Part 3: Deposits of local rivers

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Introduction

It has been shown earlier in this chapter that a large part of Essex was, at different times during the Early and Middle Pleistocene, drained by the lower reaches of the Thames. In the Early Pleistocene the Thames flowed across the northwestern part of the county towards Suffolk, and much of Essex was drained northwards towards it (although not necessarily directly into it), the main north-flowing river being the Medway. By the Middle Pleistocene the south-eastward migration of the Thames, possibly aided by diversion or capture by a Medway tributary (Bridgland, 1988a), had resulted in a north-eastward course for the river across Essex to the Tendring Plateau, where it was joined by the Medway (see Part 1 of this chapter). During the Anglian Stage the Thames was diverted, by way of its present valley through London, into the Medway, thus bringing into being the Thames drainage of south-western and eastern Essex. Subsequent migration caused the river to abandon the north-eastern part of this course, although the northward trend is still represented in the offshore continuation of the Late Pleistocene Thames-Medway valley (D'Olier, 1975; Bridgland and D'Olier, 1989; (Figure 5.5)F).

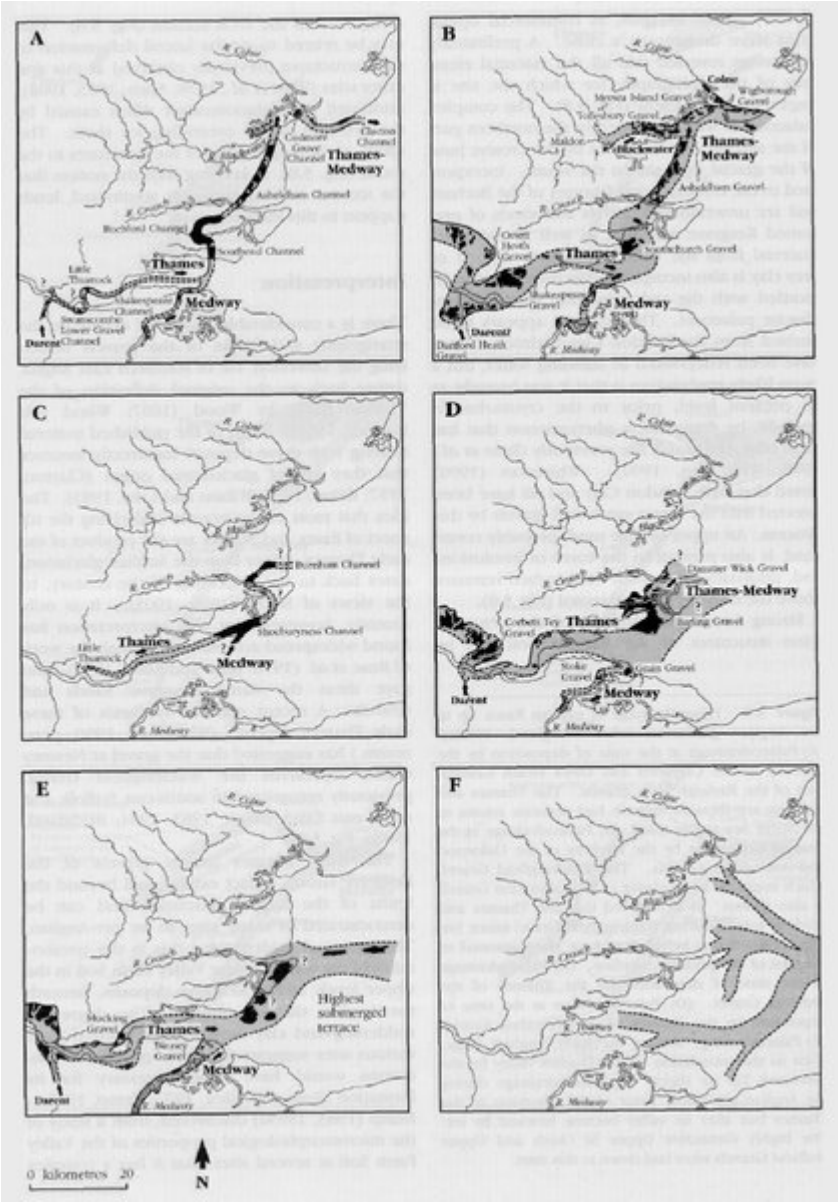
In the latter part of the Pleistocene, as the Thames moved further towards the south and east, new tributary streams were initiated, draining the areas once occupied by the main river. In particular, the Colne appears to have formed in the old beheaded valley of the Kesgrave (Lower St Osyth Gravel) Thames; this former river is presumably the 'misfit' remnant of the pre-diversion Thames itself (see (Figure 5.5)B). The Chelmer and Blackwater also appear to drain parts of the old Thames valley in central Essex ((Figure 5.4)E), the latter flowing in the opposite direction to the Thames. This part of the old valley was apparently modified by glacial activity between its occupation by the Thames and by the later rivers, since considerable thicknesses of till occur in overdeepened sections of it (Bristow, 1985).

The tributary rivers of the northern and western parts of Essex thus appear to have been initiated immediately following the Anglian glaciation. It is therefore not surprising that they have extensive terrace systems of their own (see Geological Survey Sheet 241, Chelmsford), although these have received comparatively little attention from geologists. A number of important Pleistocene sites have come to light within these terrace systems over the years, but it has not always been easy to distinguish the deposits of these rivers from those of the Thames; there has, for example, been uncertainty about whether the deposits in the Clacton area are the products of the Thames or the local River Colne (see above, Clacton). The richest source of hand-axes in Essex, a gravel at Upper Dovercourt [TM 240 313] (Underwood, 1913; Warren, 1933; Wymer, 1985b), appears to be a Stour terrace deposit banked against the much earlier Oakley Gravel, of (pre-diversion) Thames-Medway origin (Bridgland *et al.,* 1990). Most of the Palaeolithic discoveries in the Chelmsford, Maldon and Colchester areas, carefully catalogued by Wymer (1985b), are probably from the terraces of the Chelmer, Blackwater and Colne. Occasionally collections of mammalian bones have also been made from these deposits (Wymer, 1985b). There are a few sites in areas where the gravels are generally believed to be pre-diversion (Kesgrave Group) Thames deposits, but where important fossil or Palaeolithic discoveries raise doubts about this interpretation. One such is near Thorpe-le-Soken (Daking's Pit — [TM 155 233]), where a rich assemblage of artefacts has been recovered from deposits mapped as part of the Cooks Green Gravel (Warren, 1933; Oakley and Leakey, 1937; Wymer, 1985b). A recent reinvestigation has confirmed the presence of abundant worked flakes, but has also shown the gravel to be perceptibly different to the local Cooks Green Formation. In particular, it contains *Rhaxella* chert, which is very rare in the Kesgrave Group gravels upstream of the Crag basin (see Part 1 of this chapter), but is present in the Red Crag and in Anglian Stage glacial deposits. This site lies in the valley of the Holland Brook, which suggests that the gravel may be a post-Anglian deposit laid down by that river.

Three GCR sites are included in this part of the chapter, covering very different areas of interest, although all three are associated with the River Blackwater. The first, Maldon Railway Cutting, is an important site for stratigraphical evaluation of the deposits of the Anglian glaciation, since it is the type locality of the controversial Maldon Till. The other two sites are of Late Pleistocene age, dating from the last interglacial/glacial cycle; they therefore represent a part of the

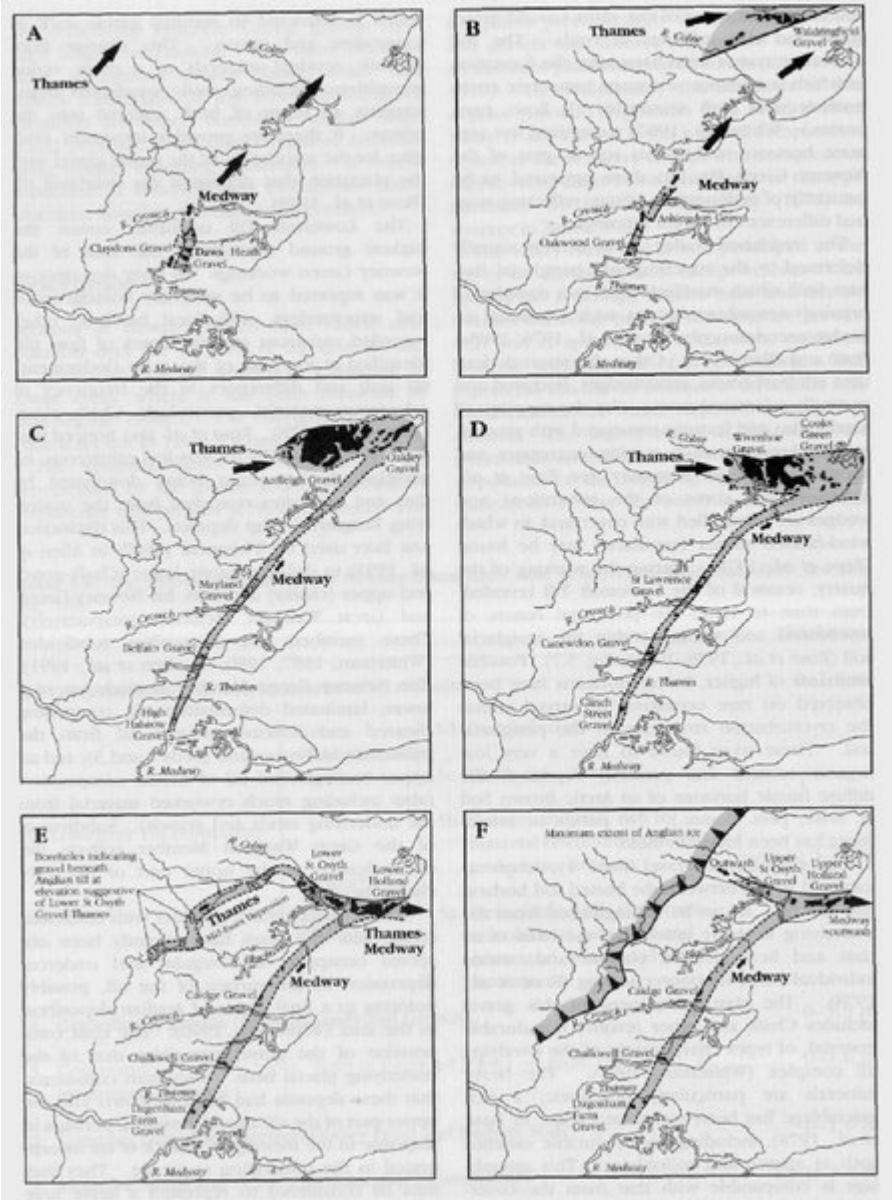
Pleistocene for which no Thames deposits are known in Essex (if the various Lower Thames interglacial sites are correctly interpreted as pre-Ipswichian in Chapter 4). The Ipswichian Stage (*sensu* Trafalgar Square) is represented by hippopotamus-bearing deposits at East Mersea, while a site in a low terrace of the Blackwater at Great Totham has yielded an abundance of palaeontological data that suggests deposition during the Devensian Stage.

References



(Figure 5.5) Palaeodrainage of Essex following the Anglian glaciation (modified from Bridgland, 1988a). (A) Palaeodrainage during the filling of the Southend/Asheldham/Clacton Channel. The Swanscombe Lower Gravel Channel and the Cudmore Grove Channel are both thought to be lateral equivalents. The Rochford Channel is now thought to represent an overdeepened section of the same feature (see text). This channel was excavated in the late Anglian by the newly diverted Thames and filled during the Hoxnian Stage (sensu Swanscombe). (B) Palaeodrainage during the deposition of the Southchurch/Asheldham Gravel.. This aggradational phase is believed to have culminated during the earliest part of the Saalian Stage, early in Oxygen Isotope Stage 10. (C) Palaeodrainage during the filling of the Shoeburyness Channel. The channel beneath the Corbets Tey Gravel of the Lower Thames is believed to be an upstream equivalent of this feature. It is thought that both the excavation and filling of the channel were intra-Saalian events, dating from Oxygen Isotope Stages 10 and 9 respectively. (D) Palaeodrainage during the deposition of the Barling Gravel. This is regarded as an intra-Saalian deposit, aggraded during Oxygen Isotope Stage 8. (E) Palaeodrainage during the deposition of the Mucking Gravel of the Lower Thames. The Thames-Medway equivalent of this formation is buried beneath the coastal alluvium east of Southend and can be traced offshore (Bridgland et ed., 1993). This aggradational phase occurred towards the end of the complex Saalian Stage, culminating early in Oxygen

Isotope Stage 6. (F) Palaeodrainage during the last glacial. The submerged valley of the Thames-Medway has been recognized beneath Flandrian marine sediments in the area offshore from eastern Essex (after D'Olier, 1975).



(Figure 5.4) Palaeodrainage of eastern Essex up to the Anglian glaciation (after Bridgland, 1988a): (A) Palaeodrainage at the time of deposition by the Medway of the Claydons and Daws Heath Gravels, part of the Rayleigh Hills gravels. The Thames and Medway are thought to have had separate routes to the North Sea at this time. (B) Palaeodrainage at the time of deposition by the Medway of the Oakwood and Ashingdon Gravels. The Waldringfield Gravel, which might be a correlative of the Ashingdon Gravel, is also shown. It is believed that the Thames and Medway joined during Waldringfield Gravel times, but this confluence is believed to have been situated to the east of the present coastline. (C) Palaeodrainage at the time of deposition by the Thames of the Ardleigh Gravel. (D) Palaeodrainage at the time of deposition by the Thames of the Wivenhoe Gravel. (E) Palaeodrainage during the early Anglian Stage, prior to the inundation of the Thames valley by the Lowestoft Till ice sheet. (F) Palaeodrainage during the Anglian glaciation, prior to the diversion of the Thames but after its valley became blocked by ice. The highly distinctive Upper St Osyth and Upper Holland Gravels were laid down at this time.