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A249 IWADE BYPASS TO QUEENBOROUGH IMPROVEMENT

CULTURAL HERITAGE

VOLUME 2 PART 2

Mott MacDonald

Issue and Revision Record

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1 INTRODUCTION AND METHODOLOGY

1.1 General Introduction

The Environmental Statement comprises two volumes, and is also accompanied by a non-technical summary of the scheme and its impact on the environment.

Volume 1 of the Environmental Statement draws together the results of the assessment of the whole scheme.

Volume 2 of the Environmental Statement comprises detailed reports on the assessment of environmental affects by subject area. Each volume is individually bound and numbered as follows:

Part 1	Air Quality
Part 2	Cultural Heritage
Part 3	Ecology and Nature Conservation
Part 4	Landscape Effects
Part 5	Agriculture
Part 6	Traffic Noise and Vibration
Part 7	Pedestrians, Cyclists, Equestrian and Community Effects
Part 8	Water Quality and Drainage
Part 9	Policies and Plans

This volume assesses the impact of the A249 improvement on Cultural Heritage.

1.2 Identification of Receptors, Impacts, Effects and Significant Criteria

1.2.1 Identification of Receptors

The cultural heritage resources to be assessed, that contribute to the overall character of the historic environment, can be grouped into three broad categories:

- historic buildings;
- historic landscapes and townscapes;
- archaeological sites.

Historic buildings include statutory listed buildings (Grade I, II* and II), locally listed buildings and other features identified by local authorities, interest groups and the Consultant as being of historical interest. This definition also encompasses structures of historic merit such as railway bridges, boundary stones, statues etc.

Historic landscapes comprise visible elements of the landscape fashioned by human occupation such as field patterns, walls and hedgerows, drainage systems, lime kilns, barns, historic woodlands, village greens etc. Historic

townscape includes street patterns, squares, market places, walls and railings etc. They also include sites of historical events, namely battlefields and birthplaces of distinguished people.

Archaeological sites include a variety of features dating from palaeolithic to modern times and include ruins, stone circles, standing stones, burial chambers, crop and soil marks and finds scatters etc. They may be designated statutory sites such as Scheduled Ancient Monuments (SAMs) and local authority Archaeological Priority Areas. They also include palaeo-environmental geological features contained in gravels, drift, head material, alluvium and peat deposits.

1.2.2 Identification of Impacts and Effects

Potential impacts have been identified through a consideration of the construction, operational and maintenance requirements of the scheme, eg extent of landtake, level of traffic movements etc. Many impacts that occur during the construction phase are temporary in nature, but others may be experienced throughout the operational phase in which case they are long term. The following list comprises a range of impacts which may occur as a result of the scheme and which could result in effects on cultural heritage:

- temporary or permanent landtake;
- temporary or permanent severance;
- excavation and ground disturbance, including compaction;
- visual disruption during both construction and operation;
- disruption to local hydrology, drainage patterns, flows and volumes of subsurface water.

These impacts could lead to a set of effects on the archaeological and historic resources. Such effects have been identified as:

- complete or partial loss of the archaeological or architectural feature, or topographical evidence due to landtake;

- loss of the physical and visual integrity of the site due to severance, such that key relationships are lost. This is particularly important where features are clustered together (ie group setting), or where the historic setting of an archaeological monument, historic building or historic landscape/townscape feature is affected by visual intrusion;

- damage to resources due to changes in water levels;

- direct damage due to excavation; and

- indirect damage due to point loading and compaction.

1.2.3 Evaluative Criteria

(i) For Assessing the Importance of Historical Resource

The importance of archaeological sites, historic buildings, and landscape features varies considerably. The starting point for evaluating the sensitivity of the cultural heritage features will be to consider their legal or quasi-legal status (such as scheduled ancient monuments, conservation areas, listed buildings). The importance of cultural heritage features can be further defined by use of the non-statutory criteria for scheduling ancient monuments and listed buildings, as set out by English Heritage:

The criteria include:

(i)	survival	(vi)	documentation
(ii)	period	(vii)	group value
(iii)	rarity	(viii)	potential
(iv)	fragility	(ix)	amenity
(v)	diversity	(x)	conservation value

(ii) For the Significance of Impacts and Effects

There is no standard scale of comparison against which the severity of impacts on cultural heritage may be judged, because of the great variety of resources and receptors. Severity of impacts can be judged taking the following into account:

- the proportion of the feature affected and whether key characteristics would be affected, such as the setting of a listed building;
- consideration of the type, survival/condition, fragility/vulnerability, potential and amenity value of the feature affected.

1.2.4 Significance Criteria

The significance of effects is determined by integrating the importance of the historic resources with the severity of impact judged to occur there.

Major - Effects which breach national statutory designations and policy and affect sites of national importance. The effects are likely to be of particular importance to national statutory agencies, local authorities, national and local interest groups and the general public. Examples may include demolition or significant landtake within a SAM or Grade I listed building or significant intrusion into the setting of a SAM or Grade I listed building.

Moderate - Effects which conflict with national designations and local authority policies.

They also include effects which do not technically conflict with national or local policy but which are significant in having a major impact on features which are of particular importance at a county and local level with local authorities and special interest groups. Examples could include the demolition of a Grade II listed building, extensive landtake in a poorly preserved archaeological site (ie a site of degraded archaeological value), significant visual intrusion to a Grade II* listed building.

Minor - Effects which, although not breaching national or local policies, may be raised by local authorities and be of concern to local interest groups and the local public. These effects could be removed by incorporation of additional mitigation in the detailed design process. Examples may include the demolition or extensive intrusion of setting of unlisted historic buildings and loss of non-critical components of an archaeological site of local or county importance.

1.3 Background to the Assessment

The assessment has been prepared in accordance with Stages 1 to 3 of the Design Manual for Roads and Bridges in Volume 11 (Environmental Assessment).

Initial archaeological and historical baseline information was collected and assessed for the purposes of the Ove Arup & Partners Stage 2 Environmental Appraisal Report that was produced in November 1993, to inform the Secretary of States' decision of a Preferred Option for the Scheme and the subsequent period of Public Consultation.

The information contained in the Arup Report was based on a detailed archaeological study undertaken by Wessex Archaeology:

! Archaeological Survey - Stage 1 : Desk Study (October 1992)

The information in these reports was acquired by a comprehensive review of the existing historical data sources :

- statutory lists and maps of listed buildings and plans of scheduled ancient monuments;
- aerial photography;
- Ordnance Survey maps; and
- local authority records.

! Archaeological Survey - Stage 2 : Preliminary Field Evaluation (November 1992)

A site walkover survey based on the methods of rapid field scan and more detailed gridded fieldwalking was undertaken by Wessex Archaeology to gain a visual understanding and site specific awareness of the

study area.

Two additional archaeological reports were commissioned by Mott MacDonald Environmental Consultants in May 1995 and undertaken by the Canterbury Archaeological Trust:

- A249 - Kingsferry Bridge to Queenborough Roundabout Improvement Scheme - An Archaeological Note : Simon Pratt, (May 1995);

- Archaeological Survey Stage 3 Detailed Evaluation (July 1996).

The purpose of these reports, using local archaeologists with a specialised understanding of the area, were to supplement and update the historical baseline produced by Wessex Archaeology in 1992 and focus the analysis on the more limited geographical area of Study associated with the Preferred Option.

A detailed scoping report for the Environmental Statement was prepared in June 1996 and circulated to various consultees to obtain their comments on the extent and coverage of the proposed environmental assessment. Both English Heritage and Kent County Council Archaeologist were included in the exercise, and their comments incorporated where appropriate into the Stage 3 assessment.

1.4 Purpose of the Report

This Stage 3 Study (as defined by the Design Manual for Roads and Bridges, Volume 11), commissioned by Mott MacDonald of the Canterbury Archaeological Trust Ltd (CAT hereafter), examines in detail the archaeological setting and potential of the area affected by the proposed route of the Sheppey stretch of the A249 improvement scheme and that of the new fixed link, assesses the potential impacts and effects of the scheme upon the archaeological resource and proposes means of mitigating those effects.[1] It provides a detailed follow-up to recent reports by Wessex Archaeology on a Stage 1 Desktop Study (Seager Smith & Fitzpatrick 1992) and Stage 2 Preliminary Field Evaluation (Fitzpatrick & Seager Smith 1992), both of which covered a wider study area, including the mainland stretch, and to an informal note on the archaeological potential of the section of the preferred route between Kingsferry Bridge and Main Road, near Queenborough (Pratt 1995b).[2]

1.5 Scheme Outline and Scope of the Report

The proposed route incorporating the new bridge will join the recently complete Iwade bypass and span the Swale to the west of the existing Kingsferry Bridge. It crosses the railway line and joins the existing line of the A249 as far as the junction with Ferry Road, before moving offline to a new roundabout at Cowstead corner. The route

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[1] `Sheppey' is used throughout this report in its usual modern sense, ie, an amalgam of three islands, Harty, Elmley and the Minster/Leysdown hills (which once formed Sheppey proper), together with outliers at Rushenden and Queenborough. To these may be added shingle spits at Sheerness and Shellness and the extensive marshes, generally inned (reclaimed) in the medieval period. The suffix "-ey" derives from Old English *-ieg*, indicating an island (Wallenberg 1931, 24): it is thus tautological to refer to the Isle of Sheppey or of Elmley.

[2] Stages 1 to 3 are as defined in DOT 1994, Section 3, Part 2, Chapter 8.

continues offline to the south of the existing Queenborough Road, via a roundabout for the proposed Swale Gateway development, to a new junction with Main Road at Queenborough. This new junction will replace the existing roundabout and be controlled by traffic lights, incorporating pedestrian crossing facilities.

Where the new alignment follows the existing, a new road will be provided alongside to link Kingsferry Bridge with the old road. This will provide a safer alternative route for pedestrians, cyclists and other slow moving traffic.

For the purposes of this report, the study area has been re-defined as comprising a narrow corridor along the Sheppey stretch of the preferred route, including the Swale crossing and slip roads (Figure 1). However, in addition to sites and historic landscape elements which might be affected directly by the scheme, documentary, archaeological and topographic evidence regarding some neighbouring sites and finds, particularly at Kingsferry and along Queenborough Creek, is also examined. This material is included in order both to provide an overall archaeological setting for the study area and to provide some basis for assessment of the archaeological potential of the route. The paucity of earlier work, and thus of direct evidence, makes recourse to such material unavoidable.

1.6 Methodology

The Stage 1 study consisted of a preliminary survey of published and archive sources, including air photographs, statutory and local authority lists, Ordnance Survey maps *etc.* Excluding existing roads, railway and the Swale, the bulk of the reduced study area is under permanent pasture and the remainder, though arable, has been under pasture, at the time of writing (early December 1996), for several years, making fieldwalking unviable. Thus, although Stage 2 fieldwork did include preliminary fieldwalking, at 50 m intervals, where appropriate within the original study area in early November 1992,[3] only a rapid surface scan to identify standing earthworks and other superficial features was feasible within the reduced area addressed in this report. Preliminary fieldwork did not reveal the presence of any hitherto unknown features along the preferred route and the current report does not seek to duplicate the Stage 2 catalogue but integrates its results as appropriate. As noted below (Section 5.3.2), intrusive shallow evaluation trenching is generally inappropriate in areas of permanent pasture whilst any such work in arable land has been deferred until it may be better targeted, problems of access eased and the environmental impact subsumed into that of the overall construction work. Shallow (2 to 3 m) boreholes were drilled along two transects as part of the Stage 2 work but the results were inconclusive, confirming only that the `recorded sequence is wholly alluvial, relating to infill and general accretion of the Swale and the Medway Estuary generally during the later prehistoric and early historic periods' (Fitzpatrick & Seager Smith 1992, 14). This Stage 3 report is based upon the findings of the first two studies and a more thorough examination of topographic, bibliographic, cartographic and archival material. It has been augmented through consultation with other specialists (see Section 7.4) and by the writer's personal knowledge of the area under consideration. Each site or potential site identified has been assigned a degree of importance. The instances where constructional or operational (including maintenance) impacts may affect the archaeological resource have been described, an assessment made of the likely significance of such effects and a series of mitigation measures proposed.

[3] `As no concentrations or generalised distributions of material earlier in date than the post-medieval period were observed, no areas were selected for detailed collection and analysis' (Fitzpatrick & Seager Smith 1992, 13).

1.7 Structure of the Report

Following the introduction, Section 2 provides an overview of the Stage 1 work, and then examines some general aspects of the history and archaeology of Sheppey which are necessary to an understanding of the potential of the study area, including some neighbouring sites of relevance to the history of the exploitation of Queenborough Creek and thus to the archaeological potential of the route's northern end. Section 3, which integrates fieldwork results with desk-based studies, looks at more detailed evidence pertaining to various stretches of the proposed route, commencing at the Swale and ending at Brielle Way. Section 4 consists of an assessment of the likely archaeological impacts and effects of the construction project and their significance and Section 5 at ways by which such effects might be mitigated. Section 6 comprises a general summary of Sections 4 and 5 whilst bibliographic references and acknowledgements are listed in Section 7. In addition to a general location map showing the location of sites and other features (Figure 1), the report is accompanied by a reconstruction of the mesolithic coastline (Figure 2), demonstrating the order of magnitude of long-term environmental changes in the region, by a relief map of Sheppey (Figure 3), indicating evidence for its medieval and earlier coast line, and by sundry historical maps or maps based upon historical sources containing topographic evidence discussed in the text.

2 ARCHAEOLOGICAL SETTING

`...the archaeological remains which have been brought to light in the Isle of Sheppey are scarcely worthy of mention.' (Payne 1893, 96)

2.1 General Background

2.1.1 Regional Reports

A recent study of the later geology and archaeology of the North Kent Marshes concluded that the archaeological potential of the area `is as great, or greater than [that] in other wetland areas of the United Kingdom', although the probability of *in situ* prehistoric material in the Sheppey Marshes away from their northern margin was considered relatively low (Barham, Bates & Whittaker 1991, 16, 18-19, 57; but see below, Sections 2.2.1 and 4.3.2). The strategic and economic importance of studying paleo-environmental evidence from the marshes, particularly but not exclusively when in relation to archaeological deposits, has been stressed (*op cit*, 50, 53-55, 59-60; *cf* EH 1996, 2, 4). Recent general assessments of the standing monuments (RCHME 1993, *passim*; RCHME 1996, *passim*) and of the buried archaeology (Brereton 1995, 41-43) of the East Thames Corridor/Thames Gateway development area have highlighted the archaeological potential of Sheppey and both the Thames Estuary and the North Kent Coast have been identified as `areas of particularly high archaeological potential' (EH 1996, 10). Though now almost deserted, both Elmley and Harty have experienced periods of relative prosperity in the historical era (McBride 1987, *passim*). Both these islands, Queenborough and Rushenden flank the Swale which, rather than the open Thames Estuary, was the preferred route for vessels sailing to and from London and the Medway towns as late as the eighteenth century (*op cit*, 4-5). In general terms, study of the archaeology of islands often proves of particular interest as they represent geographically distinct areas with readily defined catchment areas.

2.1.2 Recent Geology

The hills around Minster represent outliers of Eocene London Clay (which also extends under the marshes to the south) and of the Claygate and Bagshot Beds (Barham, Bates & Whittaker 1991, 4-5), capped by Pleistocene Head Brickearth (IGS 1977). The higher parts of Elmley, Harty and Queenborough/Rushenden are also formed by outcrops of London Clay. The courses of the Thames and Medway varied very considerably during the Pleistocene but, when the situation stabilised, erosion of the earlier deposits left a shallow basin between these hills and the Kentish mainland (Barham, Bates & Whittaker 1991, 5-6, 16). The complex and nationally unique Holocene geology of the Thames/Medway Estuary is dominated by considerable changes in relative sea-level (Barham, Bates & Whittaker 1991, 9-10, 57; Brereton 1995, 6-8). As elsewhere in the twin estuaries, the basin would have been subject to alternate inundations (marine transgressions), when alluvial clays would generally have been laid down, and drier periods (regressions), though the former would seem to have predominated in the study area. Though subject to local variation, the general sequence of relative rises and falls in sea levels has been established for the lower Thames Valley (Brereton 1995, 6-7). This work indicates transgressions in the later mesolithic, the early neolithic, the whole of the bronze age, the middle iron age and in the second century AD. The approximate coastline of the Thames Estuary in the earlier mesolithic regression has recently been reconstructed (Figure 2;

Wilkinson & Murphy, *passim*). To the north-west of the study area, near Queenborough, the London Clay drops away dramatically owing to the presence of a paleo-channel of the Medway (Barham, Bates & Whittaker 1991, 8-9, 10; M Bates, pers comm), one cliff-like bank of which may have been located beneath the Hoo peninsular (R Earl, pers comm).

2.1.3 Archaeology on Sheppey

George Payne's dismissiveness of a century ago was based upon absence of evidence rather than evidence of absence.[4] The paucity of finds then known may have been due in part to development in the eighteenth and nineteenth centuries, the heyday of antiquarian research, having concentrated on the archaeologically barren shingle bank at Sheerness. A vicious circle then developed: nothing was found - nothing was sought - nothing was found. Authors of subsequent general histories of Sheppey have tended to follow Payne's assessment for all periods prior to the establishment of Minster Abbey in *c* 675. However casual finds, made chiefly on building sites or by fossil hunters or metal detectorists, have been accumulating gradually over the past century. Various small scale excavations by the Sheppey Archaeological Society (SAS hereafter), Kent Archaeological Rescue Unit (KARU hereafter) and CAT have also contributed significantly to the known assemblage over the last two decades. Meanwhile, the fields of environmental, landscape, building and industrial archaeology have developed: the scope of what may be defined as being of archaeological interest or importance has thus widened appreciably.

2.2 Designated Sites

There are no Conservation Areas located within the study area, although there is one to the north-west of the area which covers much of the town centre of Queenborough, centred upon the High Street. A high concentration of listed buildings are to be found within the centre of Queenborough, the majority of which are within the Conservation Area. There is one listed building within the study area; this is a 18th century Grade II Listed Building located on the Queenborough Road (A249, northside), at Neatscourt. There is one Scheduled Ancient Monument to the north-west of the study area, which covers the historic core of Queenborough and its castle.

There are two sites listed in the Sites and Monuments Record (SMR) maintained by Kent County Council within the study area: the abutments of the original bridge on the east side of Kingsferry bridge, and a saltern group at the intersection with Ferry Road. Another SMR site lies within Queenborough outside the study area. Throughout the report these sites are referred to in terms of the National Monument Regiser (NMR) which is the national database of archaeology sites and buildings and incorporates the SMR. The location of these sites and their NMR reference numbers are shown on Figure 1.

2.3 Overview of the Stage 1 Findings

The results of the Wessex Archaeology desk study were compiled into a project gazetteer which contained a

[4] See quotation at opening of Section 2: Payne excepted Harty from his generalisation.

documentation of all features of archaeological/historic value within the scope of the project and an estimate of the resource value based on three ranking categories:

A - Sites of `high archaeological importance' or potential (known site of national or regional importance);

B - Sites of `medium archaeological importance' or potential (site with the potential to be of local importance);

C - Sites of `low archaeological importance or potential' (site of limited or, at best, local archaeological value).

In summary, the Wessex Report identified that no sites of high archaeological importance/potential were situated within the study area; but three sites of medium archaeological importance were situated within the study Area. However, only one of these is directly affected by the Preferred Option; a group of nine salt-working mounds (salterns) on the Neatscourt/Chetney Marshes, 2 to 4 m spot heights (see Figure 1).

The Ove Arup report concluded, on the basis of information contained within the Wessex Reports, that there would be no areas of High Archaeological Potential or Scheduled Ancient Monuments directly affected within the study area. Overall, however, the Arup report noted that the study area has considerable archaeological potential based on the record of human activity in and around the study area and the likelihood that any remains would likely to be preserved in situ because of the anaerobic conditions that prevail in the marshland. Any route option with an alignment close to the existing A249 would be preferred because this would cause least landtake and severance of known remains (ie, the saltern features) and least disturbance to adjacent areas of archaeological potential.

2.4 Prehistoric Settlement on Sheppey

2.4.1 General

Though relatively few prehistoric finds have been made on Sheppey, this would appear to be due to a poor recovery rate rather than a sparsity of original material (Brereton 1995, 9): it is notable in this respect that the bulk of the known material consists of readily recognisable metal and large flint artefacts. Given the wide range of exploitable resources available in estuarine settings (McBride 1987, 1, 7-8; Barham, Bates & Whittaker 1991, *passim*), it is reasonable to suppose that most of the isolated rises in the North Kent marshes (perhaps including some now buried beneath the alluvium) would have attracted prehistoric settlement during periods of relatively high sea-level, with occupation spreading out into areas now under marsh or mud-flats during regressions. Late Pleistocene or early Holocene land surfaces (equating archaeologically to the upper palaeolithic and mesolithic periods) might be encountered on the northern margin of the Sheppey marshes, dipping beneath the later marshland (*op cit*, 8, 13). It has been suggested that very little *in situ* prehistoric archaeology is likely to lie beneath these marshes (*op cit*, 16, 18-19) however, in addition to well preserved paleo-environmental evidence, there are some important exceptions to this rule. The marshes are likely to conceal prehistoric timber trackways leading to and from the various rises (*op cit*, 34), akin to the bronze age path recently discovered at Greenwich (Philp & Garrod 1994, *passim*) or the

track found at Beckton in Newham (RCHME 1993, 10). More probable still is the survival under the marshes of early boats such as the neolithic(?) dug-out canoe from the Erith Marshes (Crozier 1982, 243) and the undated dug-out from Murston, near Kemsley (Barham, Bates & Whittaker 1991, 32). Prehistoric fish-weirs might also be encountered (see Section 2.4.4). On the Kentish mainland, redeposited mesolithic material was recovered from the medieval site of Castle Rough, near Kemsley (Mills 1973a, 17; *id.* 1973b, 60-61). Mesolithic and neolithic occupation sites near Kemsley and Lower Halstow (Payne 1893, 1-6; National Monument Record (NMR hereafter) TQ 86 NE 3, 8 and 11) and at Motney Hill (R Earl & J Jarvis, pers comm) all lie close to the +5 m OD contour, suggesting that the contemporary margin of dry land, whether adjoining marsh or open water, may have lain close to the early medieval shore-line (see Sections 2.6.1 to 2.6.3).

2.4.2 Structural Evidence from Sheppey

Separate recent excavations by KARU (B Philp & B Corke, pers comm) and by CAT have revealed the presence of prehistoric features at Minster, the earliest perhaps late bronze age in date and certainly no later than the early to mid iron age (Pratt 1995a, 27; Bennett 1994, 463-464). An unexcavated mound above the +10 m OD contour on Elmley has been tentatively identified as a bronze age round barrow, though the interpretation is dubious (NMR TQ 96 NW 17). A second barrow, on Mill Hill, a rise just east of Minster, was reported `near Borstal Hall' (now Gilbert Hall Farm; Woodthorpe 1951, 7). This feature, probably on the site of number 22, Chequers Road, was identified as an Anglo-Saxon burial mound but the attribution is dubious: it may have been a prehistoric tumulus or a medieval windmill mound.

2.4.3 Artefacts from Sheppey

An undated flint axe was found on the shore near Minster (NMR TQ 97 SE 6) whilst a mesolithic flint axe or adze came from `the Thames at Queenborough' (NMR TQ 97 NW 12). A polished flint axe of neolithic date has been recovered from the beach north east of Minster (Kelly 1988, 302) and another from the junction of the Thames and Medway (NMR TQ 97 NW 2). A third polished flint axe, of uncertain date, is provenanced from Sheppey (NMR TQ 97 SE 16). A bronze age palstave has been reported from Sheerness (Grove & Neville Terry 1949, 143-145; NMR TQ 97 NW 1) and another from Minster (NMR TQ 97 SE 2). An important metal-working hoard of similar date was recovered from Harty in 1873 (Scott Robertson 1874, 300; Payne 1893, 97; Daly 1904, 276; Clinch 1908, 322-323; NMR TR 06 NW 3) and a bronze age spear and sickle have also been recovered from the cliffs north of Minster (Philp 1985, 12-13; NMR TQ 97 SE 24). Pottery from the late bronze age or early iron age and from the middle iron age has also been found on Round Hill (immediately north-east of Minster village) and on an SAS site in Minster itself (B Slade & N MacPherson Grant, pers comm). A few sherds of iron age pottery and one from the early bronze age have recently been discovered on adjacent CAT sites on Mill Hill (Pratt, in preparation). On a casual visit in 1993, CAT staff found a mesolithic or neolithic flint scraper and early/mid and late iron age pottery just north east of Harty Church. During Stage 2 fieldwork, Wessex Archaeology recovered a neolithic or bronze age flint scraper from north-west of Wallend Cottages and a sherd of bronze age or iron age from north-west of Neats Court (Fitzpatrick & Seager Smith 1992, 13, 23-24). Three iron age coins, one of the Kentish *Cantiaci* and the others of the East Anglian *Trinovantes*, were found by metal detectorists in or near the Eastchurch area (NMR TR 07 SW 15) and a Gallo-Belgic coin of *c.*55 BC was found near Warden (NMR TR 07 SW 16). An iron age

coin of Syracuse has been reported from Eastchurch (NMR TQ 97 SE 9) and another, from Mytilene, is recorded simply as coming from Sheppey (NMR TQ 97 SE 12). A possible correlation between pre-Roman salt production and imported coins has been noted in Hampshire where, it is proposed, salt may have been traded formally or at least have served as a medium of external exchange (Bradley 1975, 25). Though no prehistoric salt working is yet attested from either bank of the Swale, it would be quite reasonable to suppose that such an industry existed. An object tentatively identified as an iron age currency bar was found on Minster beach (Gidlow 1971, 138; NMR TQ 97 SE 19) and this too might suggest formalised exchange activity.

2.5 Romano-British Settlement on Sheppey

2.5.1 General

In addition to Roman tiles reused in the seventh-century church of Minster Abbey (NMR TQ 97 SE 1), numerous scattered finds of Romano-British material, including pottery, coin hoards, a quern stone, cremations and building debris, have been made on Sheppey.[5] The only solid Romano-British structure yet identified on the island consists of a putative limekiln at Shellness (Payne 1893, 98; Jessup 1932, 128; NMR TR 06 NE 1).[6] The later Roman shoreline was probably not dissimilar to that which can be reconstructed for the medieval period, though it is likely to have extended
somewhat further into the marshes prior to the marine transgression of the second century AD (see Section 2.4.2).[7]

2.5.2 Neighbouring Finds

Perhaps the closest Romano-British finds to the proposed route, all recovered by the writer, comprise a sherd of probably local pottery (see note 26) from an embankment at the eastern end of the tidal pond forming the current head of Queenborough Creek, two sherds of black-burnished ware from fields just north-west of the junction of Barton Hill Drive and the B2231 (at TQ 936 730 and TQ 938 917) and a fragment of *tegula* from the Flatcreek Head saltern (see Section 2.6.2). In addition, Romano-British cremations were found during construction of the main entrance to Sheppey Comprehensive School (now Minster College; NMR TQ 97 SW 11). A Romano-British pottery industry flourished on the neighbouring mainland, in the Upchurch Marshes, until the third century but there is as yet no evidence that production extended on to Sheppey (Pollard 1988, 173-176). The demise of the industry may have been caused by a rise in relative sea level (Waddelove & Waddelove 1990, 258-259, 265).

2.5.3 The Sheppey Scarab

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[5] Detailing all the known Romano-British material from Sheppey, the publication of which has often been somewhat haphazard, lies beyond the scope of this report.

[6] Identified and dated, sometime after its discovery, on the basis of its description.

[7] Research based upon archaeological material has suggested that the aggregate relative rise in sea level in south eastern Britain during the Roman period was about 0.5 m (Waddelove & Waddelove 1990, 265). In support of this, a hut attributed to the late iron age or early Roman period has recently been identified on what are now tidal mudflats near Seasalter (T Allen, pers comm).

An Egyptian scarab attributed to the Ptolemaic or Roman period was reportedly recovered from Sheppey, considerably prior to 1792, at a depth of `sixty yards', together with `a red China plate' (*ie* a Samian platter) and `a piece of gold coin' (*Archaeologia* 1808, 430, pl.XIX.6; NMR TQ 96 NE 10). The implication of the three items being found together is that they were from a burial, though this would hardly seem probable given the recorded depth (which itself suggests discovery during well-digging or off-shore dredging). The report must be treated with considerable caution, even though previous writers have regarded the find as one of the very few authentic scarabs from Roman Britain (Harris & Harris 1965, 91-92; Green 1976, 58, 230).

2.5.4 Salt-working

Briquetage, suggestive of salt production in the vicinity and associated with Romano-British pottery, has been reported from Stanford Hill, near Eastchurch (Kelly *et al.* 1967, 291-292; Miles 1975, 26). Several Romano-British salt-pans, exposed through coastal erosion, have been excavated at Funton Creek, near Iwade (Miles 1965, 260-265; Miles 1975, 27-28; Detsicas 1984, 165-168). Whilst medieval salterns in the north Kent marshes (Thompson 1956, *passim*) and Romano-British ones in
Essex (Fawn *et al.* 1990, *passim*) have left distinct mounds, the Funton Creek examples suggest that any Romano-British salt-making on Sheppey need not have left obvious remains above ground.

2.6 The Medieval Period in the Sheppey Marshes

2.6.1 General

Though lost to erosion along the northern side, elsewhere much of Sheppey's early medieval (and perhaps earlier) coastline may be approximated from cartographic and other sources. The old shore is sometimes visible in the field as a slight but distinct rise in ground level a little below the +5 m OD contour and corresponds roughly with the boundary between London Clay and alluvia marked upon the local geological maps (Figure 3; IGS 1974; IGS 1977).

2.6.2 Salterns

Documentary evidence from fines (Churchill, Griffin & Hardman 1956, 142, 146, 157), comparison with excavated examples at Seasalter (Thompson 1956, *passim*) and sherds recovered by the writer from a damaged mound at Flatcreek Head, just east of the study area, point towards a twelfth to mid-thirteenth century *floruit* for the saltern mounds known locally as `coterells' [8] Though several later fines dealt with marsh and land on Sheppey, no mention of salt pits or of rent paid in salt post-dates 1241. Both the Seasalter and Flatcreek Head mounds appear to have

[8] The medieval term `cote' or `coot' indicates a salt works (Thompson 1956, 44n, 45n; Owen 1975, 43n; McBride 1987, 14; *cf* place names mentioned in Rudkin 1975, *passim*): `coterells' were presumably `cote-' or `coter-hills'.

stood directly upon tidal mudflats and to have exploited the mud itself as a source of relatively concentrated brine.[9] Contemporary maximum high water must therefore have lain between these mounds and the +5 m OD contour (Figure 3).[10] The southernmost Straymarsh salterns appear to have stood farther from the old shore line than most others, suggesting that mud flats had already begun to form along the flanks of the Old Ferry Road. Most surviving saltern mounds appear to concentrate in clusters (for example, those west and north of Straymarsh Cottages) and it may be that these might serve as pointers to the approximate positions of the contemporary local settlements, on the old shore, from which they were worked.

[9] An area of parallel laid twigs or reeds, about 1 m^2 in extent, was also noted within the Flatcreek Head mound, clearly comparable to the mats found at Seasalter, which were probably employed to provide a secure footing on the slippery mud. A small sample of this material is held in deep-freeze at CAT offices.

[10] Saltern mounds in late sixteenth century Lincolnshire lay between the lines of the spring and neap high tides (Rudkin 1975, 37).

2.6.3 Ditches and Counterwalls

Extant drainage channels often lie along, or begin at, the junction of the marsh proper and the slight rise which marks the old coastline. Old counterwalls, erected primarily for land reclamation or flood defence but sometimes also used as communication routes, also tend to die out at this junction.

2.6.4 Fish Weirs

A general class of timber structure which might be encountered beneath the marshes consists of fish weirs. These would tend to have been erected on tidal mud-flats and hence would probably, in this context, be medieval or earlier in date. Large, probably medieval, fish weirs survive on the mainland side of the eastern Swale (M Harrison, pers comm).

2.6.5 Innings

Land reclamation and flood defences in the eastern Swale were the responsibility of the Commissioners of Sewers, whose records are, in this case, very patchy (Bowler 1983, 29n; KFHS 1986, *passim*). The corporation of Queenborough was responsible for similar work along the western Swale (KFHS 1985, Introduction) and the relevant records, included in the municipal papers, would also appear to be rather haphazard. The Calendar of Patent Rolls includes ten commissions `*de walliis et fossatis*' (ie for construction or repair of counterwalls and dykes) for Sheppey, all within the period 1377 to 1478 (McBride 1987, Figure 1), though at least one of these was probably concerned with repairing the Old Ferry Road rather than flood defences (see Section 3.3.2). One of the earliest overall maps of Sheppey, Elizabethan in date, is concerned chiefly with land tenure but shows a pair of `Old Bulwarks' (Figure 5; BM Cat. 1844, 100 (Cotton MSS, Aug.I.i, 51); reproduced Oppenheim 1926, facing 306),[11] though these probably represent earlier forts rather than counterwalls.[12] Though a tentative sequence has been proposed for the counterwalls around Elmley (McBride 1987, 15, 16, map 4, Figure 1), detailed fieldwork and primary documentary research, beyond the scope of this report, would be required to elucidate the history of the medieval and post-medieval inning of the Sheppey marshes, but paleo-environmental and pedological research could provide useful indications.

[11] This may have been drawn up to accompany the survey commissioned of Lord Cobham, Sir Edward Hoby and others in 1585 or that by Hoby in the previous year (BM Cat.Add. 1925, no 38823 (18)).

[12] There was a blockhouse at Sheerness by 1547 (Oppenheim 1926, 284; Colvin *et al.* 1985, 478).

2.7 Sites Neighbouring Queenborough Creek

2.7.1 Medieval Queenborough

Edward III expunged a hamlet, probably of Anglo-Saxon origin, named Bynne and, in its stead, founded the town of Queenborough (*Burgus Reginae*) on the 10 May, 1368 (Woodruff 1897, 170-2; NMR TQ 97 SW 17).[13] The last new town founded in England until the early seventeenth century (Beresford 1967, 457),[14] it was probably intended to attract the level of population required, as militia (Whitehead 1974, 104), to supplement the garrison of the new castle, also built by Edward, in case of attack. Building work on the town pre-dated the charter however and the accounts were included with those of the castle from 1366 onward. By 1362 work had begun on a new mill, *propre castrum* and *juxta castrum*, at which ships unloaded cargoes of wool. One document refers to it as a water mill (Allen Brown, Colvin & Taylor 1963, 794n), presumably worked by tidal power. In July 1368 Queenborough replaced Sandwich both as the staple wool port for all the coast from Winchelsea to Gravesend and as a centre for the collection of cloth duty. These spurs to the town's development survived Edward by only a few months, lapsing in January 1378 (Beresford 1967, 458-9). The street plan and property boundaries still reflect the lines of the fourteenth century settlement, but the only standing medieval structure to survive is the Grade II listed church (NMR TQ 97 SW 3), originally of St James when built in 1366/7, but rededicated to the Holy Trinity in the fifteenth century (Hughes 1991, 551).

2.7.2 Queenborough Castle

The design of Queenborough Castle (NMR TQ 97 SW 1, Scheduled Ancient Monument (Kent) 185), described as `so advanced as to be unique' (Allen Brown 1954, 93), has attracted the admiration of at least one modern professional military engineer (Whitehead 1974, 104). The concentric plan `was almost the earliest example of the fort, in the modern sense' (Clapham 1913, 274). The moated outer wall was pierced by a main gate, flanked by towers, to the west and by a small, diametrically opposed, postern. The castle's centre is still marked by its well, surviving under a concrete capping on Castle Green, but its orientation is uncertain. The main gate probably faced the junction between High Street and North Road but it may instead have been aligned on either of two short streets leading down to the creek. The survey of 1773 (Figure 6; Hull 1973, 125 (CKS U38 O3)) supports an alignment on the High Street in so far as it indicates a distinct widening of the moat in this direction. The castle was built on land acquired from the Manor of Rushenden in August 1361 (Beresford 1967, 458) but the work force was being recruited as early as February of that year. It was provided ostensibly `for the defense of the realm and for the refuge of the inhabitants of the island' (Daly 1904, 85; cf. Lambarde 1570, 227). However, it is possible that this isolated castle may also have been intended as a royal refuge from any repetition of the Great Plague of 1346-8.[15]

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[13] The earlier name may derive from Old English *byn* which can be interpreted as `some sort of swelling of the ground' (Wallenberg 1931, 348). A variant of the name appears in a late eleventh century rental known as the *Consuetudines de Newenton*, which refers to `twenty eight weys of cheese from Sheppey and *Binnen ea*' (Du Boulay 1966, 176): like `-ey', the second element indicates an island (see note 1).

[14] Queenborough was the only new foundation between Bala (1310) and Falmouth (1613; Beresford 1959, 212).

[15] The *pestis secunda* appeared at Florence in 1359 and reached Poland the following year (Creichton 1984, 203): in May 1361 it resulted in the demise of `a great multitude' in London (Shrewsbury 1971, 128). Perhaps of more immediate concern to the king, Henry Duke of Lancaster (his own cousin and John of Gaunt's father-in-law), had already been similarly struck down at Leicester in March (Creichton, *loc cit*). It may

At least two houses were demolished to make way for the castle and the occupants rehoused (Beresford 1967, 459). The king was probably present at the commencement of work, which eventually cost over , 25 000, about half the amount spent on Windsor, itself the most expensive single royal medieval building project in England (Allen Brown, Colvin & Taylor 1963, 162-163). As the relevance of the Swale as a shipping route waned, so too did the importance of the castle until it was declared obsolete by the Parliamentary Commissioners in 1650 (PRO Surv., 52) and rights to at least part of its fabric sold by the town mayor (Milne 1895, 174). It was demolished shortly thereafter and its loss was sorely felt when the Dutch took Sheppey in 1667. The well was re-opened and deepened in 1725 by order of the Commissioners of the Navy and was maintained by the Victualling Board until 1829, when it passed to the Royal Engineers who put it into the charge of the Corporation of Queenborough (Pratt 1991, 8). With the advent of the railway, the easternmost limit of the castle's outer circuit was overlain by the line to Sheerness, a second well was sunk next to the original and a well house, now demolished, was erected by the railway company in about 1868 (Kelly 1938, 606).

2.7.3 Enclosures

In addition to the castle and to a small, irregularly planned `camp' excavated by KARU and noted in the Wessex report (Cherry 1978, 181; Fitzpatrick & Seager Smith 1992, Figure 2, Cat.no.IQ 3; NMR TQ 97 SW 2), a large rectilinear earthwork, over 250 ft by 350 ft, lay a little north of a bend in the creek, under the modern housing along Gordon Street and Harold Street. The banks which formed it are marked on OS 1869 (though it had disappeared by the time of OS 1898) and a measured sketch plan of the already destroyed earthwork, together with that of the smaller `camp' and the site of Queenborough Castle, has been published (Chalkley Gould 1908, 409; *cf.* Figures 13 & 14). The dates of both earthworks are unclear, though the location of the smaller off the old shoreline and the discovery of masonry footings within suggest a mid-thirteenth century or later date. The plan of the larger structure might suggest a Romano-British or late Anglo-Saxon fort or a Viking[16] camp but a medieval `industrial' role appears more probable. Since 1904, various local historians have written
of an Anglo-Saxon precursor to Queenborough Castle but without presenting any evidence for such a site.

2.7.4 Possible Functions of the Rectilinear Earthwork

In the case of a military function, the position of the larger earthwork, on the low-lying landward side of the slight rise on which Queenborough stands is directly comparable to that of the fourteenth century royal castle. Such a

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also be significant that Queenborough Castle was unusual in being a royal commission: medieval fortifications were more frequently erected by private individuals or corporations (Saunders 1970, 201). If the castle was indeed intended as a refuge, its position would have been exceptionally well suited to the role, on an isle within an isle and a simple boat ride from the capital, with no need to touch shore until virtually at the gate. Edward III was a frequent visitor to Queenborough, going as far as to appoint a Keeper of the Privy Wardrobe there (Allen Brown, Colvin & Taylor 1963, 693). Whatever the building's original purpose, Henry IV stayed at Queenborough during an outbreak of the plague at London in 1406 (Tyler 1994, 55).

[16] The Vikings first over-wintered on Sheppey in 855 AD (corrected date, Garmonsway 1972, 66-67). They would probably have sought sheltered waters with a shallow sloping shore to draw up their ships. The best candidates for such a site are Capel Fleet, Windmill Creek and Queenborough Creek. However, slightly less sheltered coastal sites such as the embayment near Neats Court cannot be excluded. Milton was fortified by Haestan the Dane in 892 (*op cit*, 84-85). Milton and Sheppey were raided by Earl Godwin and Harold in 1052 (*op cit*, 180). Fortification of Queenborough might be expected around any of these dates.

position, rather than on the relatively commanding heights of Rushenden overlooking the Swale, might suggest a particular concern with the more or less canalised creek and the protected anchorage it could afford. Several possible `industrial' interpretations also present themselves: oyster pond,[17] saltern (though not employing the same method as the coterells), fresh-water catchment (see following paragraphs) or tidal mill pond. Some form of harbour installation might also be a feasible interpretation, though less likely given the feature's distance from the extant creek.

2.7.5 Medieval Evidence for Water Catchment

Although some spring water was available in the north-eastern part of Sheppey, fresh water was generally in short supply (Hasted 1798, 209; Studt 1991, 2). Therefore, in 1361, Edward III ordered that `In a place called Bynne rainwater falls and is received by the Swale. Licence is granted for the prioress to make four dykes, furrows or baulks with a plough, the width 3 feet 20 poles round the well for the water to run in. The water may be carried by ships' boats, carts, horses *etc.* and they may come and go as they please by the causeway which leads to the castle' (Judge 1983, 55; *cf* Tyler 1994, 53 and Studt 1991, 2). The meaning of the second sentence is rather obscure but may refer to some form of water catchment. The 20 poles mentioned in the document equate to a little over 100 m whereas the castle well, at the centre of the small inner court, lay over 200 m from both the earthworks.[18] Prior to the well's construction, the inhabitants of Queenborough had drawn their water from a pool near the castle (possibly artificial, site unknown) known as Foxlegore, after the castle's first Constable, Foxle (Favresfeld 1913, 153). The need for the well was highlighted when flooding contaminated the pool with salt water in 1376 (Allen Brown, Colvin & Taylor 1963, 799).

2.7.6 Seventeenth Century Evidence for Water Catchment

The Queenborough Chamberlain's accounts for 1653 include the following entries (Woodruff 1897, 177):

	£	s	d
To Vile for clearing the well		3	0
" for setting up the cesterne		10	0
" for makeing a waterside place at the great pond	1	0	
For cleaning the well and mending the hoope of ye bucket	1	16	0
For cleaning the pond	4	15	0
To John Siborne for a rope	2	16	0
To Smith for his work about the bucketts	1	13	0

[17] The oyster industry formed the mainstay of Queenborough's economy from at least the medieval period into the nineteenth century.

[18] The earliest recorded work on the castle well dates to 1365 (Allen Brown, Colvin & Taylor 1965, 797), though its site was probably determined at the commencement of building work in 1361.

The payments would appear to relate to a general programme of work following the demolition of the castle and the well's acquisition by the Mayor and Burgesses. Whilst the pond(s) to which reference is made may have held salt water, the context clearly implies that they were for fresh water.

2.7.7 Other Features

OS 1869 shows a set of four large irregular features just south east of the rectilinear earthwork.[19] The three more westerly are water filled whilst the easternmost is shown as marsh. The western pair are in the form of two very rough, elongated ovals, the eastern of opposed crescents or sigmoids. The long axes of all four lie parallel to each other and orthogonal to the creek. Though possible interpretations for the two oval features would include harbour installations, oyster ponds, salterns and tidal mill ponds, the crescents give the distinct impression of being formed from an `ox-bow lake', caused by the isolation of a former meander in the course of the creek (similar meanders still survive in a narrow `fleet' north of Queenborough). A survey of 1773 shows several inlets into this area from the creek (Figure 6; Hull 1973, 125 (CKS U38 O3)), suggesting that the northern counterwall had not yet been built. The construction of this wall would have forced the creek, and hence the civic boundary, into a more southerly route, effectively increasing the land area claimable by the borough.

2.8 Summary and Scientific Value of Sites

2.8.1 The Prehistoric Period on Sheppey

Relatively few prehistoric finds have been made on Sheppey but they are sufficient, together with assessments of the economic potential of the paleo-topography and paleo-environment and comparison with neighbouring mainland sites, to suggest that higher ground at least was settled during marine transgressions in the mesolithic, neolithic, bronze and iron ages with correspondingly more extensive occupation during regressions. Though the general pattern of sea-level fluctuation has been studied for the lower Thames, local variations are unpredictable and ill-dated: more detailed geological and paleo-environmental fieldwork would be required to clarify the local sequence. In addition, prehistoric timber tracks, vessels or fish-weirs might be encountered in the marshes and upper palaeolithic and mesolithic land surfaces may survive on their northern margin. It is possible that there may have been a salt industry on Sheppey during the iron age and artefactual evidence suggests a relatively high level of overseas contacts in this period. Any well preserved vessels of this period, or any direct evidence for a significant trading centre, are likely to be considered of national or international importance, tracks of national or regional importance. Other finds of this period would probably be assessed as being of only local or regional importance but might be upgraded, especially considering the high potential for paleo-environmental study.

2.8.2 The Roman Period on Sheppey

Though contemporary structures are all but unknown, much Romano-British material has been recovered from

[19] Modern landscaping has obscured these features.

Sheppey, though it is uncertain how far into the marshes occupation may have extended. Several Romano-British salt-pans are known from the neighbouring mainland and a pottery industry was centred in the Upchurch Marshes: neither industry left visible remains above-ground though salt-working sites are particularly likely to lie beneath the Sheppey Marshes. Industrial features of this date would probably be of regional importance, vessels nationally important.

2.8.3 The Medieval Period in the Sheppey Marshes

The coastlines of Elmley and Harty and the southern coastal margin of the Minster/Leysdown hills in the early medieval period may be approximated from various sources. These were flanked by twelfth to thirteenth century salt-working mounds, originally constructed on tidal mudflats, which now stand out in the marshes. Counterwalls of various date also cross the marshes and fish-weirs may also survive here. Earlier medieval counterwalls and causeways should probably be assessed as being regionally important and later ones might also deserve similar treatment. Depending upon their degree of preservation and complexity, saltworking complexes of this period would probably be locally or regionally important but could, in exceptional cases, receive attention at a national level.

2.8.4 Sites Neighbouring Queenborough Creek

There is evidence for a complex and evolving historical landscape from the mouth of Queenborough Creek to the present roundabout. Though no prehistoric material has yet been identified from them it is quite likely that Rushenden and/or Queenborough were occupied from at least the bronze age. In this case wooden tracks may have been used to reach the respective rises from Doos Hill or Barrows Hill. The Anglo-Saxon hamlet of Bynne is likely to have had some form of communication with the Minster/Leysdown hills, if only from the seventh century foundation of the Abbey, and this may well be represented by the slight embankment on which the current road lies. Use of this causeway may have been controlled in some manner and a keeper's house might have stood here. Queenborough itself was a new town, founded in the fourteenth century on the site of the hamlet. A major royal castle of unique design (demolished *c.*1650) was erected at the same time and the town was equipped with a tidal mill. A large rectilinear earthwork just outside the study area may have been military in origin and might indicate Viking or late Anglo-Saxon defence of the inlet or it may mark a medieval `industrial' site. A smaller, probably medieval, earthwork lay to the north. The southern counterwall may be Anglo-Saxon but a medieval or early post-medieval date is also likely. The creek was finally fully canalised in the late eighteenth or early nineteenth century up to the cross-wall, which must have been built at the same time. At least two of four large sunken features, also just outside the area, were probably meanders cut off by the canalisation whilst the others may have a similar origin or represent harbour or `industrial' installations, probably of medieval or early post-medieval date. Two slighted mounds, one outside and one on the margin of the area, may have been medieval salterns or remnants of a counterwall but other interpretations cannot yet be discounted.

3 SITE SPECIFIC ARCHAEOLOGY AND HISTORY

3.1 King's Ferry

3.1.1 Tremhethe on Capel Fleet

There has been some confusion regarding the location of `Tremhethe' (with variants), an Old English name indicating a timber landing place (Wallenberg 1934, 391): as this bears upon the history of Kingsferry, it is proper to include an explanatory note. The name appears in documents as early as 1240 and an Assize of 1292 refers to a `*pons de Thremheth(e) int' insulas de Scapeya & Herteya*' (Wallenberg 1934, 251). This bridge was destroyed during a storm or flood and replaced by a ferry (Hughes 1994, 6). Evidence discussed above (Sections 2.6.1 to 2.6.3) suggests that Capel Fleet, separating Harty from the Minster/Leysdown hills, was between 1 km and 1.5 km in width in the twelfth to thirteenth centuries. It is difficult to interpret the Assize document in any way other than as referring to a bridge and/or causeway (perhaps interrupted by a short ferry crossing) traversing this channel, though it is possible that other thirteenth century occurrences of the name could refer to the Swale crossing from Iwade.

3.1.2 Trinhide on the Swale

A ferry, which would appear to be that at Kingsferry, is referred to in the accounts of Edward III in the 1360s (Allen Brown, Colvin & Taylor 1963, 800; Judge, 1992, 494). In 1401, Henry IV granted the right to levy a `Ferry Cess' in order to maintain both ferry and road (Judge 1992, 394). The earliest surviving written account of the Ferry Court, which sat at Kingsborough in 1546, refers to `Trinhide Ferry' whilst the next records it as `Trinhide, alias the King's Ferry', the earliest known use of the latter term (Judge 1983 30; Judge 1992, 495-497). The Ferry Court continued to administer the affairs of `the King's Ferry' up to 1857, after which control of the crossing passed to the Sittingbourne and Sheerness Railway Company (Judge 1980, 297) although the ferry was still employed until the first lift-bridge, erected in 1859 to 60 and lying east of the current crossing, was opened to road traffic in 1862 (Judge 1983, 31; Judge 1987, 453-454) (NMR TQ 96 NW 63). Published documentary sources would thus seem to support the view that two separate crossings were, perhaps at different times, referred to with identical or very similar names, probably with the same etymology (which suggests origins for both in the Anglo-Saxon period or earlier).

3.2 Ferry House

3.2.1 Medieval Period

In 1367 John Roseacre, who worked on the building of Queenborough Castle, contracted to erect a ferryman's house (Allen Brown, Colvin & Taylor 1963, 800), presumably at Trinhide. It is not certain which side of the Swale this was built.

3.2.2 Early Post-medieval Period

A plan of Sheppey drawn up around 1572 by `I.M.' shows a building marked `Kings ferre' on the Sheppey bank and a row-boat in the Swale (Figure 4; PRO Cat. 1967, no 1291 = MPF 240; reproduced Harvey 1993, pl.II). Another Elizabethan map of Sheppey marks `Kyngsfery' with a small circle, also on the island bank (Figure 5; British Museum, Cotton MSS, Aug.I.i, 51: reproduced Oppenheim 1926, facing 306). A Ferry Court Order of 1596 instructed the warden `to make survey of the ferre howse and lands belonging to the ferre on thisside' and to `tryme and dresse the botes and fferre howse on this side' (Woodruff & Woodruff 1902, 292). As the Court sat at Kingsborough, near Minster, `thisside' clearly refers to the Sheppey bank. However, it is curious that any need was felt to make such a specification and the Warden or Ferrymen may have maintained another building on the mainland bank, perhaps unofficially and for their own convenience.[20]

3.2.3 Later Post-medieval Period

A two inch to one mile eighteenth century map (Figure 9; Andrews, Dury & Herbert 1769, sheet 8) shows one building at the mainland end of the ferry, on the south-east side of the road, and another in a small enclosure on the Sheppey bank on the opposite side of the road. A smaller scale map of the Hundreds of Teynham and Middleton, which shows the same arrangement, is probably based upon the earlier survey (Figure 10; Hasted 1798, facing p.308). A small stone house is recorded as standing on the mainland side of the crossing, on the site where one George Fox put up a shelter whilst waiting overnight for the ferry (Hasted 1798, 210; Turmine 1843, 4). Though rather indistinct, Mudge's 1801 one inch survey of Kent, generally regarded as the first Ordnance Survey map (OS 1801 hereafter; Figure 11), appears to show a small building on the north-western side of the road on the Sheppey bank of the Swale and nothing on the mainland bank. The somewhat clearer 1819 one inch Ordnance Survey (OS 1819 hereafter; Figure 12) repeats the information of the 1769 map and adds one or two buildings in another enclosure on the mainland bank, north-west of the road and marked as `Ho.'. An 1879 electrotype edition of this map (reproduced, undated, in Hull 1980, map 13) expands this label to `Ferry House'. In 1843 there was, on the Sheppey side of the crossing `a house licenced [*sic*] as a victualling house, in which the ferry-keeper resides: the house upon the opposite side [was] a victualling house called the `Lord Nelson" (Turmine 1843, 4). In 1847 it was reported that `King's Ferry is crossed by means of a cable 140 fathoms long.....two of the men live on [the Iwade] side of the water to assist in working the boats' (Bagshaw 1847, 521).[21] The *Lord Nelson* was demolished when the current bridge was built (Judge 1980, 297). The site of the building shown on the Sheppey bank on the eighteenth and nineteenth century maps appears likely to have been the site of the ferry house in the sixteenth century also and probably lies beneath the current road: its enclosure would not appear to extend as far north as the proposed route.

3.3 Old Ferry Road

[20] That a ferryman lived on the mainland shore is implied in Act IV, Scene 2 of the disputed play `Arden of Feversham', based on an actual murder case and first published in 1592 (Bullen 1887, 70). However, this was a dramatic necessity for an encounter in the following scene and should obviously not be taken as firm evidence. The crossing from Harty to Oare on the mainland was probably manned by two ferrymen in the nineteenth century, one living on each side (McBride 1987, 36, table 4): a similar situation may have obtained at the King's Ferry.

[21] The entry continues: `The *Dart* vessel Coast Guard Station is situated here'. This would refer to one of the Coast Guard Cutters which, alongside the Coast Watch and Coast Riders, guarded against both would-be invaders and smugglers: the latter were probably the principal concern in the Swale at this date (R Larr, pers comm).

3.3.1 Origins

Place-name evidence (Iwade, Trinhide and, perhaps, Cowstead)[22] suggests an Anglo-Saxon or earlier date for the original road on to Sheppey, which may itself have rested on an earlier (prehistoric?) timber trackway. The nuns of Minster Abbey (founded *c.*675 AD; de Gray Birch 1872, 5, 94) would almost certainly have required a reasonable route to the mainland and, at least initially (whilst enjoying royal patronage), would have had the means to build or maintain one.

3.3.2 Medieval History

In the 1360s, Edward III ordered the widening of the existing four foot wide trackway from the ferry to `Cothelles' to thirty foot (Judge 1992, 494) and had a house built for the ferry's `janitor' (see Section 3.2.1). The road would have been embanked and perhaps flanked by one or two ditches.[23] As noted above, in 1401 Henry IV granted the right to levy ferry tolls, part of which went to maintaining the road, which was repaired or further improved `from Tremcodferye to Cothelles' in 1402 (McBride 1987, Figure 1) and 1406 (Tyler 1994, 55): the work of 1406 may have been rendered necessary by widespread flooding in 1404 (McBride, *loc cit*).

3.3.3 Line of the Road

A counterwall running parallel to part of Old Ferry Road, on its north western side, probably represents the medieval(?) inning of Neatscourt Marshes and appears to define the farther side of an old creek.[24] With the unlikely exception of this embankment, the line of the Anglo-Saxon or medieval road can hardly be other than that of Old Ferry Road. This, replaced by the A249 when the current bridge was built *c.*1960, meandered across the marsh from Kingsferry to the coterells (ie, `Cotehelles') near Straymarsh Cottages.[25] The sinuous line adopted may have followed the side of the early creek or have wound from one slightly higher spot to another in the marshes or mud-flats which it crossed, the creek then forming alongside it.

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[22] Meaning, respectively, `crossing-place' (Wallenberg 1931, 257), `timber landing-place' (Wallenberg 1934, 391) and `rounded-' or `swelling-place' (*op cit* , 231, 236). However, Wallenberg suggests that Cowstead on Sheppey may be an inherited manorial name rather than based upon local topography.

[23] The road was sometimes referred to as the Ferry Wall (Judge 1980, 296).

[24] The south-western end of this earthwork appears to have been obliterated by the current road's construction around 1960.

[25] And thence on slightly higher ground to the tellingly named Wallend Farm. A small-scale eighteenth(?) century map (Figure 8; Judge 1990, 162), a survey of similar date (Figure 9; Andrews, Dury & Herbert 1769, sheet 8) and OS 1801 (Figure 11) show that the route continued on along the line of Barton's Hill Drive, over Rape Hill to Minster. According to OS 1801, there was also a track running almost directly from Cowstead Corner to Elmley. The most northerly part of this route would appear to lie beneath the current road. Its central portion is shown as continuing south, passing east of the site of Straymarsh Cottages, to rejoin the existing bridlepath to Elmley at TQ 933 699. Field drainage patterns are not consistent with this part of the route and there is no visible surface evidence for it. In contrast, the map of 1769 shows the central section following the bridlepath immediately south of Straymarsh Cottages and is probably, in this case, more reliable. Neither the 1769 map nor OS 1801 are entirely accurate however. For instance both maps label buildings along Wards Hill as `Minster Abbey' whereas the Abbey had been sited in the middle of Minster village, a fact which was certainly common knowledge.

3.4 Kingsferry to Straymarsh Cottages/Wallend

3.4.1 Late Anglo-Saxon Period Military Engagement

Edmund's army fought that of Canute and pursued it onto Sheppey in 1016 (Garmonsway 1972, 151). The precise position of this action is not known but the vicinity of the old road would be a logical area in which to expect to find any material lost during the pursuit.

3.4.2 Salterns

In addition to the possible presence of unobtrusive prehistoric or Romano-British (see Section 2.5.4) or of razed medieval examples, this stretch of the proposed route impinges upon two medieval saltern mounds (Fitzpatrick & Seager Smith 1992, Figure 2, Cat.nos. IQ 11/100, IQ 11/101 and IQ 11/107; part of NMR TQ 97 SW 7). The first of these lies just outside the landtake whilst the others extend a few metres into it. Several other mounds form part of the same cluster but lie beyond the corridor likely to be affected by it.

3.4.3 Fossilised Creek

This stretch of the proposed route obliquely crosses the probable site of an old creek bounded on one side by the Old Ferry Road and on the other by a parallel counterwall. The creek may pre-date the road or have formed as a result of changes in the drainage pattern resulting from the causeway's construction. In the latter case, earlier archaeological deposits may well have been eroded away from its bed. The creek itself is now represented only by a small ditch, generally artificially regularised (probably in the modern era).

3.4.4 Other Drainage Channels

Where the counterwalls meet the slight rise up to Cowstead Corner, the edge of the marsh is marked by a sinuous east - west ditch. This may have originated with the inning of the marshes but it will have been subject to constant recutting until the modern-day. Other existing ditches crossed by this stretch of the proposed route all appear to be modern in origin. Lost late medieval or post-medieval drainage ditches might be encountered elsewhere along this section.

3.5 Straymarsh Cottages/Wallend to Neats Court

3.5.1 Topography

This area consists largely of a fairly level outcrop of London Clay, straddling the +5 m OD contour, separating Neatscourt Marshes and Cheyney Marshes. An old shore line can be made out, flanked by salterns on its seaward margin and with a slight embayment on the western side. A geological survey suggests that there may have been a small inlet just south of Neats Court (IGS 1977). Part of the Old Ferry Road runs roughly along the eastern margin of the promontory and a perfectly straight public footpath along its spine. OS 1801 shows a spur of the old road running to Cowstead Farm, more or less on the line of the current road, but does not show the footpath, which does appear however on an Ordnance Survey map of 1869 (OS 1869 hereafter; Figure 13). The old shore line may represent Late Pleistocene or early Holocene land surfaces (Barham, Bates & Whittaker 1991, 8, 13).

3.5.2 Possible Medieval Site

A casual visit by CAT staff in 1991, after the field was freshly ploughed, revealed the presence of probably thirteenth century material in the south-eastern part and of post-medieval(?) pegtiles in its north-western part. Only two sherds of pottery were found but it should be borne in mind that no systematic field-walking was undertaken. The quantity involved is not inconsistent with nightsoil being spread on the field but it is possible that there may have been a medieval homestead between Wallend and Neats Court. This location, close to the Sheppey end of the causeway across the marshes, is one which may well have attracted occupation in any period. Such a settlement, rather than Wallend, might have been the focus for working the Straymarsh cluster of salterns. The relevant plots were not subject to detailed fieldwalking as part of Wessex Archaeology's Stage II work as they were then (and remain) under pasture.

3.5.3 Neats Court

In the late fourteenth century John of Gaunt acquired Neats Court (Grade II, Listed Building Number TQ SW 12 151), possibly the original *chef lieu* of Rushenden Manor, which passed on to his son Bolingbroke, later Henry IV (Tyler 1994, 7). The manor of Neats Court formed part of Charles I's dower to Henrietta Maria and was leased to Sir Edward Hales after the Civil War (Daly 1904, 196-197; Tyler 1994, 11). The Duke of York stayed there whilst inspecting Sheerness Dockyard in 1669 and perhaps again, as James II, whilst waiting to take ship to France from

Elmley during his first bid to flee the country in 1688 (Tyler 1994, 12-13). The manor remains part of the Crown Estates. Subsidiary structures associated with the medieval and post-medieval site of Neats Court may be expected in the area south of the current road, though these are unlikely to be of major archaeological significance. Various plans of the then extant and proposed new buildings at Neats Court and of the estate were prepared in 1776 (PRO Cat. 1967, nos 1232-1235, esp. 1234). A late nineteenth century Ordnance Survey (OS 1898 hereafter; Figure 14) indicates the presence of a rectangular enclosure on the line of the proposed route, lacking in earlier plans (Figures 7 & 13; PRO Cat. 1967, no 1234 = MPE 369; OS 1869). A sheepfold (Fitzpatrick & Seager Smith 1992, Figure 2, Cat.no. IQ 8), first marked on OS 1869 and probably late eighteenth or early-mid nineteenth century in date, still survives about 150 m south of Neats Court, next to a sheepwash fed by a pond. It is possible, but uproven, that there may have been an earlier structure on this site.

3.5.4 Modern Earthworks

A very regular earthen embankment running south from the current road opposite Neats Court does not appear on any OS plans consulted up to 1974, nor do any field boundaries respect it. It is clearly modern, associated with the imported-car depot into which it runs. A small corner of a field isolated by this earthwork has a corrugated surface owing to modern working.

3.5.5 Drainage Channel

A slightly sinuous ditch runs south from the Neats Court sheep wash and sheep fold (Fitzpatrick & Seager Smith 1992, Figure 2, Cat.no.IQ 8) along the small inlet noted above (Section 3.5.1). This may have been natural in origin but has probably been subject to frequent recutting until the modern-day.

3.6 Neats Court to Old Counterwall South of Queenborough Roundabout

3.6.1 Topography

West of Neats Court, the old shoreline approaches almost to the modern (and probably ancient) road in a slight embayment. There is, however, a margin up to about 50 m wide sloping very gently down from the current road to the level of the marsh. The western limit of this area is marked by a zig-zagging embankment (see Section 3.7.1). The main proposed route here lies entirely within the low-lying marshland.

3.6.2 Drainage Channels

This stretch of the proposed route crosses two drainage ditches, running roughly north-east to south-west. The more easterly is slightly sinuous and, though probably often re-cut, may be of some antiquity, the other is straight and, like the east - west ditch which it meets, is likely to be relatively recent. Lost late medieval or post-medieval drainage ditches might be encountered elsewhere along this section.

3.7 Old Counterwall South of Queenborough Roundabout to Brielle Way

3.7.1 Earthworks

A considerable earthen embankment zig-zags west from the current A249, eventually forming the southern bank of Queenborough Creek. A roughly parallel stretch of counterwall is shown on OS 1869 and OS 1898 (Figures 13 and 14), forming part of the creek's northern bank to the west. The latter earthwork is now largely obscured by landscaping but a short cross-wall connecting its eastern terminal with the southern bank still forms the easternmost limit of the tidal ponds which lie in that part of the earlier creek cut off by the construction of the railway *c.*1859.[26] A marked deviation in the line of the southern wall immediately west of this junction suggests the deliberate widening of the tidal area or an echo of a natural meander but it is possible that the eastern part of the counterwall originally turned slightly to run on to Rushenden and that the western part is a later addition to contain the creek. An estate plan of 1776 indicates a field boundary which follows precisely the line of the southern counterwall from just west of the widening to a little short of the current A249, indicating that this portion of the wall was already in place at that time (Figure 7; PRO Cat. 1967, no 1234 = MPE 369). However, the very eastern extremity of the wall, on the sloping ancient shore rather than the marsh, is lighter in construction and is not marked on the early Ordnance Surveys. This part coincides with a modern property boundary and may be twentieth century in date. OS 1869 and OS 1898 (Figures 13 and 14) show the presence of two large mounds, no longer readily discernible, just west of a ditch running north from the cross-wall and perhaps representing medieval saltern mounds.

3.7.2 Ancient Creek Head

The land east of the cross-wall (bounded by the southern counterwall, Main Road and the old coast line just west of the A249) is currently marshland. This area lies much lower than the tidal reach and at least part must have been inundated prior to the cross-wall's construction. The area must contain the ancient creek head which, given its proximity to the Anglo-Saxon and medieval sites at Queenborough, may have served as a harbour. However, a borehole showing silts here at depths of 16 m is probably to be explained by an overall sudden drop in the London Clay in the vicinity of Queenborough, attributed to the presence of an ancient branch of the Medway Estuary (see Section 2.1.2). Two maps drawn up in the 1770s indicate that the creek then extended beyond the site of the cross-wall (see following paragraph). One of these maps (Figure 6; Hull 1973, 125 (CKS U38 O3)) shows the creek as overflowing its northern bank immediately upstream of the constriction where the Queenborough-Rushenden road crossed the waterway. This constriction would certainly have rendered navigation further upstream impracticable and it is tempting to identify it as the site of the tidal mill constructed in the fourteenth century, though other possible sites are noted elsewhere in this report.[27]

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[26] In 1995, during a field visit arranged with Mott MacDonald, the writer recovered an abraded sherd of Romano-British pottery (second or third century, probably a local sandy ware) from the junction between the southern wall and the cross-wall, though this is clearly residual.

[27] From 1362, Edward III's accounts refer to a new water mill, near to the castle, at which ships unloaded cargoes of wool (Allen Brown, Colvin & Taylor 1963, 794n). Such a mill here would, of necessity, have been tidal and may have utilised either an entirely artificial retention pool or a dam or weir across the creek.

3.7.3 Extant Drainage Channels in the Creek Head

A slightly crooked ditch runs north of and parallel to the southern counterwall. Its eastern end runs into another ditch, at the junction of the London Clay and alluvia, which runs south east from Barre's Gate (see Section 3.7.6). A third ditch runs between the cross-wall and Barre's Gate. The first ditch runs into the third close to the cross-wall. The municipal boundary, fixed by Edward III's charter, is shown on OS 1869 and OS 1898 (Figures 13 and 14) as running along the second ditch, then turning to follow the first and the southern end of the third and thence seawards along the centre of the main channel of the creek. That the boundary followed the first ditch rather than the counterwall suggests that either the counterwall post-dates the original charter or the waterway was more prominent in the fourteenth century. The third ditch appears as a boundary of Queenborough Green on a survey of 1773 by Francis Baker (Figure 6; Hull 1973, 125 (CKS U38 O3)). An estate map of 1776 shows the first ditch, serving as a field boundary, whilst the south western part of the third was much wider and clearly still part of the creek: the north eastern limit was not shown (Figure.7; PRO Cat. 1967, no 1234 = MPE 369). The first and third ditches probably now represent all that is left of the landward end of the creek whose full extent, it must be emphasised, is as yet unknown. The new junction will affect the northern ends of the second and third ditches whilst the proposed road will cut across the first and much of the intervening land.

3.7.4 Old Shore Line

The old shore line forms the north-eastern boundary of the low lying area representing the old creek head. In addition to the possible presence of associated features above it, Late Pleistocene or early Holocene land surfaces might survive here (Barham, Bates & Whittaker 1991, 8, 13; see Section 2.1.1).

3.7.5 Main Road

Edward III granted right of access along `the causeway which leads to the castle' to the Prioress of Minster Abbey (see Section 2.7.5). The castle was circular, with a sally port diametrically opposed to the main gate (see Section 2.7.2). The centre of the castle can be located by its central well, now capped, on Castle Green. Its orientation is uncertain but, given that the town itself was refounded by Edward III, the main entrance is likely to have faced down High Street.[28] This road lies on relatively high ground and would hardly merit the term `causeway', which must therefore have lead across the marshy ground from Barrows and Doos Hills to the eastern or south-eastern sally port. The likeliest route for this causeway, which may well be Anglo-Saxon rather than medieval in origin, would run roughly along the current road between the town and Queenborough roundabout and would thus be affected by the proposed new junction.[29]

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[28] The moat was still extant in 1773 and a map of that date shows a distinct widening immediately opposite the proposed position of the main gate, facing down High Street (Figure 6; Hull 1973, 125 (CKS U38 O3)).

[29] However, a broad lynchet-like feature may be seen running along the eastern side of Doos Hill whilst OS 1869 and OS 1898 show an `Old

3.7.6 Barre's Gate

OS 1869 and, more particularly, OS 1898 show a huddle of small structures straddling the road to Queenborough just west of the current roundabout at the foot of Barrows Hill (Figures 13 and 14). It is labelled as Barrows Gate and stands at the junction between the marsh and the old shore, corresponding to the municipal boundary. An early transcript of Queenborough's original charter gives the name as Barre's Gate, which is listed as one of the borough's limits (Woodruff 1897, 172). `bar', like `gate', might indicate some form of toll or other control on traffic and thus help explain a clause in a grant by Edward III to the Prioress of Minster Abbey (see Section 2.7.5). If, instead, `bar' derives from Old English *burh*, which would in this case refer to an Anglo-Saxon fortification, or from *beorg* (`barrow' or `hill'; Wallenberg 1934, 467), then `gate' should also be taken in its Old English sense of `way'. Either of these interpretations would strengthen the argument for the current road lying on the earlier causeway and the second would reinforce the case for an Anglo-Saxon predecessor to the fourteenth century castle. Further documentary research, especially into the municipal records, might clarify the situation here. The preferred new route would affect much or all of this medieval or earlier site.

3.7.7 Barre's Gate to Brielle Way

The northernmost stretch of the proposed route crosses marsh land. As elsewhere in the marshes, timber structures may be preserved here. The proposed route crosses a ditch, shown on the survey of 1773 (Figure 6; Hull 1973, 125 (CKS U38 O3)) and marked as a borough boundary on OS 1869 and OS 1898 (Figures 13 and 14), running north-east from Barre's Gate to the foot of Doos Hill. This ditch might represent a very early extension of the creek, separating Queenborough from the Minster/Leysdown hills, which would have been cut off when the embankment beneath Main Road was erected.

3.8 Summary and Scientific Value of Sites

3.8.1 Introduction

It is difficult to assess *a priori* the importance or value of archaeological sites. Not only does much depend upon the precise date, nature and state of preservation of each site but other aspects, such as the degree to which a given site's relationships (both synchronous and diachronous) to others and to associated landscapes and environments may be established, must be considered. The following observations should thus be taken as indicative only and the significance of any individual sites encountered may well require re-assessment as more data become available.

3.8.2 General

Counterwall' (later largely obliterated by the line of the Sheppey Light Railway) running NE-SW about 200 m north-east of the castle. Either of these might instead represent the early causeway but are far less probable candidates (indeed, the first may represent one bank of an inlet from the old shore line).

Recent studies have highlighted the archaeological potential of Sheppey and of the North Kent Marshes in general and have emphasised the strategic and economic importance of paleo-environmental evidence. The study area lies mostly within a shallow basin, with a complex Holocene infill, between the Minster/Leysdown hills and the mainland and bounded by a paleo-channel of the Medway to the north-west. Wherever the proposed route crosses marshland it may impinge upon the preserved remains of a prehistoric or later timber trackway or of a boat but the probability of such a find at any given position is low. Timber quays might be encountered on the banks of the Swale or, less probably, in the fossilised head of Queenborough Creek. The various counterwalls, especially those carrying Old Ferry Road and Main Road, may have been preceded by timber trackways. Wooden medieval or earlier fish-weirs might be found anywhere beneath the marsh. The finding of an early boat, quay or track would certainly be regionally important and, depending upon age, type and degree of preservation, may prove of national or international significance. Fish weirs, unless very early, would probably be of lesser importance.

3.8.3 The Swale to Straymarsh Cottages

The ferry dates from at least the 1360s and was in use until 1862. Its early name, Trinhide, suggests an Anglo-Saxon or earlier origin. A ferryman's house was built in 1367. Documentary evidence from the sixteenth century indicates that one may have stood on the Sheppey bank of the crossing but there may also have been one on the mainland side. By 1769 there was a building on the mainland bank, south of the current bridge, and another, in an enclosure on the Sheppey bank, north of it. By 1819 there was at least one more building, known as Ferry House, in a mainland enclosure west of the bridge. The building on the Sheppey bank, perhaps on the site of the sixteenth century or earlier ferry house, probably lies beneath the modern ramp up to the current bridge but its enclosure may extend into the proposed route. Though an early post-medieval or earlier Ferry House might rank as a regionally important site, an associated enclosure would probably be only of local interest. Old Ferry Road was probably Anglo-Saxon or earlier in date and may stand upon a timber prehistoric trackway: as Sheppey's original `fixed link', this should certainly be considered as being of regional importance and an early date might prove of national interest. Documentary evidence indicates that the embanked road was widened in the fourteenth and fifteenth centuries but these phases would probably be of only local interest. A Viking army may have chosen this route when pursued onto the island in 1016 and any tangible evidence for this would probably be regionally or nationally important. The proposed route passes between two known medieval saltern mounds and might affect any subsidiary structures they may have had: it is also possible that the road may pass over the sites of lost prehistoric, Romano-British or medieval salterns (see Sections 2.8.2 to 2.8.3 for their significance). The route also crosses a probable fossilised creek alongside Old Ferry Road and various minor drainage ditches: paleo-environmental evidence from the former might be of regional importance if its relationship with the old road can be established.

3.8.4 Straymarsh Cottages to Neats Court

The proposed route rises out of the marshes on to slightly higher ground, representing the old shore where regionally important late Pleistocene or early Holocene land surfaces may survive. A settlement, potentially perhaps of regional significance, may once have stood here but there is currently no certain evidence for one. Neats Court was acquired by John of Gaunt in the fifteenth century and then passed to Henry IV: it remains a possession of the

Crown. Subsidiary farm structures may be expected in the area south of the current road, though these are unlikely to be of more than local importance. The route crosses a very minor water channel, probably natural in origin and unlikely to be of any importance.

3.8.5 Neats Court to Brielle Way

West of Neats Court the proposed route returns to low-lying marshland and crosses two drainage ditches, only one of which is likely to be of any antiquity and neither of any archaeological significance except, perhaps, in paleo-environmental terms. As elsewhere in the marshes, the new road may overlie lost salterns. An earthen counterwall crossed by the proposed route, and probably Anglo-Saxon or medieval in date, continues the line of one side of Queenborough Creek up to the old shore line and the creek probably also once extended this far. Such a creek head, now represented merely by a crooked ditch, may have served as an anchorage: as such, there is a relatively greater (though still low) risk of encountering timber quays or vessels in this area. Queenborough's municipal boundary, established in the fourteenth century, ran along this and an adjoining ditch to Barre's Gate on Main Road and thence to the foot of Doos Hill along another ditch crossed by the proposed route. Barre's Gate, mentioned in medieval charters and on the site of a proposed junction, was probably a medieval settlement site and may have been earlier in date. Main Road is almost certainly of Anglo-Saxon date and it is quite possible that it has prehistoric origins. Archaeological remains at Barre's Gate or beneath Main Road would probably be of local or regional significance. Paleo-environmental evidence from the creek bottom and old shore line would probably be of local or regional importance, as might such material from north of Main Road. Two large mounds of unknown date and purpose, perhaps salterns, stood south west of Barre's Gate. As both of these mounds appear to have been slighted, they are most likely to be of only local importance: one lies outside of the proposed landtake and the site of the other is grazed by the new workings in the vicinity of the ambulance station.

4 PREDICTED ARCHAEOLOGICAL IMPACTS AND EFFECTS OF THE PROPOSED SCHEME

4.1 General

4.1.1 Direct Impacts and Effects

No Scheduled Ancient Monuments nor Listed Buildings would be affected directly by the scheme (but see Section 4.4.4). The natures of the sites identified and of the scheme are such that the impacts of landtake, severance and visual disruption would be non-existent in all but two cases (see Sections 4.4.2 and 4.4.5). Two of these cases involve part of a medieval saltern group (NMR TQ 97 SW 7) but no other entries on the National Monument Record are affected by the scheme. The archaeological resource is strictly non-renewable and therefore any physical damage to it will be permanent and irremediable. Though some indirect damage through environmental changes (see following paragraph) may take effect only over time, any probable direct impact would be occasioned by the construction rather than the operation of the new road. It should be noted that the following discussion of impacts and effects is based on a scheme with mitigation in place, in accordance with DMRB Volume 11. Chapter 5 provides details of the mitigation proposed and Chapter 6 provides an overview of the effects of the mitigated scheme.

4.1.2 Indirect Impacts and Effects

In addition to the obvious potential for damage to any archaeological sites from bridge and road footings and all associated groundworks, including temporary and permanent new service trenches or diversion of existing services, the heavy point-loading which construction plant often imposes could be equally destructive, especially when turning and sometimes at several metres depth. This threat is not confined to just the landtake but may include spoil heaps, plant access routes and work compounds. Any indirect damage through additional compaction of underlying layers caused by operational vibration and loading of the road would be likely to be negligible compared with the risk posed by construction work. Some sites may also be threatened indirectly by environmental changes (see Section 4.3.3). Indirect damage is particularly undesirable as the unexposed deposits affected cannot be subjected to `preservation by record'.

4.2 Kingsferry Bridge

4.2.1 Banks of the Swale

The counterwall flanking the mainland side of the Swale is likely to stand on earlier embankments and/or timber revetments. On the Sheppey side, it is likely that the embankment here is somewhat later, closing off the fossil creek north-west of Old Ferry Road, but it is possible that the creek narrowed at this point and that this stretch of the wall also conceals ancient origins. Though the current design for the new bridge avoids both counterwalls, relatively short stretches of either counterwall might be compromised during the construction phases whilst work on two or three of the new piers might encounter early structures on the foreshore. If any early structures are encountered

here, and dependant upon their date, the probable effect here may be categorised as being of minor to moderate significance.

4.2.2 King's Ferry

The original ferry probably plied between quays south-east of (or possibly under) the current bridge, where the Old Ferry Road ran, so only outlying revetments of `Trinhide' are liable to be affected by the proposed scheme. However, if any early timbers are encountered here, their recording and dating should be considered a priority as the history of this crossing is tied inextricably to that of the whole of Sheppey. There is thus potential for an effect of minor to moderate significance here.

4.2.3 Possible Ferry House and Enclosure

A medieval ferry house may have stood on the north-west side of Old Ferry Road on the Sheppey bank, one probably did so in the sixteenth century and there was certainly a building and enclosure here in the mid eighteenth century. The building probably lies beneath the road and rail accesses to the current bridge and the proposed route runs north of the site of the enclosure. The site should not be affected by the scheme.

4.3 Counterwalls and Timber Structures in the Marshes

4.3.1 Counterwalls

Only relatively short stretches of the various counterwalls are liable to be affected by the proposed route. The embankments which carry Old Ferry Road and Main Road are of particular interest and both they and the roads they support are liable to be of multiple phases (see following paragraph). It is currently envisaged that the finished road surfaces would be carried over these features, but attention should be paid to the degree to which their integrity may be compromised by preparatory work and by compaction, during both the construction phase and the operational life of the road. In the initial stages of construction, at least, the counterwalls would constitute obstructions to plant movement and, unless very carefully protected, could be subject to considerable damage. Dependent upon the date of the structures and the degree to which construction work would endanger them, the probable effect may be categorised as minor to moderate.

4.3.2 Timber Structures

Wherever the proposed route crosses low-lying marshland (ie, between Kingsferry Bridge and near Straymarsh Cottages, and between Neatscourt Cottages and Main Road), it is possible that it would encroach upon the site of anaerobically preserved remains of a prehistoric or later timber trackway or boat. Fortunately, except as noted below, the probability of encountering either of these is fairly low, though boats are somewhat likelier to be found in two fossil creeks (one probably lying immediately north west of Old Ferry Road, the other south of Main Road). On current evidence, medieval or earlier wooden fish-weirs might be found anywhere beneath the marsh. Whilst any of the above remains would be particularly susceptible to indirect damage, they are likely to lay at some depth and therefore be at risk from direct damage only where it is proposed to carry the new route on piers or piles. Both Old Ferry Road (crossed twice by the proposed route) and Main Road (beneath a proposed junction) are probably Anglo-Saxon or earlier in origin and may have had timber predecessors. A wooden track leading to Rushenden may lie below the counterwall flanking the south side of Queenborough Creek, crossed by the proposed route, and timber quays are a possibility around the fossilised head of that creek. Less probable is the presence of a timber predecessor to the counterwall forming the north western side of the putative fossilised creek next to Old Ferry Road. Such structures are likely to lie somewhat closer to the surface than boats or fish weirs and would thus be more susceptible to direct damage. The potential significance of any effects on buried timber structures are noted in the following paragraph.

4.3.3 Implications of the Discovery of Timber Structures

Timber structures are particularly vulnerable to the indirect physical damage noted above (Section 5.1.2). Further, decay will inevitably set in if the anaerobic environment is compromised, typically by a reduction in the local watertable or by the disturbance of closely packed overlying soils, and changes in water quality may also prove deleterious. Thus, although preservation *in situ* is usually to be preferred, for both scientific (PPG 16 1990, paragraphs 6, 8, 13; SBC 1994, paragraph 5.28, resolution E12) and financial considerations, any such strategy must be accompanied by provision to ensure that long-term anaerobic conditions and water quality are maintained and, perhaps, monitored. There is no non-invasive technique currently available which would allow the presence or otherwise of preserved timber structures to be determined in advance. Thus, as it cannot yet be determined whether any such sites exist along the line of the new road, nor can their nature, depth and age yet be known, the significance of the effect of the work may prove to be anything from non-existent to major.

4.4 Other Sites

4.4.1 Prehistoric and Romano-British Salterns

No prehistoric or Romano-British saltworks are known from the Sheppey marshes, though it is highly probable that the latter, at least, exist. Assuming they are not overlain by more than two to three metres of alluvium, a magnetometer survey should locate any along the proposed route.[30] Where it is proposed to carry the new road on an embankment, and to minimise the compaction of underlying strata, any such sites which lie close to the surface are likely to be at risk but deeper ones would probably be unaffected. Piers or areas of close piling would compromise all such remains within the area concerned. The potential effect on any such sites may probably be classed as minor or moderate.

4.4.2 Medieval Salterns

The proposed route would pass between two known saltern mounds, probably of twelfth to thirteenth century date, sufficiently closely for any peripheral structures to be considered to be at risk (one extends about 5 m into the footprint of the embankment). A third saltern in the same group would be largely included in the proposed landtake on the south-eastern side of the current A249, where this is due to be partially rebuilt. Associated features may extend beyond the limits of these mounds, though the evidence from Seasalter suggests that this is probably not the case. It is possible that other medieval salterns, either enveloped by alluvia or razed to ground level, also lie along the route. These should be susceptible to location with a magnetometer but any peripheral structures may not. The landtake and visual impact of the scheme would have a moderately significant effect upon the two known salterns. Dependent upon the extent of any peripheral structures, the effect of physical impact upon these salterns would probably be of minor to moderate significance as would be that upon any buried examples along the route. Should any razed examples be encountered, the physical effect would probably be of minor significance unless extensive peripheral structures survived, in which case the effect might be moderately significant.

4.4.3 Possible Site between Straymarsh Cottages and Neats Court

Topographical considerations suggest that there may have been a medieval or earlier occupation site on the slight rise where Old Ferry Road left the marshes. Standard field evaluation techniques should establish whether or not this is likely to be the case. The relevant area is crossed by the proposed route and would also hold a new roundabout and associated slip roads, largely cut into the existing ground surface. This area would also be a possible candidate site for works enclosures and plant turning-circles. The effect of construction work on any such occupation site would probably be of minor to moderate significance, depending upon its age, nature, degree of preservation and precise location.

4.4.4 Neats Court

[30] Pottery or tile kilns should also show up on a magnetometer scan.

A late post-medieval sheepfold, near Neats Court would lie beneath the new route. The scheme would obliterate the site but the structure is of little importance and the effect would be either insignificant or, if there were a medieval predecessor, of only minor effect here. The new route would distance heavy traffic from the Grade II Listed Building at Neats Court, providing it physical and visual benefits of minor significance. As much of the flat land to south of the new route is industrial, the effect of the scheme upon the wider setting of the manor house would be negligible or, perhaps, slightly beneficial.

4.4.5 Queenborough Creek

The head of Queenborough Creek probably once extended up to the old shore line near the current A249. An eighteenth century estate map indicates that it then followed the line of the extant ditch north east towards Barre's Gate but it is likely that at least one channel flanked the southern counterwall. By 1773 the upper part of the creek was cut off from navigation by a restriction, possibly fourteenth century in origin, near the castle site. The fossilised creek would be crossed by the proposed new road and a spur would cross the old shore line to meet a slightly diverted stretch of the current A249 east of Queenborough Roundabout. Dependent upon the antiquity and navigability of this stretch of the waterway, timber remains of vessels or harbour fixtures might lie beneath the alluvia within the creek area and other remains of any associated structures might survive above the old shore line (which would itself be of paleo-environmental interest). Shallow groundworks might encounter archaeological remains in the vicinity of the counterwall, the old shore line and Main Road but, assuming only low loadings are imposed on underlying strata and hydrological conditions are left unaltered, any remains elsewhere in this area are likely to be affected only by piers or piling. The scheme would cut the counterwall and creek head in two: this severance and the new road's visual impact would have an effect of minor significance. The physical effect of the scheme here would probably be of only minor significance, though there is potential for one of moderate to major significance should timber structures be encountered.

4.4.6 Barre's Gate

The proposed new junction with Main Road would lie on the site of a group of small buildings extant at the end of the last century and probably marking the position of a medieval or earlier occupation site at the eastern end of a causeway leading to Queenborough. Dependent upon the age and degree of preservation of the causeway and occupation site, the physical impact of the scheme would probably be of minor to moderate significance The site of one of two razed mounds, perhaps salterns, south west of Barre's Gate would be clipped by a new slip way into Queenborough Ambulance Station from a stretch of Main Road due to be rebuilt as part of the proposed scheme. The effect of the scheme on this site should be of no more than minor significance and probably negligible.

5 MITIGATION

5.1 General

5.1.1 Direct Impacts and Effects

Wherever feasible, the scheme would seek to avoid damage to the archaeological resource. Where this is not possible, the threatened site or deposit would be suitably examined and recorded archaeologically prior to the construction process which might compromise it. Wherever practical, the engineering solution would in any case seek to minimise any negative impact upon the resource. Owing to considerations of access and of minimising visual and physical environmental impact, all such work would be conducted shortly before construction work. As the presence or otherwise of whole classes of sites cannot be established reliably beforehand, construction work in areas where such may be encountered would be closely monitored and interrupted as appropriate to allow for fuller archaeological examination and recording. Dependent upon the nature and importance of any given site or find, examination may range from simple observation, through sampling, to full controlled excavation. As noted above (Section 4.3.3), should it be decided to preserve timber (or other organic) remains *in situ*, arrangements must be made for the long-term maintenance of their environmental conditions. In general, the scheme would in any case be so designed as to minimise disturbance to the hydrological regime. As long as such provision is made none of the sites identified, whether actual or potential, appear liable to significant operational effects of the scheme (ie, year 1 to year 15) nor to any significant constructional effects after the appropriate mitigatory procedures have been implemented.

5.1.2 Indirect Impacts and Effects

In order to minimise the potential for indirect damage to the archaeological resource, strict traffic-management controls would be adopted during construction work and all areas where heavy plant (including lorries) may be employed would be suitably protected from such damage. In view of the ecological value of surrounding land the former measure is, in any case, desirable. Given the soft ground conditions likely to be encountered, the latter proposal would also appear justifiable on logistical grounds. Where possible, turning circles, where point-loading may be several times greater than elsewhere, would be restricted to areas already examined archaeologically.

5.2 The Swale

In order to minimise costs and the risk of flooding, rather than pre-emptive evaluation trenching, an archaeological watching brief would be conducted during any groundworks on the foreshore and the banks of the Swale. A full drawn, written and photographic record would be made of any structures exposed. Any apparently early timbers exposed would be sampled for dendrochronological and radiocarbon dating and species identification. Any timbers threatened with destruction would be systematically removed under archaeological supervision and placed in suitable short-term storage pending assessment. The potential for paleo-environmental evidence would be assessed during groundworks and suitable samples collected if required.

5.3 Counterwalls and Timber Structures in the Marshes

5.3.1 Counterwalls

It would be preferable to carry the proposed road over Old Ferry Road, over the counterwall running parallel to it and over the southern counterwall at Queenborough Creek without damaging them. If this is considered technically or financially unfeasible, transects would be cut across the embankments where they are intersected by the proposed route to at least the depth to which construction work is likely to affect them directly or indirectly. This work would attempt to date the origins and chart the development of the structures and of the creek between them. Paleo-environmental evidence would be collected in order to examine and compare the alluvial sequence on both sides of the banks. The most northerly of the two transects on Old Ferry Road would be extended to examine the sequence of deposits at the boundary between the superficial alluvia and the London Clay, where late Pleistocene or early Holocene land surfaces may survive, perhaps interdigitated with alluvial deposits. This site is of particular importance as it should furnish important data on both the medieval reclamation of the marshes and local variations to the post-glacial marine transgression and regression sequence. The potential for further fieldwork and paleo-environmental study at each site would be assessed on the strength of this evaluation work.

5.3.2 Timber Structures

Where the proposed route crosses the marshes any remains other than salterns or kilns, which can be located by means of a magnetometer, should be expected only at some depth. Therefore, superficial evaluation trenching between Kingsferry Bridge and Straymarsh Cottages, between Neats Court and Barre's Gate and between Barre's Gate and Brielle Way, is likely to be of little or no predictive value. However, there is a limited but inescapable possibility that construction work may disturb timber structures (tracks, boats, quays or fish-weirs). If stretches of the new road are to be constructed upon a raft or floating embankment, the loading this imposes must be suitably low. Any such areas would be machine-stripped to an agreed depth under archaeological supervision prior to the laying down of the base. Where, on the other hand, the road is to be carried on piers, whether or not supported upon piles, the cutting of the pier positions would be closely monitored archaeologically, with paleo-environmental samples taken as appropriate.[31] Were any ancient features to be encountered, construction work at that position would be halted and further limited manual archaeological excavation undertaken, sufficient to assess the nature, date, extent and degree of preservation of the material. If significant remains are identified, the County Archaeologist would be notified immediately. A suitable archaeological response would then be devised in consultation with the County Archaeologist and, if appropriate, English Heritage and/or Greenwich Maritime Museum. Care would be taken to ensure that any remains do not undergo degradation whilst this response is formulated.

5.4 Other Sites

[31] The possibility of prospecting pier positions by sinking small, closely spaced boreholes, backed up by limited excavation to investigate positive results, has also been investigated but such an approach would be very expensive and could itself damage important remains.

5.4.1 Prehistoric and Romano-British Salterns

A magnetometer survey would be conducted shortly prior to construction in order to locate probable early saltern (or kiln) sites along the landtake in the marshes. Where liable to damage from construction work, any such sites identified would be mechanically stripped under archaeological supervision and archaeological deposits fully excavated by hand. Appropriate paleo-environmental and dating samples would be recovered and assessed.

5.4.2 Medieval Salterns

Where the proposed route passes between the saltern mounds IQ 11/100 and IQ 11/101 and where it passes by the sites of the mounds east of Queenborough and south-west of Barre's Gate, the affected area would be evaluated by trenches cut mechanically under archaeological supervision shortly prior to construction work and further mechanical or manual excavation and recording conducted as appropriate if peripheral features are exposed. Any suitable paleo-environmental and dating samples would be recovered and assessed in any case. Preserved organic remains would be recovered and placed in suitable short-term storage pending assessment. As no intrusive groundworks are proposed around saltern IQ 11/107, no excavation would be undertaken here but the mound would be surveyed and local engineering solutions (steepened or revetted embankment, diverted boundary fence etc) employed to minimise the effect, if necessary. Similar measures would be employed, if feasible, to mitigate the impact on IQ 11/100 and IQ 11/101.

5.4.3 Straymarsh Cottages to Neats Court

Where the route crosses the relatively higher outcrop of London Clay, any available ploughed fields would be field-walked shortly prior to construction. In addition, trenches totalling in length approximately 33% of the chainage would be machine cut under archaeological supervision along this stretch of the route and paleo-environmental samples collected as appropriate. One of these trenches would be sited by the sheepfold near Neats Court in order to determine whether an earlier structure stood there. Results from both tasks would be used to formulate a suitable archaeological response. Where the proposed route crosses back over the old shore line south of Neats Court, a transect would
be machine cut with a toothless ditching bucket under archaeological supervision and paleo-environmental samples collected as appropriate.

5.4.4 Barre's Gate

Shallow evaluation trenches would be cut in the vicinity of Barre's Gate to investigate the nature of the site. At least one trench would run up to Main Road. The potential for further fieldwork here would be assessed on the strength of this work: a full watching brief during the construction of the proposed junction would form the irreducible minimum response here though the preferred option is likely to be for open area excavation if structures of any antiquity are identified during evaluation.

5.4.5 Paleo-environmental Data from around Barre's Gate

All available borehole data for an area extending from Brielle Way to south of the counterwall along the southern bank of Queenborough Creek would be examined, in consultation with appropriate specialists, with a view to elucidating the nature and antiquity of the creek head. If necessary, further boreholes would be sunk, collecting U4 samples. A transect across the old shore line, where it is proposed to construct a slip road to the current A249, would be machine cut with a toothless ditching bucket under archaeological supervision and paleo-environmental samples collected as appropriate.

5.5 Post-excavation

5.5.1 Finds Processing

Any pottery, tile, bone, metalwork etc recovered would be suitably cleaned, marked, bagged and boxed in accordance with UKIC Conservation Guidelines Nr 2. Perishable materials would first be assessed before arrangements are made for any long-term preservation and storage. After study, all finds would be deposited in a suitable archive to be agreed with the appropriate authorities.

5.5.2 Assessment

The records of any archaeological fieldwork would be prepared to a suitable level of archive and assessed for further study. The field assessments of paleo-environmental (including pedological) evidence would be followed by preliminary processing of a subset of any collected samples and assessed for further study. Assessment work would consider the material both on a site-by-site basis and in terms of contributing to an overall study of the development of the landscape and its exploitation through time.

5.5.3 Analyses

Further analysis of the archaeological and paleo-environmental material would be undertaken on the basis of the foregoing assessment work and archival reports prepared.

5.5.4 Publication

In addition to a detailed archive report, a general summary would be prepared for publication at county level (in, for example, the CAT's own annual report) and, if the results merit, in *Archaeologia Cantiana*. Brief notes on the results of any significant findings of the project would be prepared for inclusion in relevant national specialist

journals as appropriate.[32] Fuller reports on any major discoveries would be prepared for these journals. The publication of a less technical account of the work for the general reader at the local or regional level would be considered.

5.6 Summary

5.6.1 Indirect Damage

Construction traffic would be strictly managed and all areas where heavy plant would be employed suitably protected. Where possible turning circles, where point-loading may be several times greater than elsewhere, would be restricted to areas already examined archaeologically. In so far as is feasible, any strategy for the preservation *in situ* of timber or other organic remains encountered would be accompanied by provision to ensure that long-term anaerobic conditions are maintained. If this proviso is met, no further significant degradation of the resource, whether due to constructional or operational impacts, is envisaged after mitigation measures have been taken.

5.6.2 The Swale

A full archaeological watching brief would be maintained during groundworks in the Swale and on its banks. Any apparently early timbers exposed would be sampled for dating and identification. Any timbers threatened with destruction would be removed under archaeological supervision and placed in suitable storage. Paleo-environmental evidence would be assessed during groundworks and suitable samples collected if required.

[32] For example: Proceedings of the Prehistoric Society, Britannia, Medieval Archaeology or Post Medieval Archaeology.

5.6.3 Counterwalls

It would be preferable to carry the proposed road over the various counterwalls without damaging them. Where this is not feasible, transects would be cut and paleo-environmental evidence collected where they are intersected by the proposed route. Transects would also examine associated deposits, most notably those flanking the old shore line between Straymarsh Cottages and Cowstead Farm. The potential for further work would then be assessed for each site.

5.6.4 Timber Structures

Generally, superficial evaluation trenching in the marshes is not advised. However, should part of the road be rafted, a low loading must be maintained and any stripping required conducted under archaeological supervision. Where piers are to be employed, the excavation of their positions would be closely monitored. If any ancient features are encountered, construction work at that position would be halted and adequate manual excavation, recording and sampling undertaken to assess the material. If any significant remains are identified, a suitable archaeological response would be devised in consultation with the appropriate authorities.

5.6.5 Salterns

A magnetometer survey would be conducted in order to locate any lost salterns or kilns along the landtake in the marshes. Where liable to damage from construction work, such sites would be fully excavated, recorded and sampled. Where the proposed route passes close to known or suspected salterns and may endanger putative peripheral structures, evaluation trenches would be cut in the affected area and further excavation and recording conducted as appropriate. Paleo-environmental and dating samples would be recovered.

5.6.6 Straymarsh Cottages to Brielle Way

Any available ploughed fields on the outcrop of London Clay here would be field-walked and evaluation trenches cut. A suitable archaeological response would then be formulated. The magnetometer survey mentioned in the preceding paragraph would include the area of the landtake between this outcrop and the counterwall south of Queenborough Creek. If liable to damage, this counterwall would be examined by transect. Available borehole data for the vicinity of the fossilised creek head would be examined in consultation with appropriate specialists. Further boreholes may be sunk and transects cut across the old shore line. Shallow evaluation trenches would be cut on the site of the proposed junction with Main Road and the potential for further work here assessed.

5.6.7 Post-excavation

Non-organic finds would be suitably processed, organic remains assessed and then processed as appropriate.

Fieldwork records would be prepared for archive and assessed for further study. Preliminary processing and assessment would be conducted on a subset of paleo-environmental samples. Further analyses would be undertaken on the basis of the foregoing assessments and archival reports prepared. A general summary would be prepared for publication at county level and more detailed reports for national periodicals prepared if and as appropriate. A less technical account may also be produced.

6 SIGNIFICANCE OF IMPACTS AND EFFECTS AFTER MITIGATION

6.1 General

Any physical damage to the archaeological resource would be permanent. The resource is at minimal risk from the operation of the new road: any likely damage is liable to be caused by construction work. In addition to the possibility of direct damage to any archaeological sites from groundworks, including service trenches, heavy point-loading from construction plant can also be very destructive. Some sites may also be threatened by environmental changes. Timber structures (boats, tracks, quays and fish-weirs) are particularly vulnerable to both these forms of indirect damage. The probable archaeological effects of the scheme would range from negligible to moderate in significance although there is an unavoidable risk of a minor to major effect upon any as yet unknown sites buried below the marshes. Wherever feasible, remains would be preserved *in situ*, they would otherwise be recorded and recovered as appropriate.

6.2 The Swale to Straymarsh Cottages

Construction work on the new bridge may damage or destroy a relatively short stretch of the counterwall on either side of the Swale: that on the mainland bank is likely to stand on an earlier structure and that on the island side may do so. Timber quays from the early phases of the ferry may survive here, though they probably lay further east, and the recording and dating of any such structures would be considered a priority. The medieval and later ferry houses lie outside of the proposed landtake. Two short stretches of the slight embankment carrying Old Ferry Road and one of the counterwall running parallel to it would be crossed by the new road. The former is of particular interest and is likely to be of multiple phases. Putative peripheral features associated with two known saltern mounds may lie beneath the proposed route and a third would lie on the margin of the landtake required for a realignment of the existing road. Other prehistoric, Romano-British or medieval salterns, either razed or submerged, may also lie along the route but should be susceptible to location with a magnetometer. The scheme would certainly have landtake and visual effects of moderate significance upon the known salterns and minor to moderate physical effects upon them, the Old Ferry Road and the counterwall. There is a reasonable potential for minor to moderate effects upon as yet unproven sites in this stretch and a far lesser one for major effects.

6.3 Straymarsh Cottages to Neats Court

A medieval or earlier site might stand on the slight rise where Old Ferry Road left the marshes and prehistoric land surfaces may survive here. This is an area where extensive construction work is planned, with slip roads leading to a new roundabout. If there is indeed a site here, the potential effects upon it would be of minor to moderate significance. There would be indirect beneficial effects of the scheme upon the listed building at Neats Court of minor significance and any negative effect upon its wider setting, other than on a potential minor medieval site (see Sections 3.5.5 and 4.4.4), would be neligible.

6.4 Neats Court to Brielle Way

The new road would probably cross the fossilised head of Queenborough Creek. Dependent upon its age and size, timber remains of vessels or harbour fixtures may survive here. At least one side of the creek head was bounded by a counterwall, which would be crossed by the proposed route. The proposed new junction on Main Road lies on the site of what was probably a medieval or earlier occupation site at the end of a causeway leading to Queenborough. The causeway too would be affected by the new road. The site of a razed mound, possibly a saltern, would be clipped by a proposed new entrance into Queenborough Ambulance Station. A new slip road to the current A249 would cross an ancient shore line. All significance effects in this area are likely to be minor to moderate in but, once again, there is a slight possibility of major effects upon any site buried beneath the marshland.

7 CONCLUSIONS

7.1 Impact and Effects

The archaeological resource is chiefly at risk of permanent physical damage from the construction rather than the operation of the new road. Some sites, particularly where timber structures survive, may also be threatened by environmental changes. Unless important timber remains are encountered beneath the marsh, there are unlikely to be any major adverse effects upon the archaeology as a result of this scheme although some minor to moderate ones have been identified:

- Short stretches of early counterwalls or of timber structures peripheral to the King's Ferry may be compromised by work on the new crossing but the sites of various phases of ferryman's houses all lie outside of the area affected by the scheme.

- Two short stretches of Old Ferry Road and one of the counterwall running parallel to it would be crossed by the new road.

- Peripheral features associated with two saltern mounds listed on the National Monuments Register may lie beneath the proposed route and one of these mounds would be partially included in the landtake. A third, also on the National Monuments Register, would lie on the margin on the landtake and may be impinged upon visually but should not be at risk of physical damage. Other razed or buried salterns may also lie along the route where it crosses the marshes.

- There may have been an occupation site on the higher ground between Straymarsh Cottages and Neats Court and prehistoric land surfaces may survive here, an area where extensive construction work is planned.

- There would be indirect beneficial effects upon the listed building at Neats Court, but a late post-medieval structure would be overlain by the new route and there is a possibility of a minor medieval site here.

- The new road would probably cross the fossilised head of Queenborough Creek, bounded by a counterwall, where early timber remains may survive.

- The proposed new junction on Main Road (itself perhaps an early causeway) probably overlies the site of a medieval or earlier occupation site.

- The site of a razed mound near the ambulance station would be clipped by the scheme and a new slip road would cross an ancient shore line.

7.2 Mitigation

Construction traffic would be strictly managed and areas at risk from it protected. Minimal disturbance of the hydrological regime should ensure that no further significant degradation of the resource should occur after the relevant mitigation measures have been taken. There would be a presumption in favour of preservation *in situ*: where this is not feasible, recovery and preservation by record would be conducted as appropriate. Full archaeological watching briefs would be maintained during groundworks in the Swale, on its banks and during excavation for piers in the marshes.

Where counterwalls or early roads are threatened, archaeological transects would first be cut across them. Where any stretch of the road is to be rafted, a low loading would be maintained and any stripping required conducted under archaeological supervision. A magnetometer survey would be conducted along the landtake in the marshes, where liable to damage from construction work, any sites thus located excavated. Evaluation trenches would be cut where the new route passes close to known or suspected salterns, at Main Road and on the higher ground between Straymarsh Cottages and Neats Court: any available ploughed fields in the last area would be field-walked. Available borehole data for the vicinity of the fossilised creek head would be reviewed, further boreholes may be sunk and transects cut across the old shore line. Other paleo-environmental evidence would be gathered as appropriate.

The potential for further work at each of the foregoing sites would be continually assessed in consultation with the relevant authorities. Post-excavation work would involve finds processing, the preparation of a project archive prepared and the assessment of paleo-environmental and site data. A general summary report would be written and other reports may also be prepared.

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C E Woodruff & C H Woodruff (eds) 1902, `Descriptive Catalogue of Documents Belonging to the Kent Archaeological Society' in *Archaeologia Cantiana* XXV, 256-298.

T J Woodthorpe 1951, *A History of the Isle of Sheppey*, Sheerness.

8.2 Uncited Sources

In addition to various catalogues of material held by the BM, PRO and CKS, the following works were consulted but are not cited in the report:

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W F Bergess 1981, *The Kent Bibliography Supplement*, Library Association.

W F Bergess 1992, *Kent Maps and Plans*, Library Association.

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N Grimsdell 1978, *The Isle of Sheppey: a list of books relating to Sheppey in the Kent County Library*, (2nd ed.) Kent County Council.

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K R MacDonald 1949, *The Geography of Sheppey*, unpublished thesis, King's College, London.

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S Pratt 1992, `Queenborough Castle, Sheppey' in *Canterbury's Archaeology 1991-1992*, CAT.

W Studt, *A Chronology of the Isle of Sheppey*, Kent County Council (n.d.).

8.3 Periodicals

Complete runs of the following periodicals (beginning in each case with volume I) were searched for relevant material:

Archaeologia Cantiana, 1858-1995.

Bygone Kent, 1980-1995.

Cantium, 1965-1975 (discontinued).

Invicta Magazine, 1908-1913 (discontinued).

Journal of Kent Local History (now *Journal of Kent History*), 1975-1995.

Kent Archaeological Review, 1965-1995.

Kent Magazine, 1896 (discontinued).

Kentish Notebook, 1881-1892 (discontinued).

Kentish Register, 1793-1795 (discontinued).

Medieval Archaeology, 1957-1994.

Southern History, 1979-1994.

8.4 Acknowledgements

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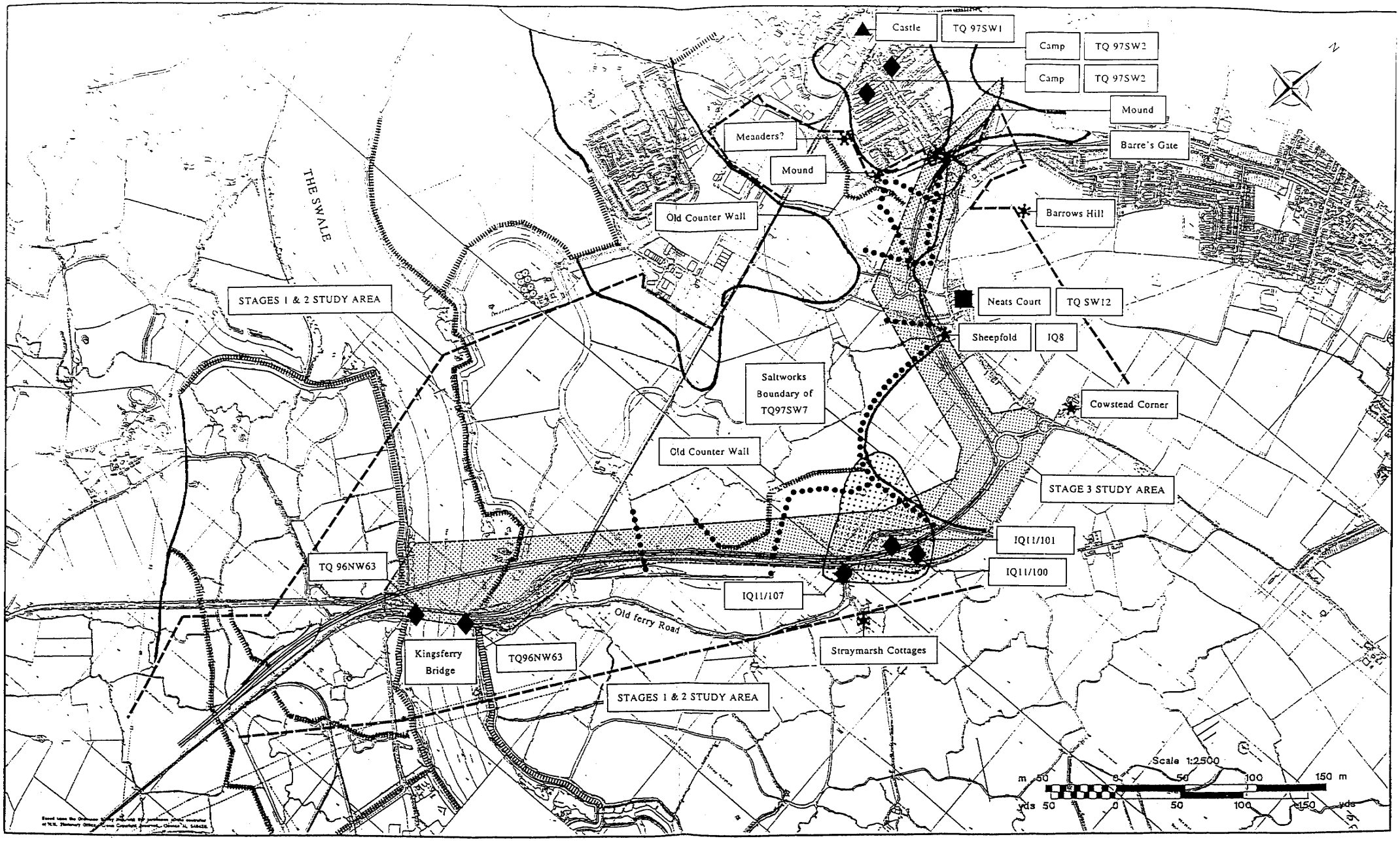
FIGURES



Client

HIGHWAYS AGENCY

Project

A249 IWADE BYPASS TO QUEENBOROUGH IMPROVEMENT

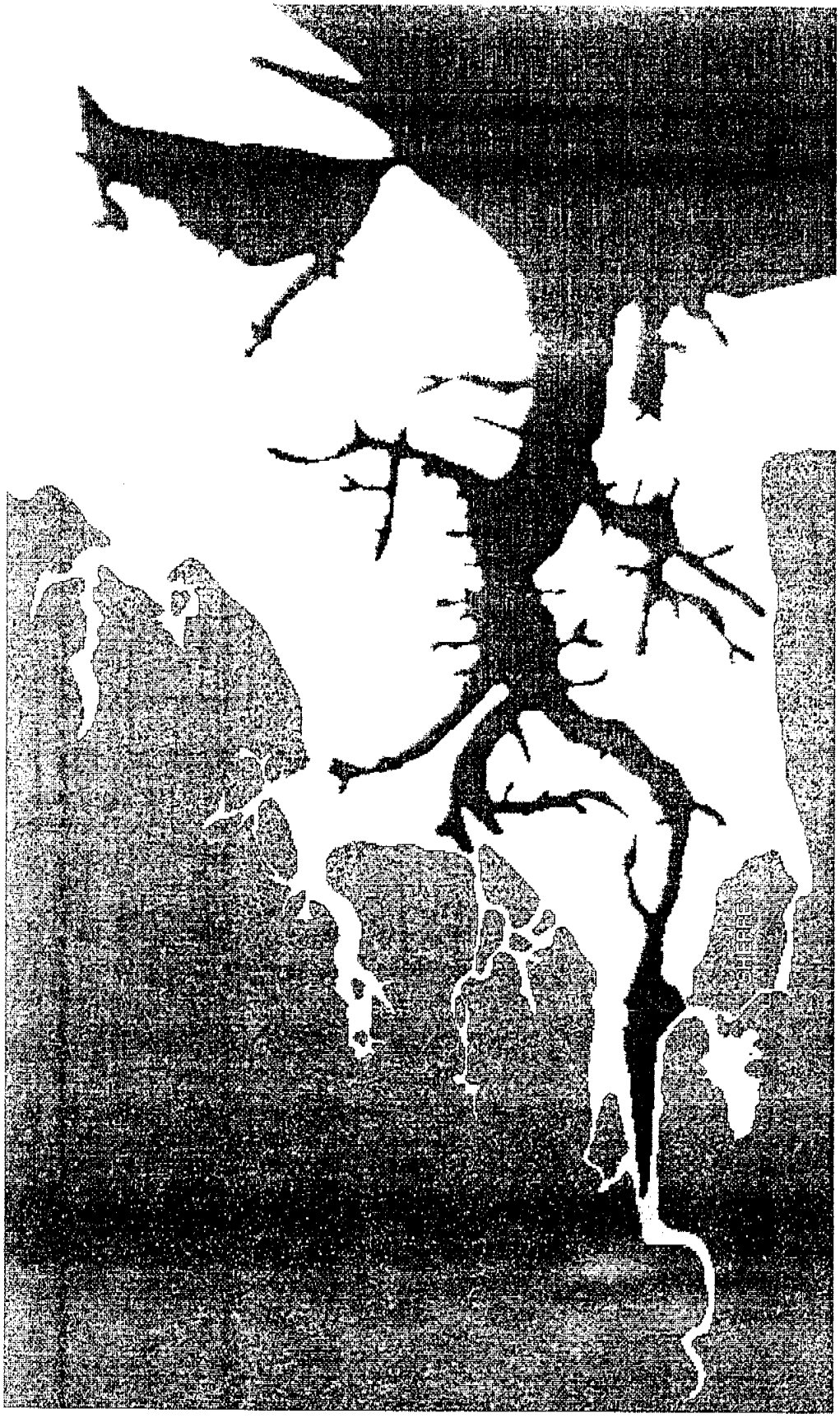
- Scheduled Ancient Monument
- Listed Building
- S.M.R. sites
- Other sites and localities
- Embankments
- Extant drainage ditches
- Approximate old shore line

(NOTE: reference codes refer to NMR and Stage 1 study sites referred to in the text)

ARCHAEOLOGICAL SITES AND LISTED BUILDINGS

Mott MacDonald

Figure 1

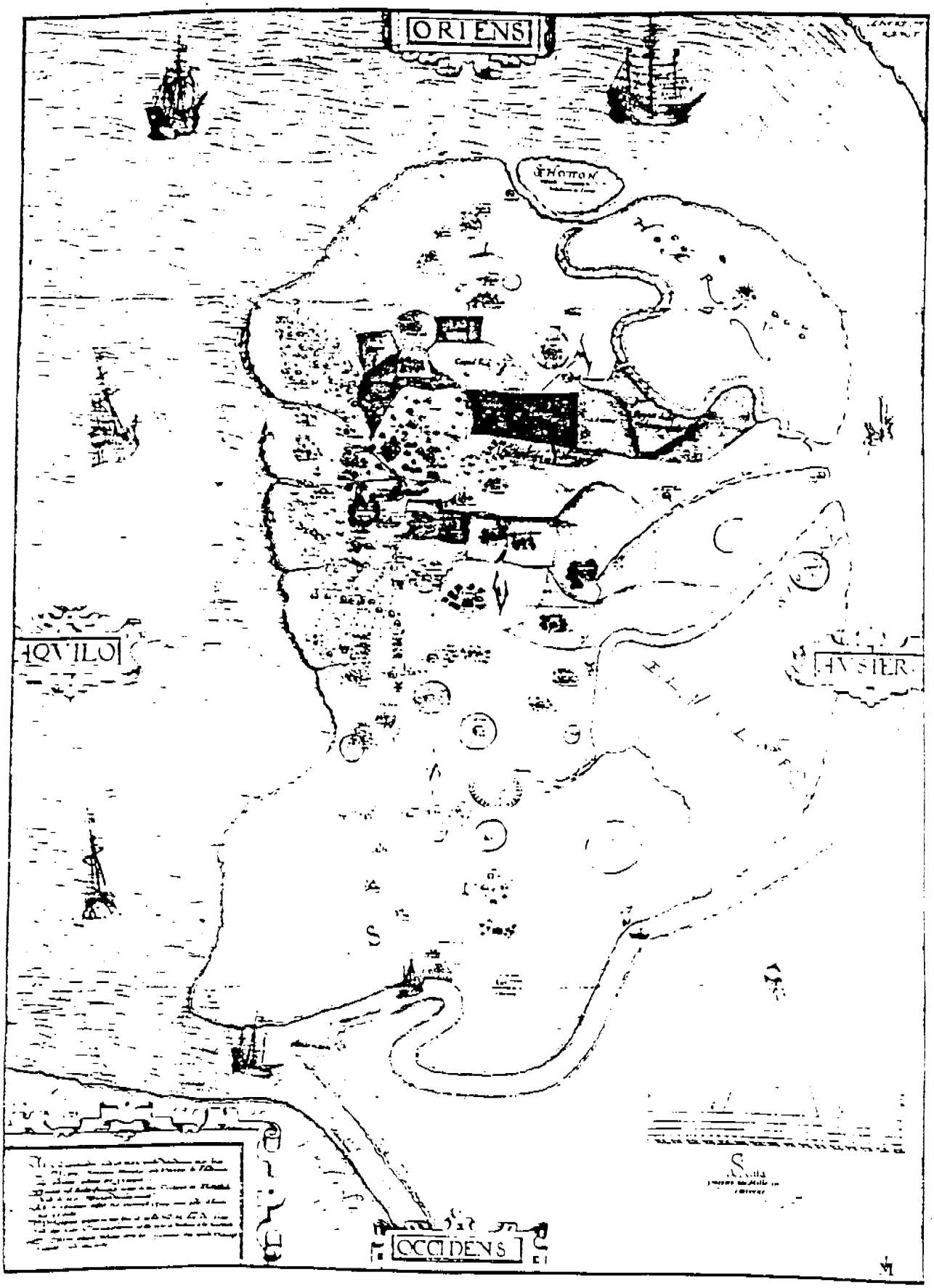


The Thames Estuary, 7000-6500 BC, showing current and ancient coastlines (after Wilkinson & Murphy 1995, fig.126)

Fig.2

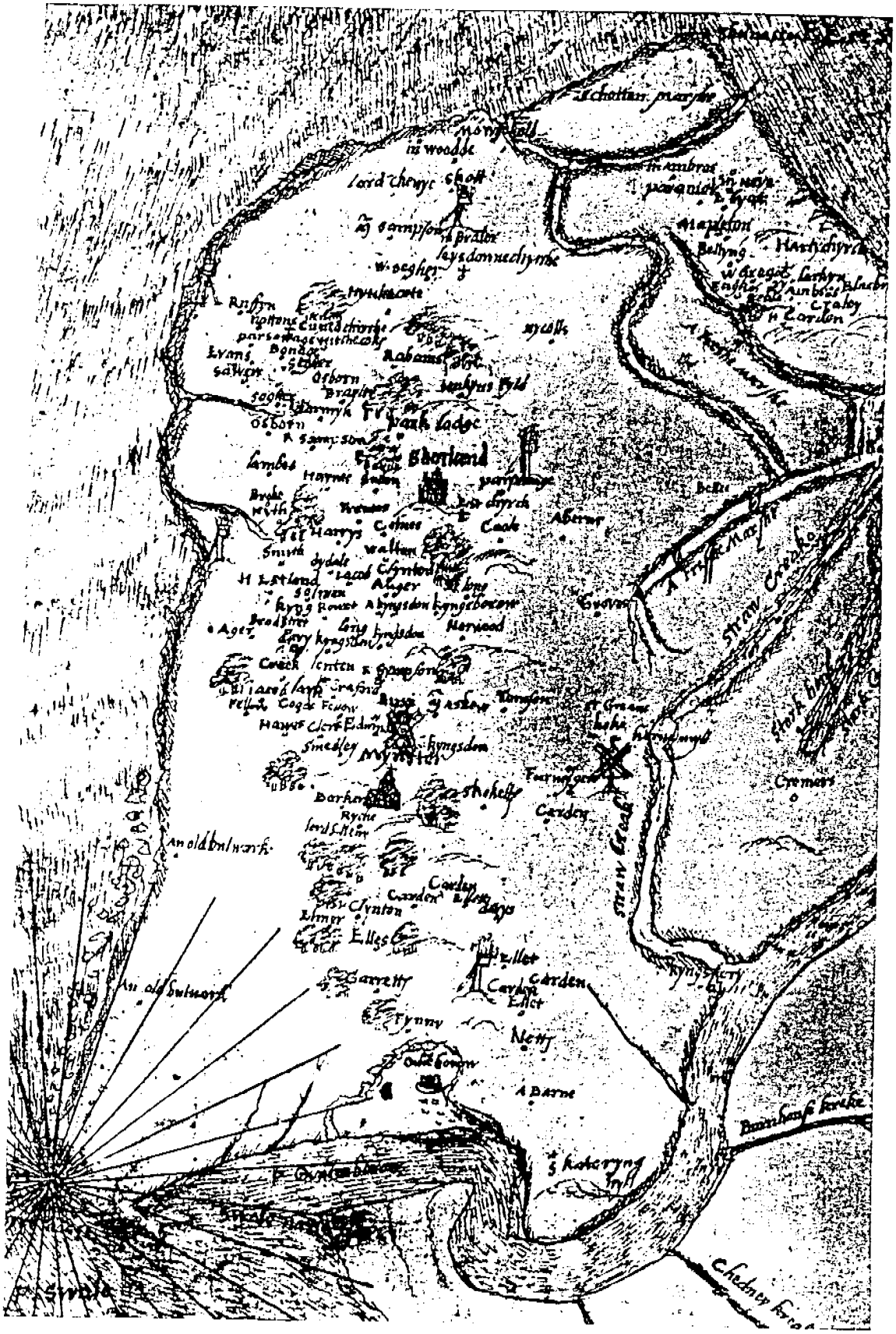
Relief map of Sheppey, showing boundary of the alluvia and extant and recorded salterns (filled and hollow squares)

Fig.3



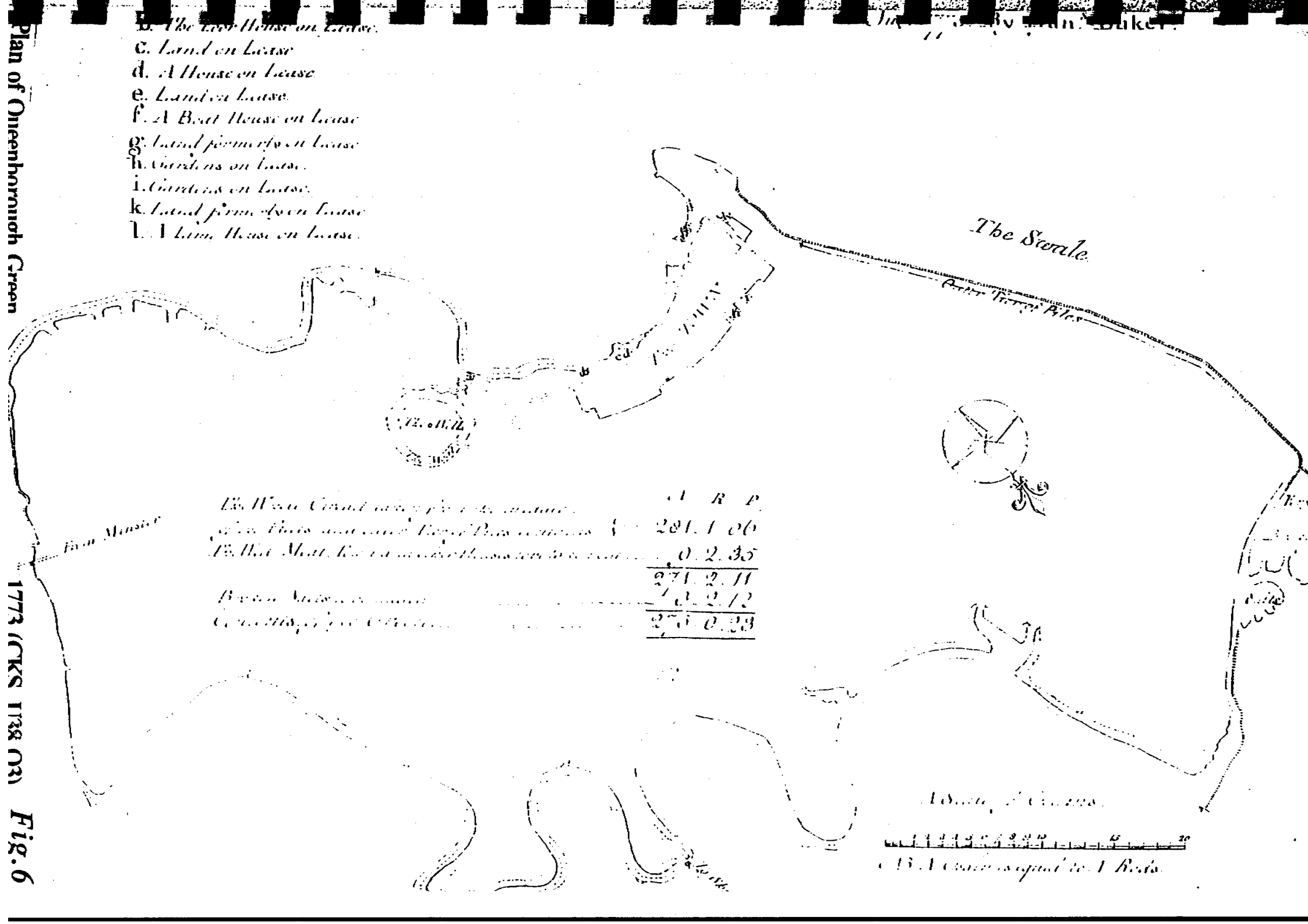
Map of Sheppey, c.1572 (PRO, MPF 240)

Fig.4



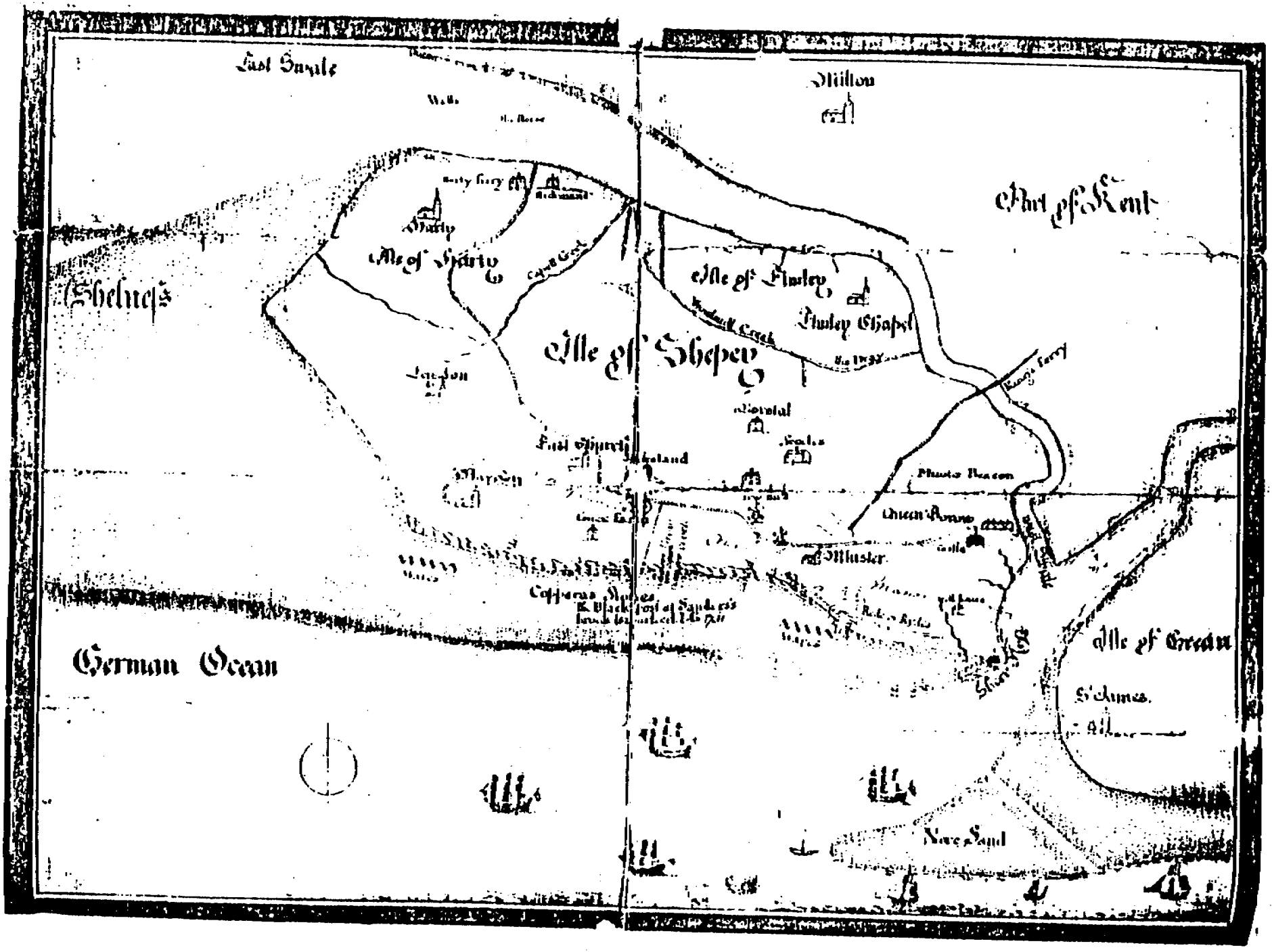
Map of Sheppey, c.1585 (BM, Cotton MSS, Aug.I.i, 51) *Fig.5*

Plan of Queenhornuch Green 1773 (CKS U38 O3) *Fig. 6*

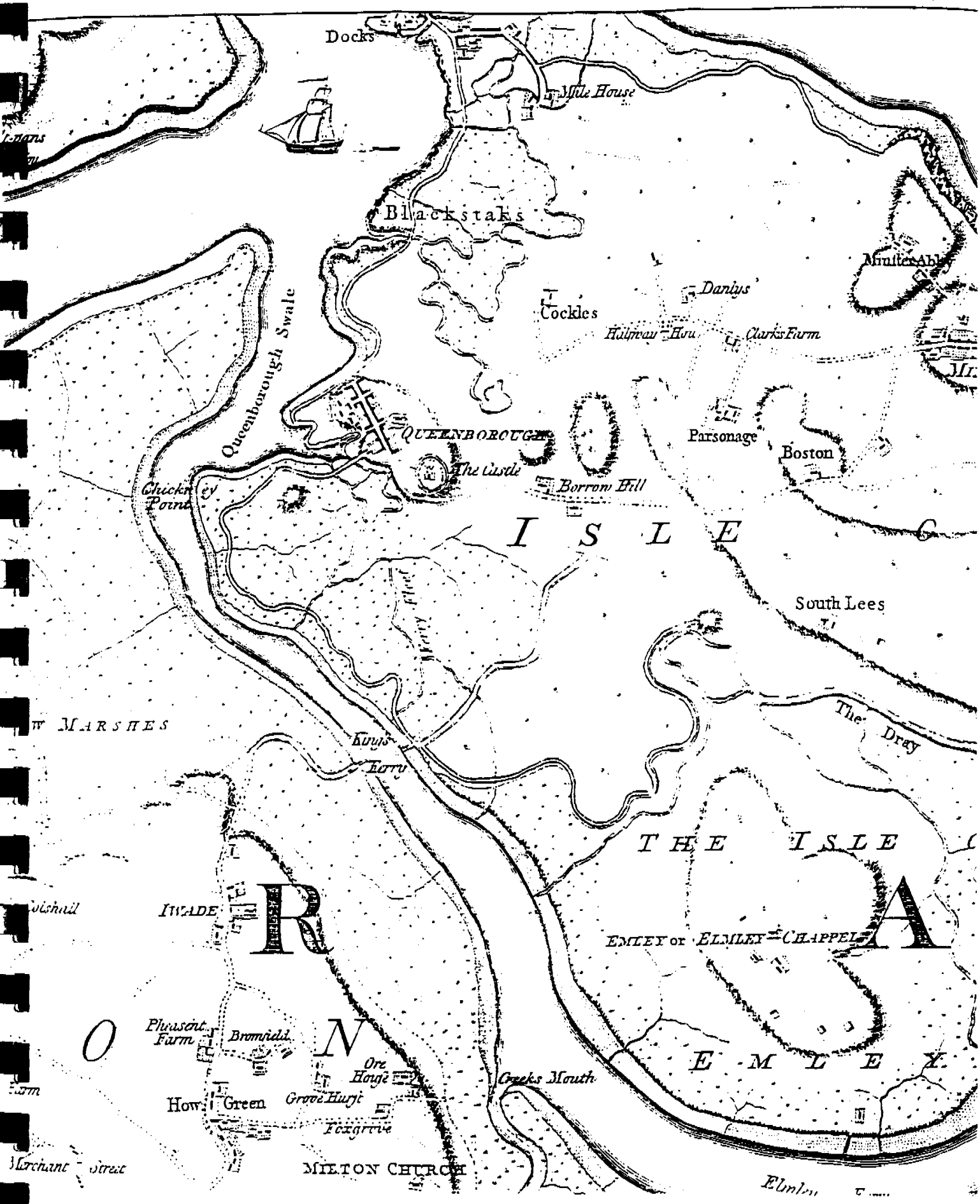


Plan of Neats Court Estate, 1776 (PRO, MPE 369)

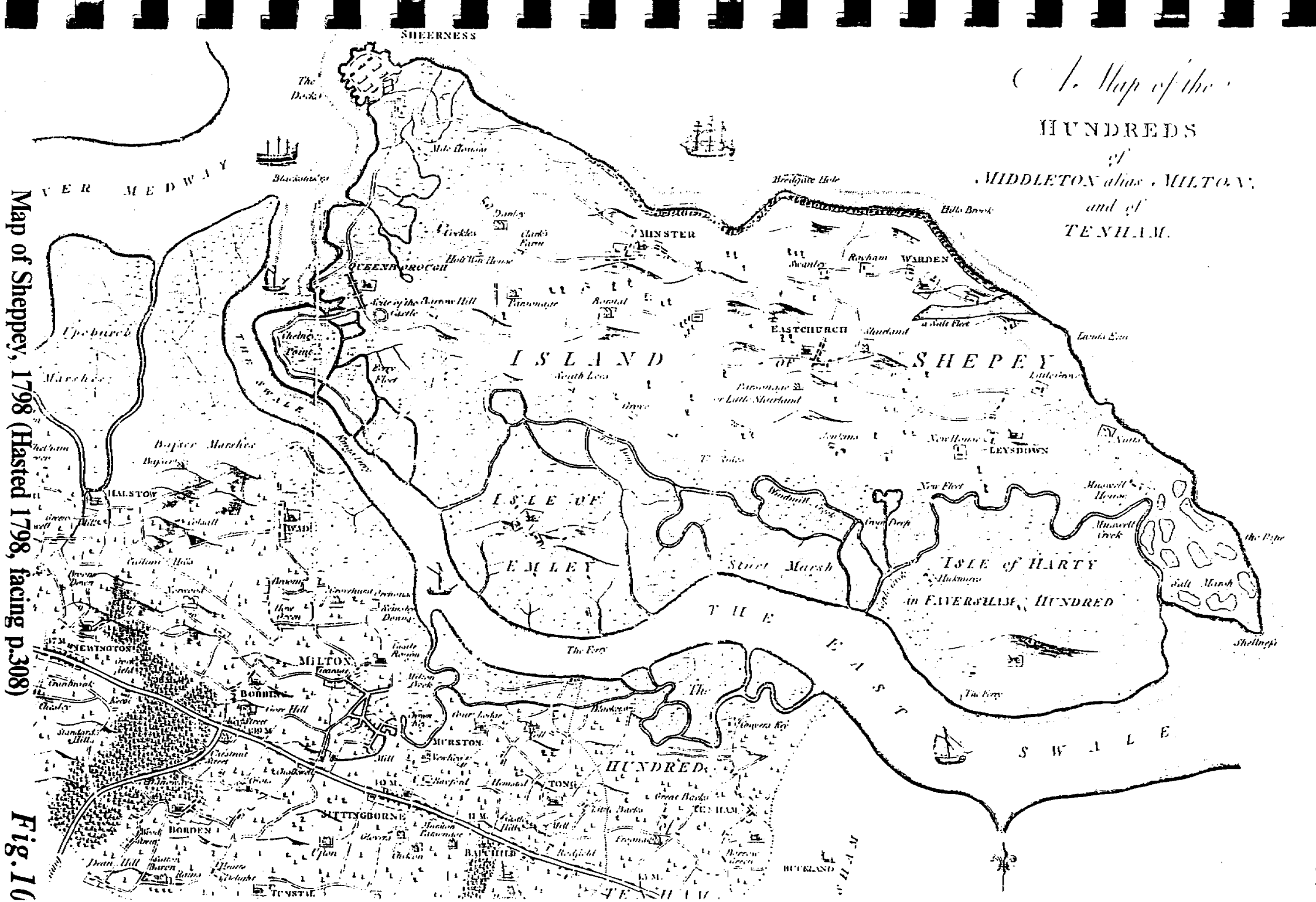
Fig. 7



Map of Sheppey, eighteenth(?) century (Judge 1990, 162) *Fig. 8*



Map of Sheppey, 1769 (Andrews, Dury & Herbert 1769, sheet 8) *Fig. 9*



Map of Sheppey, 1798 (Hasted 1798, facing p.308)

Fig. 10

Fig. II

Map of Sheppey, 1801 (OS 1801)

Map of Sheppey, 1819 (OS 1819)

Fig.12