Stutfall Castle, Lympne, Kent

[TR 117 345]

Introduction

Romney Marsh in Kent is backed by an abandoned marine cliff (Figure 7.25) (May, 2003). The cliff has been degrading by a process involving several types of mass movement since isolation from wave action by the growth of Romney Marsh. For example, The Roughs, a site in the Hythe Beds between Hythe and West Hythe, has 17 separate landslide scars, with lobate features in the accumulation zone down-slope. Stutfall Castle, at Lympne, is the remains of a Roman fort built in AD 280, which has broken up under the influence of these mass movements. The bastions which constitute the remaining fragments of the fort have moved relative to the crest and foot of the slope, and relative to each other, throwing light on the nature and effects of mass movements on the slope of the degraded cliff over the 1600+ years since the fort was abandoned by its last occupants.

Abandoned cliffs undergo successive changes following the cessation of erosion at their foot. Studies aimed at describing and explaining these changes have concentrated on locations where a cliff has been successively abandoned along its length, either by the growth of a coastal spit along a coastline (e.g. Savigear, 1952) or by the migration of a river meander (Brunsden and Kesel, 1973). The 'ergodic hypothesis' (substitution of space for time) is used to elucidate the probable sequence of events at any particular point along the cliff-line. At Stutfall Castle a different approach has been adopted: the abandoned cliff has been subject to investigation by a combined team of geotechnical engineers and archaeologists (Hutchinson *et al.,* 1985), in the expectation that the archaeology of the fort would throw light on the later stages of land-sliding and slope development (and that geotechnical investigation would illuminate some of the archaeological problems of the site). Previous excavations of the fort had been carried out by Roach Smith (1850, 1852), and by Cunliffe (1980a).

The crest of the slope is capped by the Hythe Beds, which form a plateau to the north. These are underlain thinly by Atherfield Clay, but most of the cliff slope is formed in Weald Clay, which is estimated to extend to about 70 m below the slope foot (Smart *et al.,* 1966). The regional dip is 1°–2° to the NNE or north-east.

Description

The slope at Lympne is part of an extensive abandoned marine cliff, protected from marine erosion by Romney Marsh and its associated shingle spits. The cliff extends about 8 km from Hythe, 3 km to the east of Lympne, continuously to Appledore, 18 km to the west, and then discontinuously southwards to the coast 5 km to the east of Hastings (Figure 7.25). It is of fairly constant height, at about 90–100 m above OD. There is a tendency for the average steepness and signs of instability to increase from west to east, which may result from geological changes, but suggests that active marine erosion ceased more recently in the eastern parts. For example, The Roughs, close to the eastern end of the abandoned cliff, shows signs of current instability (Brunsden *et al.,* 1996a).

At Lympne the abandoned cliff has a height about 100 m above the marsh at its foot. The present slope profile comprises two main elements: at its head is a 15 m-high scarp in the Hythe Beds, standing at 35°, below which a 550 m-long, slightly irregular slope, predominantly in Weald Clay, extends down to the marsh at about 9°. The 9° slope can be divided into an upper degradation zone and a lower accumulation zone. The degradation zone possesses marked cross-slope undulations, characteristic of landsliding. The accumulation zone is smoother. The fact that the average slope angles of the degradation and accumulation zones are virtually identical indicates that the slope has developed to a condition of long-term stability so that, under present conditions of climate and vegetation, further landsliding is unlikely (Hutchinson *et al.,* 1985). This is in contrast with The Roughs, 1 km to the east along the Hythe Beds escarpment, which is still showing signs of active degradation and has not yet reached the angle of ultimate stability (Brunsden *et al.,* 1996a).

In the accumulation zone a sheet of shallow landslide debris and hillwash obscures the traces of the earlier, more deep-seated landslides which dislocated the fort. Three significant features may be identified (see (Figure 7.26)), using the combined evidence of the slope morphology and the remains of the fort:

1. A scarp, S1, which runs beneath the north wall of the fort, cuts across the north-west wall and can be inferred to have transected the north-east wall. This represents the rear scarp of the slide termed the 'main landslide' (Hutchinson *et al.,* 1985), which chiefly disrupted the fort.
2. A lobe that projects well into the marsh between stream X and point K. This is associated with the toe of a 'south-east slide' which caused additional displacement and damage in much of the east wall of the fort and the eastern part of its south wall.
3. A pronounced lobe which encroaches on the north-east corner of the fort, forming the toe of a 'north-east slide'. This appears to cover the eastward continuation of scarp S1 and is therefore inferred to be the later event.

The toe of the slope is fronted by the extensive post-glacial, littoral and alluvial accumulations of Romney Marsh.

Descending the cliff slope at intervals along the slope of 100–150 m, is a succession of streams originating from the spring line near the crest. One of these, 'stream X' (Figure 7.26), runs through the eastern part of the fort ruins.

Interpretation

By analogy with other degraded cliffs (e.g. Hutchinson and Gostelow, 1976) it was expected that the area immediately below the crest of the escarpment would be occupied by the remains of rotational slips, consisting of back-tilted masses of Hythe Beds over Atherfield Clay, and possibly also Weald Clay. Geotechnical investigations (including boreholes) showed, however, that instead the area is occupied by a fairly level bench, Q (Figure 7.26), which a 2.5 m-deep pit showed to consist of 2.2 m of loose loam, with flecks of charcoal, over Hythe Beds debris. Hutchinson *et al.* (1985) concluded that this bench was produced in the course of quarrying of the slipped, and possibly also the in-situ, Hythe Beds in that vicinity for building materials. As Stutfall Castle is constructed predominantly of Hythe Beds material, for which this bench is the nearest accessible source, they consider it likely that the quarrying dates from the construction of the Roman fort.

From the quarry bench to about halfway down the main slope, the ground is mantled by a thin sheet of landslip debris, varying between 1.5 m and 3.5 m in thickness, which shows evidence of part successive-rotational, part translational slipping. This sheet thickens to around 8 m or 9 m from about 30 m downslope of the line of the north wall to just below Bastion 3.

In the main part of the accumulation zone, the landslide debris thickens further to nearly 20 m where it buries a former sea cliff, cut into the in-situ Weald Clay during the last phase of strong marine erosion. The sub-surface investigations define the position and form of this cliff and also show the extent to which the associated beach and alluvial deposits have subsequently been over-ridden by landsliding (Figure 7.27). The crest of the former sea cliff is situated just downslope of the present position of Bastion 3: its foot is a further 35 m downslope. Since erosion ceased there, the landslide debris has advanced approximately 130 m seawards of that point. The buried cliff is fronted by a shore platform, also formed in the Weald Clay. This is sub-planar and declines slightly towards the south. At its contact with the buried cliff it has an elevation of 1.0 m below OD. Overlying the shore platform is an irregular spread of alluvial silts, and littoral sands and gravels, often shelly, up to 3.8 m thick (Figure 7.27).

The absence of periglacial solifluction features on the Lympne slope, in contrast to their presence on the geologically analogous escarpment at Sevenoaks, Kent (Skempton and Weeks, 1976) indicates that marine erosion ceased at its foot after the Younger Dryas period of the Late-glacial (10 850–10 050 BP). A radiocarbon date of 4400 ± 50 years BP on a piece of waterlogged wood recovered from the landslip debris just above the foot of the buried cliff (Figure 7.27), suggests that the cliff was abandoned around 4000 BP Since then the slope has developed chiefly through the burial of the cliff and the re-establishment of the accumulation zone by the supply of debris from the degradation zone upslope. This process must have been relatively far advanced when the Romans chose the site for the fort.

The previous archaeological excavations had not exposed the foundations of the fort. Hutchinson *et al.* (1985) used a tracked excavator to dig eight trenches, each about a metre wide and with one exception they were taken down into the weathered surface of the Weald Clay, 3–4 m below ground level. The northern walls of the fort enabled the investigators to establish the relationship of the Roman foundations to the landslide debris and the in-situ strata. Thirty timber piles were exposed in the floor of one of these trenches, in an area of about 0.9 x 5.0 m. Most of the piles were about 3 m in length. The northernmost of the piles, and those nearest to it, were close to vertical, but those to the south leant successively more and more downslope so that in the southern part of the trench, they occupied sub-horizontal positions. It was evident that the piles, each sharpened to a point at the lower end, had originally been driven and emplaced vertically. The increasing forward tilt of the piles towards the southern end of the trench was produced by the sliding downhill over them of the wall which they had supported (Figure 7.28). The wall slid downslope for a distance of about 5.5 m, tilting forward in the process, and leaving its piles behind. Similar observations and measurements at other trenches enabled the original positions of the bastions and walls of the fort to be identified, and so the original shape and size of the fort was reconstructed (Figure 7.29).

The date (or dates) of the landslides which disrupted the fort are not easily established, but clearly they post-date the construction of the fort. According to Cunliffe (1980a) two classical texts refer to the fort, enabling it to be identified as *Portus Lemanis:* the Antonine Itinerary, compiled in the early third century, mentions Portus Lemanis, while the *Notitia Dignitarum* records that the *numerus Turnacensium,* a military detachment, was stationed at Lemanis in the fourth century. Cunliffe (1980b) has made a preliminary assessment of the state of Romney Marsh in the first millennium AD, arguing that in the early part of the Roman period the rivers Rother, Tillingham and Brede flowed into an extensive estuary that opened to the sea through a narrow outlet just to the east of the site of the fort (see (Figure 7.30)). The first historical account of the fort seems to be that of John Leland (published 1744), who observed, some time in the period 1535–1543, that the structure was then already ruined. The archaeological evidence concerning the period of the fort's abandonment is supported by what Cunliffe (1977, 1980a) describes as tenuous arguments. Based in part on the assemblage of pottery sherds found at the site (Young, 1980), it suggests that the fort was abandoned earlier than the Romans' other Saxon Shore forts, in *c.* AD 340–350 (Cunliffe, 1980a). Hutchinson *et al.* (1985) remark that it is tempting to ascribe this early abandonment to the commencement of landsliding in the fort. However, further evidence suggests that the slipping of the fort walls took place at a later date.

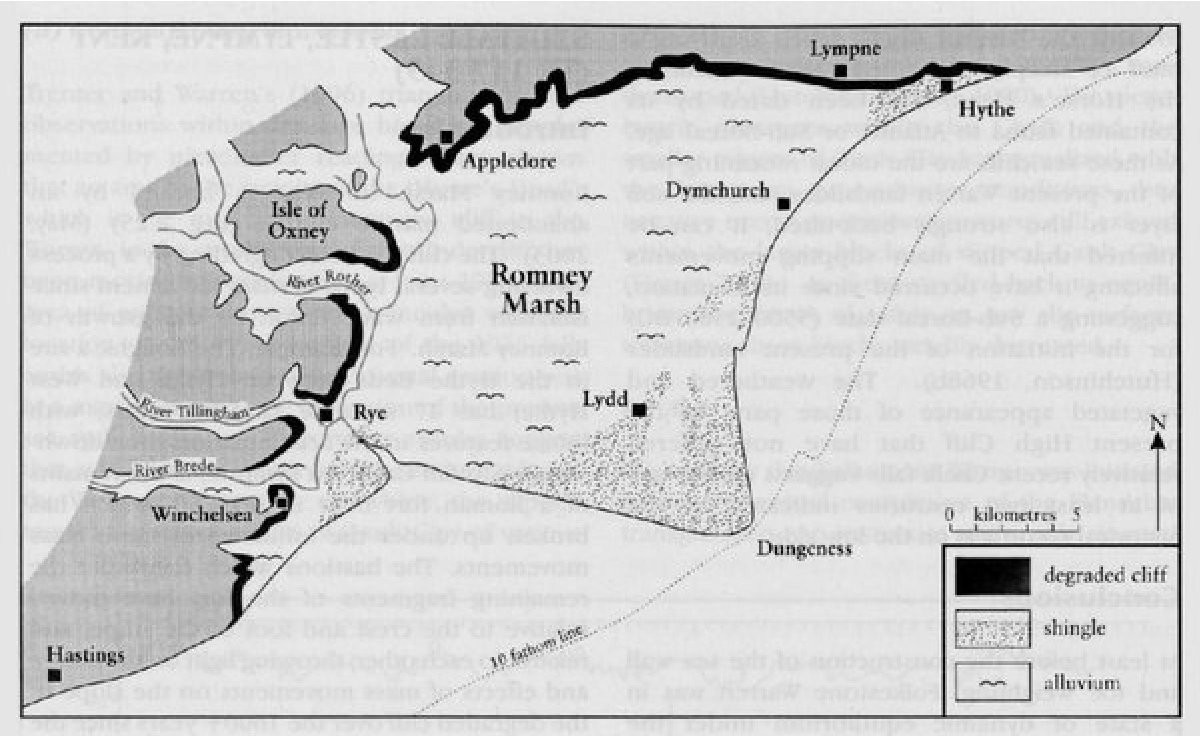
Hutchinson *et al.'s* (1985) investigations reveal that at Borehole 1 (see (Figure 7.27)) the marsh surface at 2.8 m above OD is underlain by 4.4 m of silty alluvium, which rests on a Roman beach at 1.6 m below OD. In section, the slide toe is shown to be double. The first phase of sliding, associated with the destruction of the fort, occurred when about 2.6 m of silt had accumulated above this beach. The second phase, involving movements in a shallower surface mantle, over-rode the marsh surface. Taking a nominal date of AD 300 for the commencement of siltation, and Cunliffe's (1980a) date of *c.* AD 700 for the cessation of sedimentation in this locality, Hutchinson et al. (1985) estimate the date of the first phase of sliding at around AD 540 (assuming a steady sedimentation rate). The second phase is, evidently, post AD 700. Bearing in mind the assumptions involved, Hutchinson *et al.* (1985) estimate tentatively that the landslides which disrupted the fort occurred in the sixth century AD, and that these were followed, after the end of the seventh century AD, by shallower movements of the surface mantle. Clearly the morphology of the currently visible toe of the landslides is a result only of these latter, second phase movements.

A definite trigger for the main sliding has yet to be identified. It is not clear, despite the intimate association of some of the sliding with the fort, whether its initiation was natural or the result of human activity.

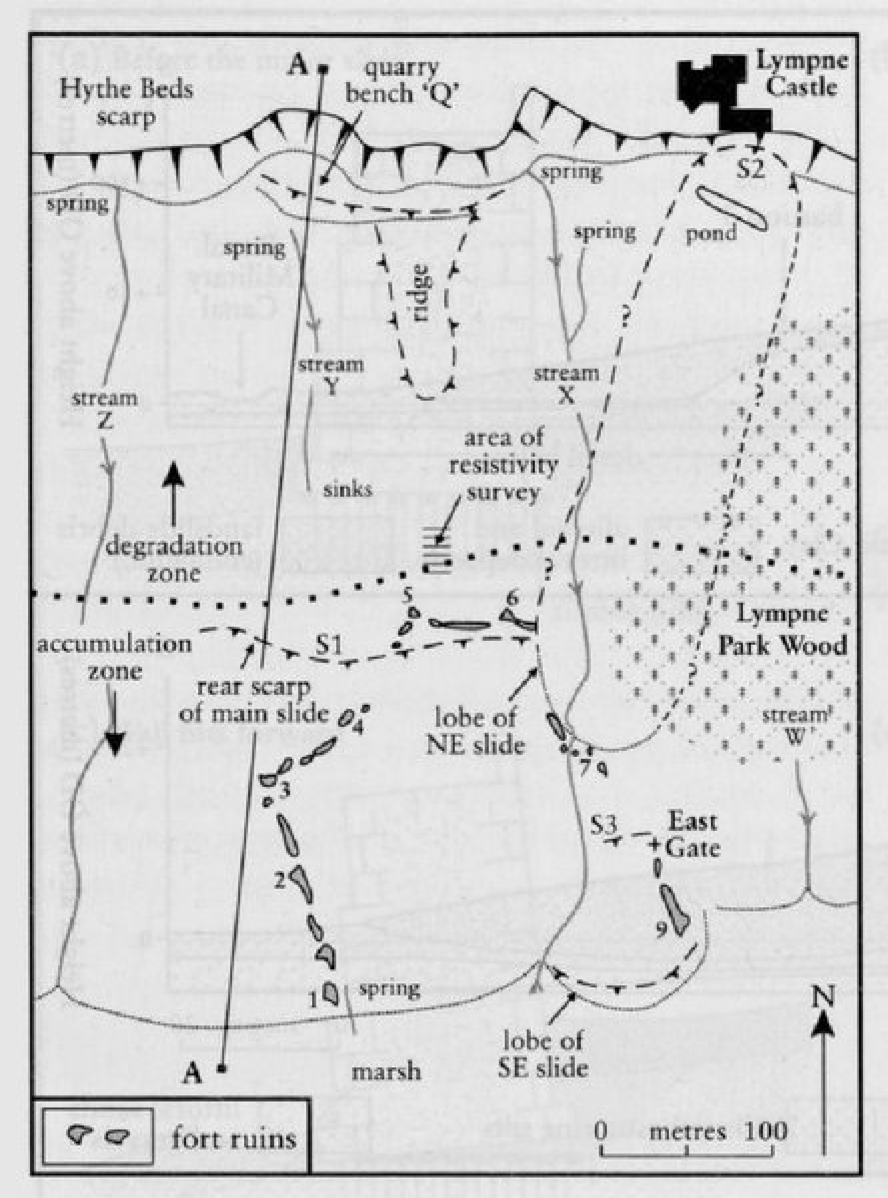
Conclusions

The Stutfall Castle site may be compared with the site at Hadleigh Castle where there is also an abandoned marine cliff and a ruined castle. However, the quality of geological information derived from the archaeological excavation at Lympne is of greater significance in the understanding of the Lympne slope than is the case with Hadleigh Castle's role in the understanding of the Hadleigh slope. In particular, the fact that the development history of Romney Marsh is so well understood, and closely tied down to historically identifiable periods, increases the conservation value of the Lympne site. These two studies have, however, led to the development of an important model of slope degradation through time and a deepened understanding of slope evolution processes following the removal of basal erosion and debris removal.

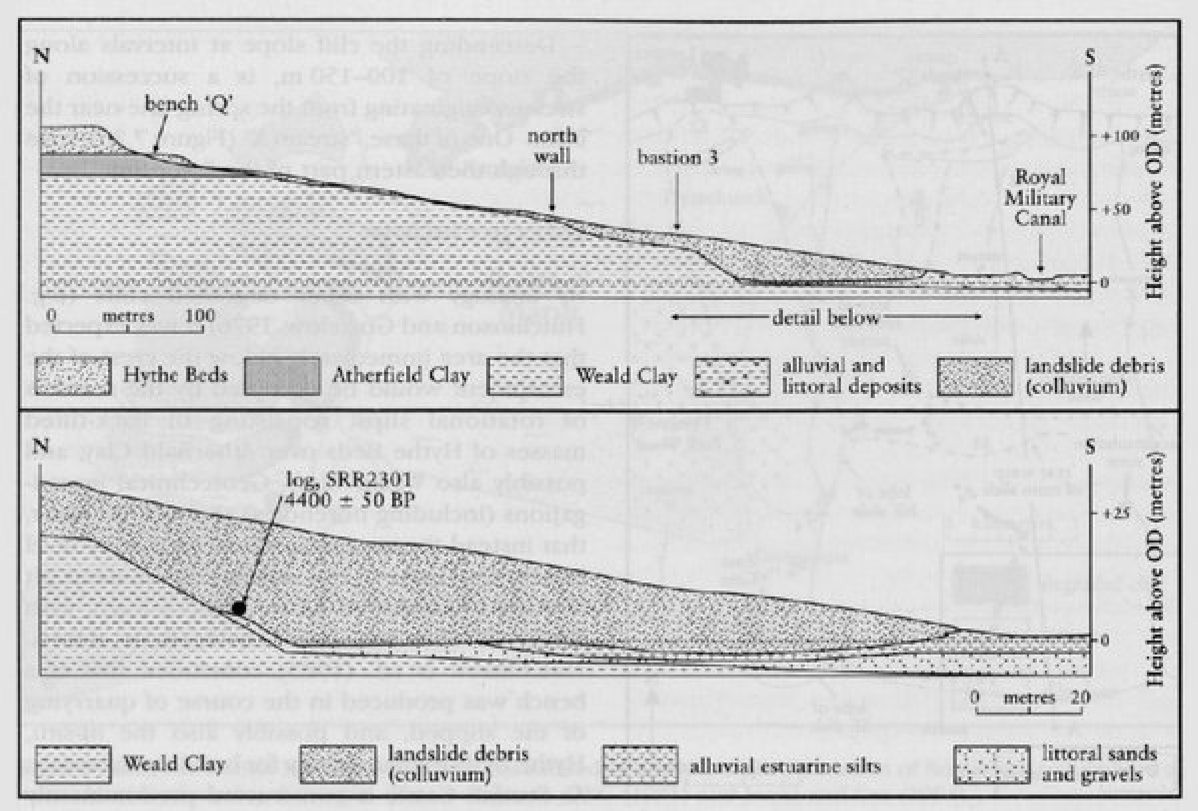
[References](#)



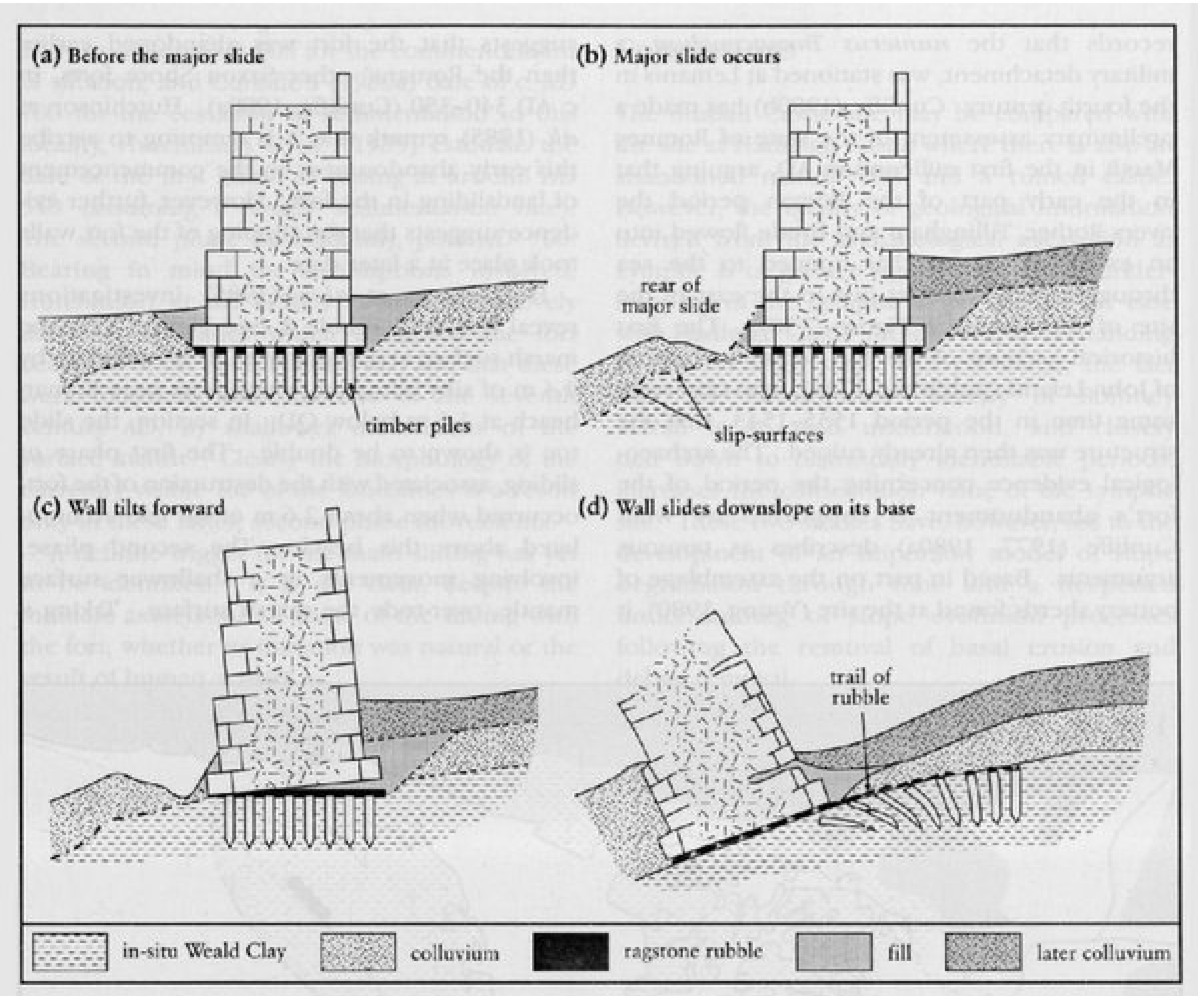
(Figure 7.25) The former sea cliff which was abandoned as a result of the formation of Romney Marsh behind a major barrier of sand and shingle. Based on Jones, DKC (1981) and Jones and Lee (1994).



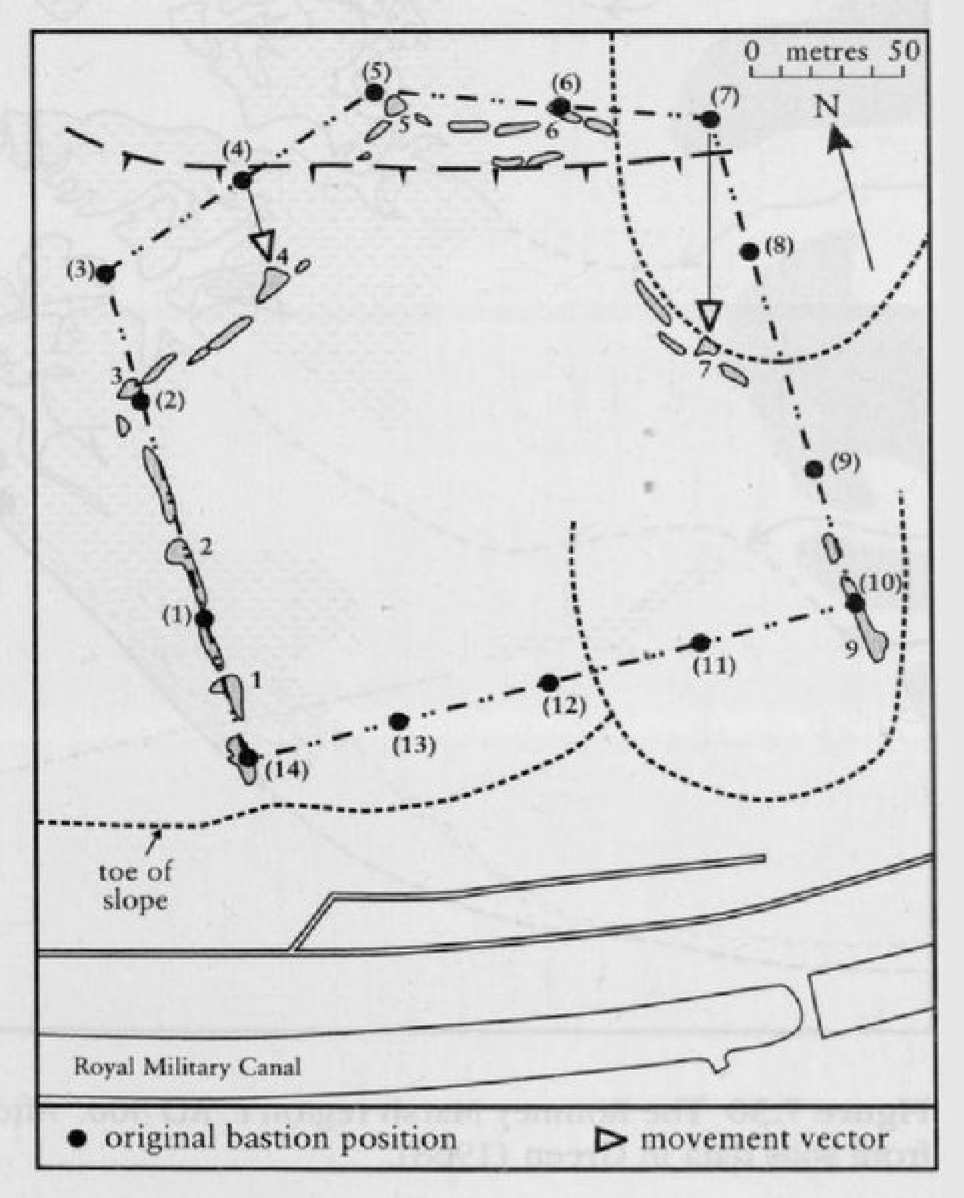
(Figure 7.26) Geomorphology of the Stutfall Castle GCR site. The ruins of the fort are stippled. Numbers 1–7 and 9 are Bastion Numbers. After Hutchinson et al. (1985).



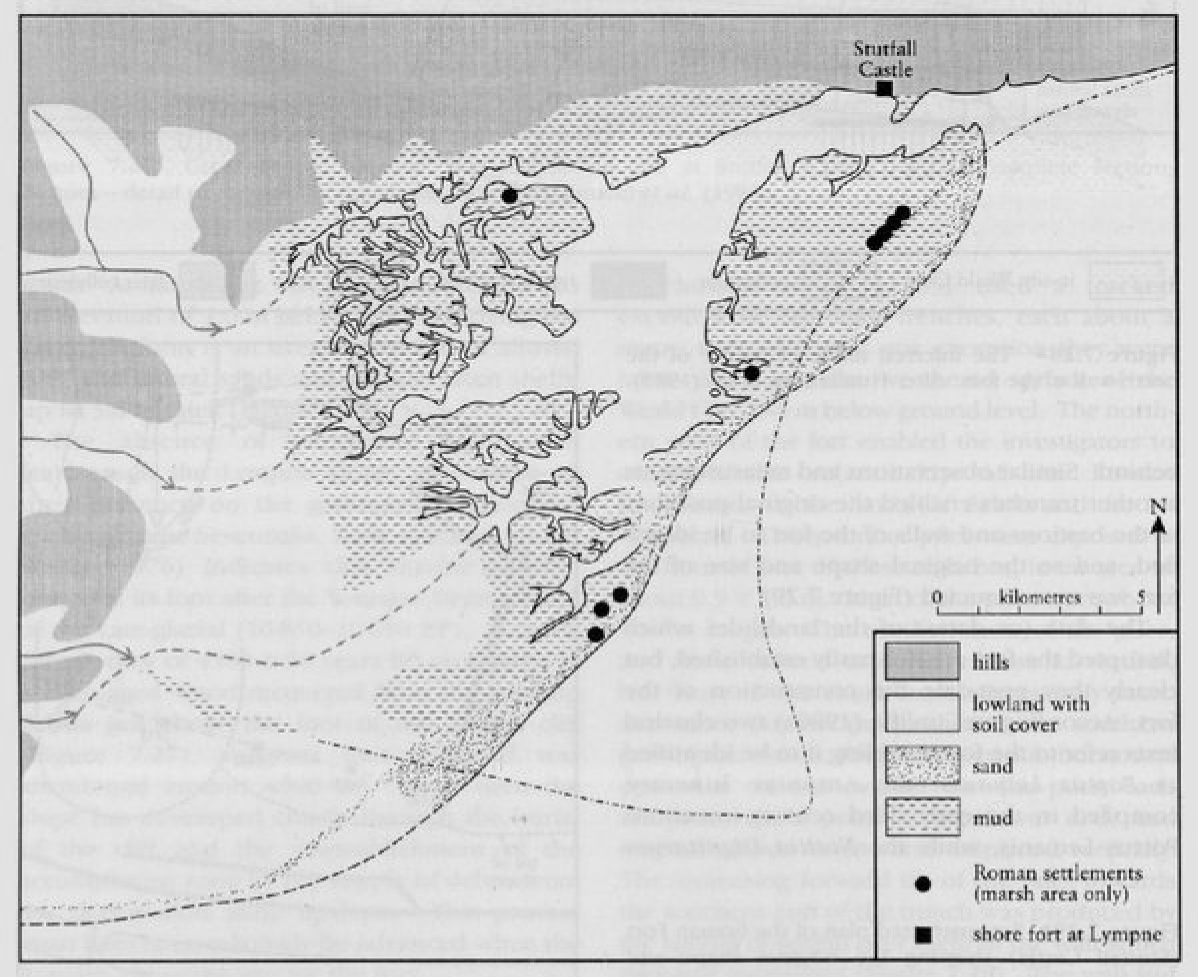
(Figure 7.27) Cross-sections through the abandoned cliff at Stutfall Castle. Top — complete section; Bottom — detail of the base of the slope. After Hutchinson et al. (1985).



(Figure 7.28) The inferred mode of failure of the north wall of the fort. After Hutchinson et al. (1985).



(Figure 7.29) Reconstructed plan of the Roman Fort (Stutfall Castle) showing the original shape and absolute position of the central parts of the northern walls and the inferred outline of the remainder. After Hutchinson et al. (1985).



(Figure 7.30) The Romney Marsh region c. AD 300. After Cunliffe (1980a); details of creeks inferred by Cunliffe from soils data in Green (1968).