent Levels that fell within the lordship of Chepstow (Fig. 1; Rippon 1996a, 77-8; in press). This remained an area of common pasture, which was occasionally flooded by the sea, though an attempt was made to enclose one area of the higher ground known as 'Twimple' (PRO MPC 116; Bradney 1929, 110-23). Though very little is known about this enclosure, it does not appear to have been settled, or regularly ploughed (other areas of ancient enclosure being covered in well-developed ridge and furrow). There are eighteenth century accounts of rudimentary divisions being made of

the intertidal marshes (e.g. Bradney 1929, 115), and it is tempting, based on its position, morphology, and similarity to the Ameland enclosure, to see it as a seasonal embankment designed simply to protect an area of meadow during the summer months.

Early enclosures on the Severn Estuary marshes

As with Fenland, in the coastal marshes of the Severn Estuary the earliest areas to be settled are characterised by highly irregular landscapes (e.g. Fig. 1). However, in this area, pottery does not appear to have circulated widely in the rural landscape until around the eleventh or twelfth century, and although tenth century material is now being recognised on a number of sites, the region is aceramic before that date. In common with other major coastal wetlands, the extent of settlement and ploughteams recorded in Domesday suggests that extensive areas had already been reclaimed by that date, but in the absence of datable material culture, and earlier documentary sources, we must interrogate the historic landscape itself in order to understand the earliest stage of wetland colonisation.

When the patterns of roads, fields and settlements of these historic landscapes are carefully dissected, a relative sequence of features can be identified. The earliest appear to have been distinctive oval-shaped enclosures around which the rest of the historic landscape formed (e.g. Figs. 2-4). Soon after their recognition these features were given the name 'infields' (Rippon 1994; 1996a; 1997a), though this interpretation is in need of more careful consideration. Taken collectively, these enclosures have a number of common characteristics:

- they are restricted to the higher, coastal areas of the Levels (that were the first to be settled, enclosed and drained) either in clusters (e.g. Redwick on the Caldicot Level: Fig. 1; Rippon 1996a, fig 27; and Withy in Huntspill: Fig. 2; Rippon 1994, fig 12.4) or individually (e.g. Puxton in North Somerset: Fig. 3; Rippon 1996b; 1997b; 1998; 1999; and Vole in Somerset: Fig. 4)
- roads and droveways run towards the enclosures (suggesting that they are stratigraphically early in the formation of the historic landscape), but then pass around them
- their shape is generally oval (also suggesting that they were created relatively early, in a

landscape that was not too cluttered with other features: see below)

- occasionally there is evidence for a bank running around the enclosure's perimeter
- their size is typically c.5-19 ha (12-47 acres); average 13 ha (32 acres)
- extant farms are almost always located on the edge or just outside the enclosed area (suggesting that they represent areas of agricultural land, not an enclosed settlement, which has been confirmed by survey and excavation at Puxton: see below)
- a number are associated with churches or chapels (suggesting some pre-eminence in the settlement pattern, again possibly indicating their relatively early origins)

Accounting for the oval shape

One of the main character defining features of these enclosures is their oval shape which may

potentially be accounted for in a number of ways, notably that they:

- are related to small bedrock islands
- are related to morphologically-similar early Christian sites
- have adopted the most economical shape for the first areas to be enclosed within a previously unsettled landscape.

Few of these sites have been surveyed in detail. Relatively crude surveys carried out in advance of the construction of the M5 motorway suggest that Withy Farm, Withy Bow Bridge and Withy Road Farm show no elevation difference compared to the surrounding areas (data was plotted to the nearest foot); Hackness may be slightly lower-lying than the surrounding areas. More accurate surveys at Middle Lane and Ham Farm in Kingston Seymour suggests those enclosures are c.0.10-0.15 m above the surrounding areas (Gilbert 1996, 56), though the significance of such differences, in a landscape that, due to long-term subsidence into deeply buried rock-cut features and more recent palaeochannels, is never completely flat, is unclear. Work at Puxton,

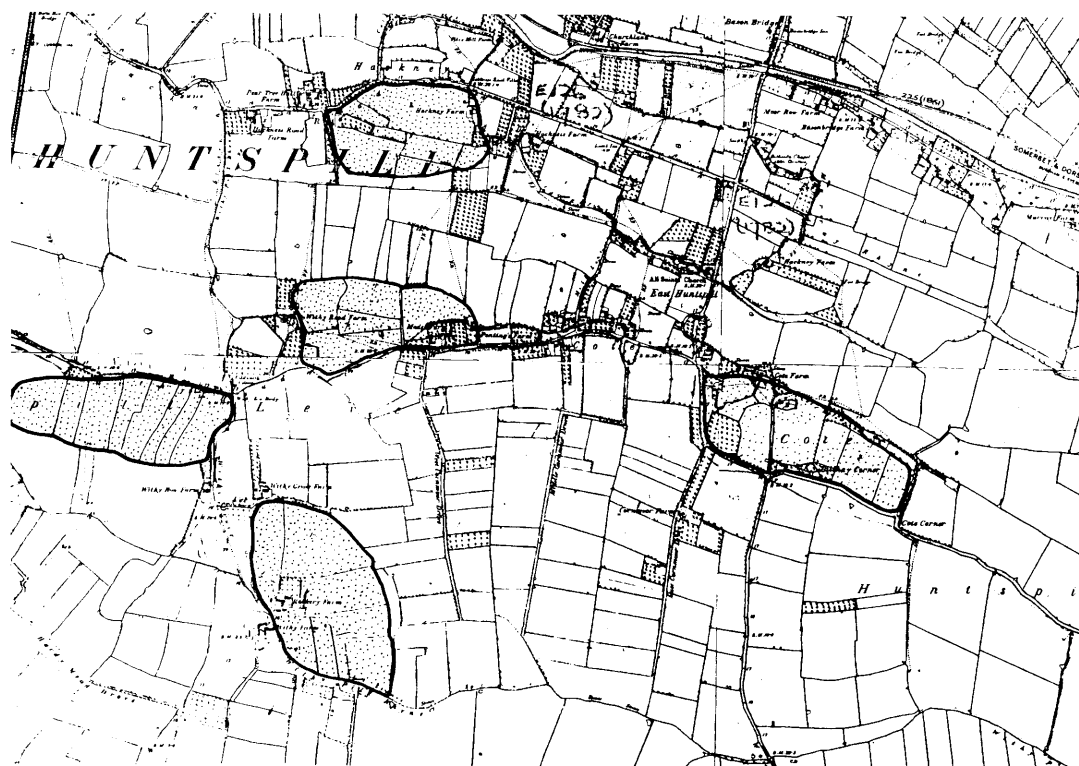


Figure 2 A cluster of 'infields' at East Huntspill, Somerset (Hackney, Cote, Withy Road Farm, Withy Bow Bridge and Withy Farm). Note the series of fields within the enclosure at Withy Bow Bridge (on the far left) with a reversed-S profile, and how farms all lie at the edges of the enclosures. Withy is relatively well documented, being a detached part of Glastonbury Abbey's manor of Shapwick

the only site to have seen detailed survey and excavation, showed that it was only a small number of platforms that were raised, and that this was accounted for by a build up of occupation debris, not the occurrence of a bedrock 'island'. Indeed, none of the Severn Estuary enclosures are shown on geological or soil survey maps as being bedrock islands, and excavations for a trout lake at Middle Lane in Kingston Seymour to a depth of 3 m, and archaeological investigations at Puxton to a depth of 2 m, failed to reach bedrock (Gilbert 1996, 56; Rippon 1996a). In contrast to a number of low bedrock islands in the Levels (e.g. Chedzoy and Sowey in the Parrett Valley, Somerset; Godney in the

Brue Valley, Somerset; Hillsea in Yatton, North Somerset), none of the 'infield' enclosures have 'ey' (island') names (though there is a Hackney Farm at Hackness, in Huntspill: Fig. 2). Overall, there is no evidence that the shape of these enclosures results from their being located on bedrock.

A number of the 'infields' are associated with medieval churches or chapels (Table 1), though their scale is altogether different to the curvilinear churchyard enclosures that are characteristic of many parts of Wales and Cornwall, and which are typically just 0.2 – 0.4 ha (Brook 1992, 85; Preston-Jones 1992, 106; Silvester 1997, 114). A closer parallel

| | area | church or chapel |
|-----------------------------------|-----------------------------|-------------------|
| Central Somerset | | |
| Withy Farm (East Huntspill) | 17.9 ha (44.2 acres) | |
| Withy Bow Bridge (East Huntspill) | 16.5 ha (40.8 acres) | |
| Withy Road Farm (East Huntspill) | 14.1 ha (34.8 acres) | |
| Hackness (East Huntspill) | 11.8 ha (29.2 acres) | |
| Cote (East Huntspill) | 16.5 ha (40.8 acres) | |
| Huntspill Court (West Huntspill) | 15.3 ha (37.8 acres) | |
| Manor Farm (Lymphsham) | 7.9 ha (19.5 acres) | medieval church |
| Vole (East Brent) | 9.4 ha (23.2 acres) | |
| Rooksbridge (East Brent) | 17.6 ha (43.5 acres) | |
| Chapel Farm (East Brent) | 12.6 ha (31.1 acres) | chapel place-name |
| East Bower (Bridgwater) | 7.4 ha (18.3 acres) | |
| <i>average</i> | <i>13.4 ha (33.1 acres)</i> | |
| North Somerset | | |
| Middle Lane (Kingston Seymour) | 30.0 ha (74.1 acres) | |
| Poplar Farm (Kingston Seymour) | 16.5 ha (40.8 acres) | |
| Ham Lane (Kingston Seymour) | 7.9 ha (19.5 acres) | |
| St Georges (Banwell) | 13.7 ha (33.9 acres) | medieval chapel |
| Chestnut Farm (Hewish) | 13.0 ha (32.1 acres) | |
| Puxton | 6.3 ha (15.6 acres) | medieval chapel |
| <i>average</i> | <i>14.6 ha (36.1 acres)</i> | |
| Caldicot Level | | |
| Greenstreet (Redwick) | 21.6 ha (53.4 acres) | medieval church |
| Longlands (Redwick) | 17.7 ha (43.7 acres) | |
| South Row (Redwick) | 15.7 ha (38.8 acres) | |
| Sea Street (Redwick) | 8.2 ha (20.3 acres) | |
| Chapel Tump (Undy) | partly eroded | chapel place-name |
| Farmfield (Nash) | 12.9 ha (31.9 acres) | |
| Nash | 9.8 ha (24.2 acres) | medieval church |
| Burnt House Farm (Nash) | 5.9 ha (14.6 acres) | |
| Whitson | 2.9 ha (7.2 acres) | medieval church |
| <i>average</i> | <i>11.8 ha (29.2 acres)</i> | |
| Wentlooge Level | | |
| St Brides | 9.7 ha (24.0 acres) | medieval church |
| Overall Average | 13.0 ha (32.1 acres) | |

Table 1 'infield' enclosures of the Severn Estuary: areas of better preserved examples

wetlands, and though no such difference was discernable at Puxton, this might be due to a number of factors: that it lay a considerable distance inland, that it was above Mean High Water Spring Tide (MHWST) but below Highest Astronomical Tide (HAT), and/or that by the time the occasional tidal floods reached this area they had dumped most of their sediment. Alternatively, the Puxton embankment may only have functioned as a sea wall for a very brief time as very soon after its construction it was made redundant through the creation of a sea wall further towards the coast.

For the Severn Estuary enclosures to have functioned as sea walls, they must have lain below HAT (which in the Estuary is around 1.3-1.4 m above MHWST), though establishing what this was in the medieval period is difficult. High water level in the sally port at Bristol Castle lay between 11.8 and 12.4 m OD, some 4 m above the modern MHWST (6.95 m), but the value of this observation is questionable as sluice gates may have been used to retain tidal and river-waters within the ditch for defensive reasons (Ponsford 1981, 104). More accurate measures of medieval MHWST have been gained from the height of accreted marsh deposits at the waterfronts at Dundas Wharf (c.6.4 m OD) and Canynges House (c.6.6-6.7 m OD), that is some 0.5 m below that of today at this point on the river (Jones 1991, 19). It is difficult to scale this back to the open Estuary but the difference between medieval and modern MHWST is likely to have been more rather than less due to the attenuation/weakening of tidal waves in the river Avon (J. Allen *pers comm.* 2000). In the Inner Severn Estuary, Allen (1991) has compared the elevations of still actively accreting saltmarshes with those that were reclaimed during the medieval period, and suggests that MHWST around AD 1300 was c.0.9 m lower than today (and see Allen and Rae 1988).

Most of the Severn Estuary 'infield' enclosures lie on the more extensive areas of marshland adjacent to the outer Estuary. They generally lie at around

c.5.4 m OD in East Huntspill and Brent, c.5.5-5.8 m OD in North Somerset, and c.6.1 m OD on the Gwent Levels (the surface of these marshes reflecting the increase in MHWST up the Estuary: Hawkins 1992, fig 6). The MHWST for these stretches of coast are approximately 5.8 m OD, 6.1 m and 6.7 m OD respectively, with the Highest Astronomical Tides (HAT) around 1.3 m higher. Assuming that the medieval figures were around 0.9 m lower, it would appear that the Severn Estuary infields were about 0.3-0.5 m above their contemporary MHWST, but nearly 1 m below the HAT (Table 2).

The possible function of the Severn Estuary enclosures as agricultural core areas

So what was the function of these early enclosures? There is no evidence that they were enclosed settlements. Earthwork, soil chemistry, and fieldwalking surveys at Puxton all indicate that occupation was restricted to a series of slightly raised platforms in the north eastern corner of the enclosure by the church, with the remaining area being occupied by lightly manured paddocks (Rippon 1997b, fig 11). The enclosure appears, therefore, to have been an area of agricultural land with the associated settlement tucked to one side (as is still the case with the farms that are associated with these enclosures all around the Estuary [e.g. Figs. 2-4]). At Withy Bow Bridge (Huntspill), the enclosure is filled with reversed-S profile fields indicating prolonged arable cultivation (Fig. 2; Rippon 1994, fig 12.4), with another possible example within the earlier of the two enclosures at Greenstreet, Redwick (GwRO D.1365/2).

The Severn Estuary 'infields' average around 13 ha (32 acres; Table 1), though most fall into one of two size groupings between 6-10 ha (15-25 acres; 35%) and 12-19 ha (30-47 acres; 54%). Both would have provided sufficient arable to support one family

| | <i>height of 'infield'</i> | <i>current MHWST</i> | <i>medieval MHWST</i> | <i>current HAT</i> | <i>medieval HAT</i> |
|-----------------|----------------------------|----------------------|-----------------------|--------------------|---------------------|
| Huntspill/Brent | c. 5.4 m | c. 5.8 m | c. 4.9 m | c. 7.1 m | c. 6.2 m |
| North Somerset | c. 5.6 m | c. 6.1 m | c. 5.2 m | c. 7.4 m | c. 6.5 m |
| Gwent Levels | c. 6.1 m | c. 6.7 m | c. 5.8 m | c. 8.1 m | c. 7.2 m |

Table 2 Approximate measures of medieval tidal levels around the Severn Estuary

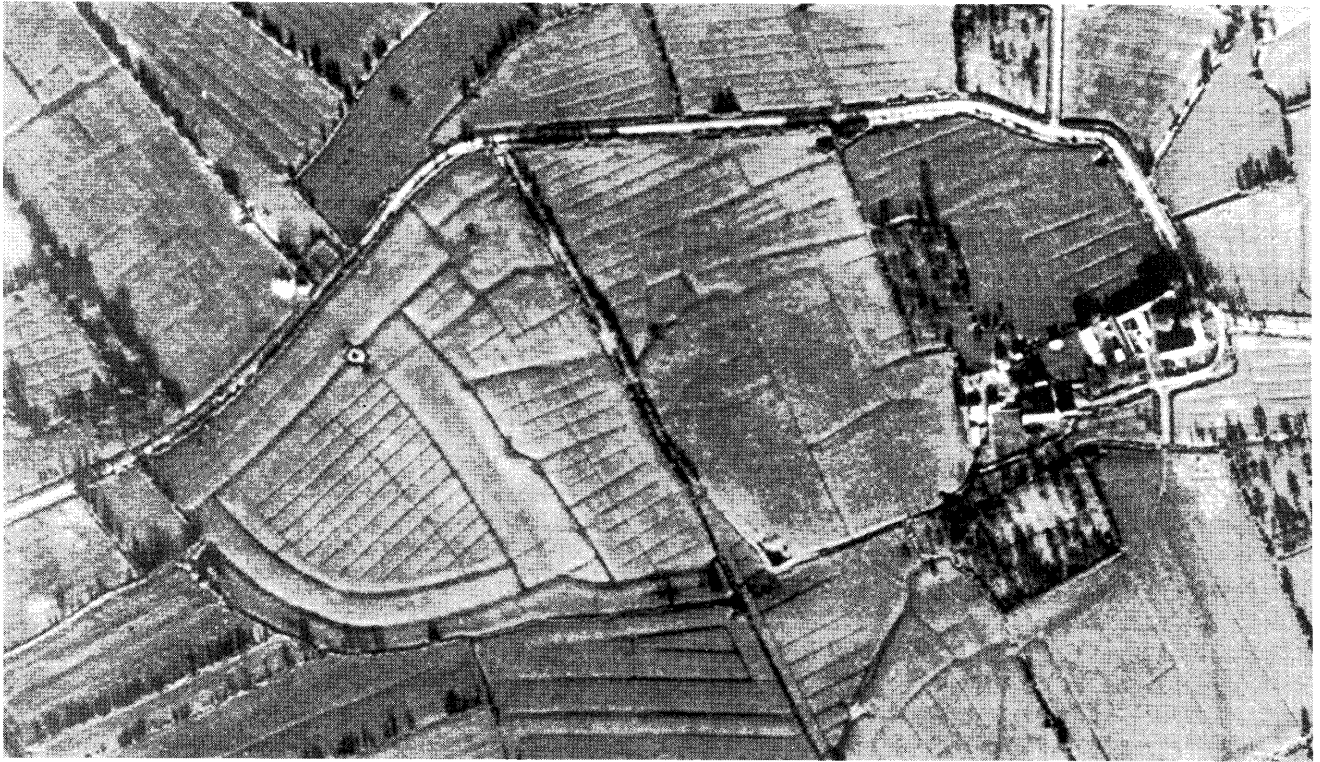


Plate 1 Vole, Somerset (TUD/UK 15119 part III print 5237 [13th Jan. 1946].
Crown Copyright 1946/MOD.)
(Reproduced with permission of the Controller of HMSO)

within a mixed-agricultural regime, as Taylor (1987, 62) suggests that around 30 acres (12 ha) of land *in total* would support one family, with similar estimates from local studies in Southwest Britain. On Glastonbury Abbey's marshland manor of East Brent, for example, the average size of a tenant holding in 1189 was 15.4 acres (6.2 ha; Harrison 1997, table 5.04a), while in Devon, Finberg (1951, 40) suggests that a peasant required 15 or 16 acres of arable (6.1-6.5 ha). Green (2000, 35-9) found that morphologically very similar enclosures in northern Devon/western Somerset were mostly 20-70 acres (8-28 ha). The Severn Estuary examples are broadly comparable, though lying towards the lower end of the Devon/Somerset range, which may be accounted for in terms of the greater soil fertility on the Levels, and the abundance of rich meadow and pasture.

Infields and Outfields?

It is argued here that these enclosures represent core agricultural areas – infields in one sense – that initially afforded some protection from tidal flooding, notably during the summer months, before the construction of a continuous sea wall along the coast. The use to which the surrounding marshes were put is unclear, though they would



Figure 4 The 'infield' enclosure at Vole, East Brent, Somerset

have provided excellent grazing and would have been perfectly capable of supporting rich meadow, as was case into the post-medieval period on areas of saltmarsh that remained unreclaimed (Reeves 1977, 299).

Once that coastal embankment had been constructed, the old 'infields' became redundant although their location next to settlements, some of which had become manorial and/or parochial centres, ensured their continued use as core agricultural areas. At Puxton, a sequence of intakes is recognisable (Fig. 3), and though the intensity with which the different areas were exploited is unclear, the primary enclosure appears to have been the most heavily manured. There is little firm evidence for the occasional cultivation of 'outfield' areas on the Severn Estuary Levels as might be expected in an area of fertile soils and an abundance of pasture. Over a long time perspective, however, there were fluctuations in the extent of enclosure and drainage that is evidenced by relict landscapes on Huntspill (Rippon 1997a, 210-12) and Banwell Moors (Rippon 1997b, 44-6). A number of closely spaced drainage features excavated on Banwell Moor (Rippon 1997b, fig 6) were associated with small amounts of medieval pottery and may represent one or more attempts to drain or even cultivate part of this, one of the lowest-lying parts of the North Somerset Levels. The complex disposition of arable, pasture and meadow in the reclamations of Glastonbury Abbey's manors in the Brue and Parrett valleys may also indicate the occasional and unsystematic extension of arable cultivation of what were mainly areas of arable and pasture (Musgrove 1999). Reference in the thirteenth/fourteenth centuries to 'Stubbrech' meadow in Sow, and 'la Breche' in the moors of Walton, may suggest occasional cultivation of the moors beside the river Parrett (Musgrove 1999, 309).

Parallels for the Severn Estuary 'infields'

It is difficult to find comparable features on other coastal marshes in Britain, although the turf dike that enclosed some 425 acres at Wheldrake, in the Vale of York, may represent an infield on a far larger scale (Sheppard 1966). In the Norfolk Marshland, an irregular landscape on the higher coastal marshes is not that dissimilar to the pattern seen around the Severn in suggesting a gradual and piecemeal colonisation. This landscape contains a number of possible 'infield' enclosures such as Walpole St Peter (15 ha) and West Walton (25 ha).

In contrast, just across the Nene Estuary on the Cambridgeshire silt fens, a far more regularly arranged landscape suggests some degree of planning and co-ordination in its initial colonisation, and potential 'infields' are noticeably absent. On Romney Marsh another highly irregular landscape that clearly results from gradual and piecemeal enclosure and drainage, contains a small number of possible 'infields', notably at Snave. Further work is needed on the cartographic and air photographic sources, but it would appear that the Severn Estuary is not alone in seeing the creation of these early enclosures.

Discussion

It is argued here that the oval-shaped enclosures that are so characteristic of the higher coastal marshes of the Severn Estuary Levels represent the earliest elements of the historic landscape. It is suggested that they represent individual intakes in what remained an intertidal marsh, and that it is possible that they were initially only intended to protect a small area of agricultural land from summer floods (as was the case on the near continent). They acted as infields in the sense of being a core agricultural area, and although it is not known whether there was cultivation on the open marsh this area was certainly used less intensively. Probably not long after the construction of these ring dikes, the decision was taken to construct sea walls along the coast, making the earlier embankments redundant. Although the ring dike's banks may have been removed (as they would have hindered the post-reclamation drainage), their associated drainage ditches remained a valuable part of the drainage system and so have survived to this day.

It is not suggested that these early enclosures were infield/outfield systems in the classic sense, but it is possible that they reflect an approach current in the late first millennium AD towards the colonisation of land that was based upon a small core area that was surrounded by less intensively used ground. Even after the enclosure and drainage of the surrounding areas, the location of the early enclosures next to the settlements ensured that they remained core agricultural areas for some time. On dryland areas such early arrangements may have been swept away by later landscape evolution, but the premium placed upon drainage on coastal wetlands ensured that such early features have survived.

In recent decades there have been great advances in our understanding of landscapes characterised by open field systems, though less attention has been paid to more irregularly-arranged common fields and the wholly enclosed patterns of fields that occurred outside the Midlands. Although coastal marshes, like upland fringes and the poor sandy soils of Breckland, can all be regarded as physically challenging environments that would normally be cultivated only after areas that were more suited to settled agriculture had been colonised, the excellent preservation of their historic landscape allows this processes to be observed in great detail, and may provide a model for how contemporary landscapes were evolving elsewhere. Whilst one key feature of the Severn Estuary infields – their encircling bank – is a direct response to difficulties in the natural environment (the threat of tidal flooding), another feature – their oval shape – was not. This results from their being created in a relatively featureless landscape, with little to constrain their shape other than the desire to create as short a perimeter per area enclosed as possible. As such, the creation of a small, roughly oval-shaped, enclosed infield, with less intensive exploitation of an outfield beyond, is the logical way that any previously unsettled landscape will have been created. It is not surprising, therefore, to find similar features in a variety of woodland and upland-fringe environments.

Overall, there may not be anything special about the Severn Estuary 'infields' other than the fact that they have survived where others have been lost, either in the transformation of landscapes through the creation of open fields, or more gradual and piecemeal evolution in more ancient landscapes. 'Infield-outfield' systems are a logical way of exploiting an uncrowded landscape particularly in newly settled areas, and as such may provide a model for other, dryland, landscapes.

Acknowledgements

I would like to thank Jos Bazelmans, Danny Gerrets and Linda Therkorn for discussing the results of their recent excavations in the Netherlands, and Terry Green and Martin Gillard for access to their on-going research into the landscape of the Greater Exmoor region, and John Allen, Bob Jones and Toby Parker for discussing medieval sea levels in the Severn Estuary.

Bibliography

- GwRO (Gwent Records Office) D.1365/2: Commissioners of Sewers Map, Redwick
- PRO (Public Records Office) MPC 116: Map of the Manor of Caldicot
- SRO (Somerset Records Office) DD/CCH bx 7/6: Manorial Court Rolls of Wootton Courtney 1538-53
- Allen, J.R.L., 1991, 'Salt-marsh accretion and sea-level movement in the inner Severn Estuary: the archaeological and historical contribution', *Journal of the Geological Society of London* 148, 485-94
- Allen, J.R.L., 1999, 'The 'Rumensea' Wall and the early settled landscape of Romney Marsh' (Kent), *Landscape History* 21, 5-19
- Allen, J.R.L. and Rae, J.E., 1988, 'Vertical saltmarsh accretion since the Roman period in the Severn Estuary, southwest Britain', *Marine Geology* 83, 225-235
- Astill, G., 1988, 'Fields', in Astill, G. and Grant, A. (eds), *The Countryside of Medieval England* (Oxford, Blackwell), 62-85
- Aston, M., 1985, *Interpreting the Landscape* (London, Batsford)
- Atkin, M.A., 1985, 'Some settlement patterns in Lancashire', in Hooke, D. (ed), *Medieval Villages* (Oxford, Oxford University Committee for Archaeology), 171-85
- Bailey, M., 1989, *A Marginal Economy: East Anglian Breckland in the Later Middle Ages* (Cambridge University Press)
- Baker, A.R.H., 1973, 'Field systems of Southeast England', in Baker, A.R.H. and Butlin, R.A. (eds), *Studies of Field Systems in the British Isles* (Cambridge University Press), 377-429
- Baker, A.R.H. and Butlin, R.A., 1973a, *Studies of Field Systems in the British Isles* (Cambridge University Press)
- Baker, A.R.H. and Butlin, R.A., 1973b, 'Introduction: materials and methods', in Baker, A.R.H. and Butlin, R.A. (eds), *Studies of Field Systems in the British Isles* (Cambridge University Press), 1-40

- Baker, A.R.H. and Butlin, R.A., 1973c, 'Conclusions: problems and perspectives' in Baker, A.R.H. and Butlin, R.A. (eds), *Studies of Field Systems in the British Isles* (Cambridge University Press), 619-56
- Bazelmans, J., Gerrets, D., de Koning, J. and Vos, P., 1999, 'Zoden aan de dijk: Kleinschalige dijkbouw in de late prehistorie en protohistorie van noordelijk Westergo', *De Vrije Fries* 17, 7-74
- Behre, K-E, 1990, 'History of landscape and habitation in the coastal region of Niedersachsen', in Behre, K-E (ed), *Environment and Settlement History in the North German Coastal Region* (Wilhelmshaven), 5-66
- Beresford, M.W. and St Joseph, J.K.S., 1979, *Medieval England: an aerial survey* (Cambridge University Press)
- Besteman, J.C., Bos, J.M., Gerretts, D.A., Heidinga, H.A. and de Koning, J., 1999, *The excavations at Wijncaldum. Reports on Frisia in Roman and Medieval times I.* (Rotterdam)
- Blair, J., 1994, *Anglo-Saxon Oxfordshire* (Stroud, Alan Sutton)
- Bradney, J., 1929, *History of Monmouthshire, volume 4, part 1: The Hundred of Caldicot, Part 1* (London, Mitchell, Hughes and Clarke)
- Brian, A., 1999, 'The Allocation of Strips in Lammas Meadows by the Casting of Lots', *Landscape History* 21, 43-58
- Brook, D., 1992, 'The Early Christian Church East and West of Offa's Dyke', in Edwards, N. and Lane, A. (eds), *The Early Christian Church in Wales and the West* (Oxford, Oxbow Monograph 16), 77-89
- Buchanan, R.H., 1973, 'Field systems of Ireland', in Baker, A.R.H. and Butlin, R.A. (eds), *Studies of Field Systems in the British Isles* (Cambridge University Press), 580-618
- Crowson, A., Lane, T. and Reeve, J. (eds), 2000, *Fenland Management Project Excavations 1991-1995*, Lincolnshire Archaeology and Heritage Reports Series No. 3
- Dixon, P. 1994, 'Field-systems, rig and other cultivation remains in Scotland: the field evidence', in Foster, S. and Smout, T.C. (eds), *The History of Soils and Field Systems* (Aberdeen, Scottish Cultural Press), 26-52
- Dodgshon, R. A., 1994, 'Rethinking Highland Field Systems', in Foster, S. and Smout, T.C. (eds), *The History of Soils and Field Systems* (Aberdeen, Scottish Cultural Press), 53-65
- Dodgshon, R.A., 1998, 'The evolution of Highland townships during the medieval and early modern periods', *Landscape History* 20, 51-63
- Eddison, J. (ed), 1995, *Romney Marsh: the debatable ground* (Oxford)
- Eddison, J., 2000, *Romney Marsh: survival on a frontier* (Stroud, Tempus)
- Eddison, J. and Green, C. (eds), 1988, *Romney Marsh: evolution, occupation, reclamation* (Oxford, Oxford University Committee for Archaeology)
- Eddison, J., Gardiner, M. and Long, A. (eds), 1998, *Romney Marsh: Environmental Change and Human Occupation in a Coastal Lowland* (Oxford, Oxford University Committee for Archaeology)
- Elliott, G., 1973, 'Field systems of North West England', in Baker, A.R.H. and Butlin, R.A. (eds), *Studies of Field Systems in the British Isles* (Cambridge University Press), 41-92
- English, J., 1997, 'A possible early Wealden settlement type', *Medieval Settlement Research Group Annual Report* 12, 5-6
- Faith, R., 1997, *The English Peasantry and the Growth of Lordship* (London, Leicester University Press)
- Finberg, H.P.R., 1951, *Tavistock Abbey: a study in the social and economic history of Devon* (Cambridge)
- Finberg, H.P.R., 1969, *West country historical studies* (Newton Abbott, David and Charles)
- Fleming, A. 1994, 'Medieval and post-medieval cultivation on Dartmoor: a landscape archaeologist's view', *Devon Archaeol. Soc. Proc.* 52, 101-18
- Fleming, A. and Ralph, N., 1982, 'Medieval settlement and landuse on Holne Moor, Dartmoor: the landscape evidence', *Medieval Archaeology* 26, 101-37

- Ford, W.J., 1979, 'Some settlement patterns in the central region of the Warwickshire Avon', in Sawyer, P.H. (ed), *English Medieval Settlement* (London, Edward Arnold) 143-63
- Foster, S. and Smout, T.C. (eds), 1994, *The History of Soils and Field Systems* (Aberdeen, Scottish Cultural Press)
- Fox, H.S.A., 1981, 'Approaches to the adoption of the Midland System', in Rowley, T. (ed), *The Origins of Open-Field Agriculture* (London, Croom Helm), 64-103
- Fulford, M.G., Allen, J.R.L. and Rippon, S.J., 1994, 'The Settlement and Drainage of the Wentlooge Level, Gwent: Survey and Excavation at Rumney Great Wharf, 1992', *Britannia* 25, 175-211
- Gaffney, V. and Tingle, M., 1989, *The Maddie Farm Project: an integrated survey of prehistoric and Roman landscapes on the Berkshire Downs* (Oxford)
- Gilbert, P., 1996, 'The pre-Conquest Landscape at Kingston Seymour on the North Somerset Levels: Report on Survey 1996', *Archaeology in the Severn Estuary* 7, 53-7
- Gillard, M., Higham, R.A. and Rippon, S.J., 2000, 'Greater Exmoor: potential for medieval settlement studies and work in progress', *Society for Landscape Studies Newsletter*, spring/summer 2000, 4-7
- Green, T., 2000, *Early enclosures in a landscape of dispersed settlement: an examination of patterns detected in the field-boundaries of North Devon and West Somerset*, Unpublished MA Dissertation, Department of Archaeology, University of Exeter
- Hall, D., 1977, 'The sea bank in Cambridgeshire', *Proc. Camb. Ant. Soc.* 67, 67-9
- Hall, D., 1996, *The Fenland Survey, Number 10: Cambridgeshire Survey, The Isle of Ely and Wisbech*, East Anglian Archaeology 79
- Hall, D. and Coles, J., 1994, *Fenland Survey: An Essay in Landscape and Persistence*, English Archaeology Report 1 (London)
- Hallam, H.E., 1965, *Settlement and Society: a study of the early agrarian history of south Lincolnshire* (Cambridge University Press)
- Hallam, O., 1978, 'Vegetation and Land Use on Exmoor', *Somerset Archaeology and Natural History* 122, 37-51
- Harris, A., 1959, *The Open Fields of East Yorkshire*, East Yorkshire Local History Series 9
- Harris, A. 1961, *The Rural Landscape of the East Riding of Yorkshire* (Oxford University Press)
- Harrison, J., 1997, *The Composite Manor of Brent: a study of a large wetland-edge estate up to 1350*, Unpublished PhD thesis, University of Leicester
- Hawkins, A.B., 1990, 'Geology of the Avon Coast', *Proceedings of the Bristol Naturalists Society* 50, 3-27
- Hoskins, W.G., 1954, *Devon* (London, Collins)
- Hurst, J.D., 1983, 'The Wharram Research Project: Results to 1983', *Medieval Archaeology* 28, 77-111
- James, H., 1992, 'Early medieval cemeteries in Wales', in Edwards, N. and Lane, A. (eds), *The Early Christian Church in Wales and the West* (Oxford, Oxbow Monograph 16), 90-103
- Jones, G.R.J., 1973, 'Field systems of North Wales', in Baker, A.R.H. and Butlin, R.A. (eds), *Studies of Field Systems in the British Isles* (Cambridge University Press), 430-79
- Jones, R.H., 1991, 'Industry and environment in medieval Bristol', in Good, G.L., Jones, R.H. and Ponsford M.W. (eds), *Waterfront Archaeology*, Council for British Archaeology Research Report 74, 19-26
- Kissock, J., 1997, "'God Made Nature and Men Made Towns": Post-Conquest and pre-Conquest Villages in Pembrokeshire', in Edwards, N. (ed), *Landscape and Settlement in Medieval Wales* (Oxford, Oxbow), 123-38
- Knight, J., 1962, 'The Goldcliff Stone: a reconsideration' *Monmouthshire Antiquarian* 1(ii), 34-6
- Lane, T., 1995, *The Archaeology and Developing Landscape of Ropsley and Humby*, Lincolnshire Archaeology and Heritage Reports Series 2
- Mayhew, A., 1973, *Rural Settlement and Farming in Germany* (London, Batsford)

- Musgrove, D.J., 1999, *The Medieval Exploitation of the Peat Moors of the Somerset Levels*, Unpublished PhD thesis, University of Exeter
- Ponsford, M.W., 1981, 'Bristol' in Milne, G. and Hobley B. (eds), *Waterfront Archaeology in Britain and Northern Europe*, Council for British Archaeology Research Report 41, 103-4
- Postgate, M.R., 1973, 'Field systems of East Anglia' in Baker, A.R.H. and Butlin, R.A. (eds), *Studies of Field Systems in the British Isles* (Cambridge University Press), 281-324
- Preston-Jones, A., 1992, 'Decoding Cornish Churchyards' in Edwards, N. and Lane, A. (eds), *The Early Christian Church in Wales and the West* (Oxford, Oxbow Monograph 16), 105-24
- Reeves, A.C., 1977, 'The Custumal of Rumney Manor', *Bulletin of the Board of Celtic Studies* XXVII(ii), 298-302
- Rippon, S., 1994, 'Medieval Wetland Reclamation in Somerset', in Aston, M. and Lewis, C. (eds.), *The Medieval Landscape of Wessex* (Oxford, Oxbow) 239-53
- Rippon, S., 1996a, *Gwent Levels: The Evolution of a Wetland Landscape*, Council for British Archaeology Research Report 105
- Rippon, S., 1996b, 'Roman and medieval settlement on the North Somerset Levels: survey and excavation at Banwell and Puxton, 1996', in *Archaeology in the Severn Estuary 1996* (volume 7), 39-52
- Rippon, S., 1997a, *The Severn Estuary: Landscape Evolution and Wetland Reclamation* (London, Leicester University Press)
- Rippon, S., 1997b, 'Roman and medieval settlement on the North Somerset Levels: second season of survey and excavation at Banwell and Puxton, 1997', *Archaeology in the Severn Estuary 1996* (volume 8), 41-54
- Rippon, S., 1998, 'Roman and medieval settlement on the North Somerset Levels: the third season of survey and excavation at Puxton, 1998', *Archaeology in the Severn Estuary 1998* (volume 9), 69-78
- Rippon, S., 1999, 'Roman and medieval settlement on the North Somerset Levels: the fourth season of survey and excavation at Puxton, 1999', *Archaeology in the Severn Estuary 1999* (volume 10), 65-73
- Rippon, S., 2000a, 'The Romano-British exploitation of coastal wetlands: survey and excavation on the North Somerset Levels, 1993-7', *Britannia* 31, 69-200.
- Rippon, S., 2000b, *The Transformation of Coastal Wetlands: exploitation and management of marshland landscapes in North West Europe during the Roman and Medieval periods* (London, British Academy)
- Rippon, in press, 'Reclamation and regional economies of medieval Britain', in Raftery, B. (ed), *Recent developments in wetland research* (Dublin)
- Roberts, B., 1981, 'Townfield Origins: the case of Cockfield, County Durham', in Rowley, T. (ed), *The Origins of Open-Field Agriculture* (London, Croom Helm), 145-61
- Rowley, T., 1981, *The Origins of Open-Field Agriculture* (London, Croom Helm)
- Schmid, P., 1990, 'Habitation and Diking in Land Wursten', in Behre, K-E (ed), *Environment and Settlement History in the North German Coastal Region* (Wilhelmshaven), 95-6
- Sheppard, J.A., 1966, 'Pre-enclosure field and settlement patterns in an English township: Wheldrake, near York', *Geografiska Annaler* 48B, 59-77
- Sheppard, J.A., 1973, 'Field systems of Yorkshire', in Baker, A.R.H. and Butlin, R.A. (eds), *Studies of Field Systems in the British Isles* (Cambridge University Press), 145-87
- Silvester, R.J., 1988, *The Fenland Survey, Number 3: Norfolk Survey, Marshland and the Nar Valley*, East Anglian Archaeology 45
- Silvester, R.J., 1993, 'The addition of more or less undifferentiated dots to a distribution map?: the Fenland Project in Retrospect', in Gardiner, J. (ed), *Flatlands and Wetlands*, East Anglian Archaeology 50, 24-39
- Silvester, R.J., 1997, 'Historic Settlement Surveys in Clwyd and Powys', in Edwards, N. (ed), *Landscape and Settlement in Medieval Wales* (Oxford, Oxbow), 113-21

- Taylor, C.C., 1981, 'Archaeology and the origins of open-field agriculture', in Rowley, T. (ed), *The Origins of Open-Field Agriculture* (London, Croom Helm), 13-21
- Taylor, C.C., 1987, *Fields in the English Landscape*, 2nd edition (Gloucester, Alan Sutton)
- Uhlig, H., 1961, 'Old hamlets with infield and outfield systems in western and Central Europe', *Geografiska Annaler* 43, 285-312
- Whittington, G., 1973, 'Field systems of Scotland', in Baker, A.R.H. and Butlin, R.A. (eds), *Studies of Field Systems in the British Isles* (Cambridge University Press), 530-79
- Williams, M., 1970, *The Draining of the Somerset Levels* (Cambridge University Press)