7. Recent Geotechnical,Geomorphological and Archaeological Investigations of the Abandoned Cliff backing Romney Marsh at Lympne, Kent

John Hutchinson

Introduction

During 1980 to 1982, a series of investigations was carried out on the impressive abandoned cliff of Weald Clay which backs Romney Marsh. The principal objective was to throw light on the geology and geotechnics of this feature and to explore the history of its erosion, landsliding and slope development in relation to that of the Marsh. Accordingly, it was decided to concentrate the investigations at Lympne, in the area occupied by the Roman fort known as Stutfall Castle, itself severely disrupted by landslides, in the hope that the archaeology of the fort would throw light on the later stages of the development of the slope. This note summarises the results of that work which are of most interest in the present connection. A fuller account of the combined archaeological and geotechnical work is given by Hutchinson et al., 1985. A more detailed geomorphological and geotechnical paper is in preparation.

Geology and Geomorphology

The 100 m high abandoned cliff at Lympne consists almost entirely of Weald Clay, overlain thinly by the Atherfield Clay, which is in turn capped by the Hythe Beds. The regional dip is between 1° and 2° to the north-north-east or north-east.

Beneath the steep scarp of the Hythe Beds, the slope descends at around 9° to the surface of Romney Marsh. An undulating degradation zone can be distinguished in the upper parts of the slope and a smoother, accumulation zone in the lower parts. As these zones are of a similar inclination, which coincides with the estimated angle of ultimate stability against landsliding for the Weald Clay, the slope is considered to be essentially fully developed. (It remains very sensitive to disturbance by building or earthworks, however, which would tend to re-activate the complex of old landslides present.) This view is supported by the historical evidence, which shows that the last known landslide in this vicinity was that at the slope crest, slightly to the west of Lympne at the “French House”, in about 1725 (Collinson 1728; Gostling 1756).

Results of Sub-Surface Investigations

Twenty-two boreholes and fourteen trial trenches were put down on a section immediately west of Stutfall Castle with the results summarized in Fig. 7.1. The main finding is the existence of a fairly steep former sea-cliff, cut in the Weald Clay and now buried by more than 20 m of landslide debris. Preliminary indications, based largely on a radiocarbon dating of $4400 \pm 50$ BP on a log (family Rosaceae, sub-family Pomoideae; Dr. P. Gasson, personal communication) found near the foot of the old cliff (Fig. 7.1), are that this was abandoned around 2000 BC. (The presence of fusain (mineral charcoal), derived from the Wealden, complicates some of the other radiocarbon determinations.) Since that time, much landsliding has taken place. This has resulted in the build-up of a considerable wedge of debris at the toe of the slope, which has overriden the former Weald Clay shelf platform and its associated littoral and alluvial deposits by about 130 metres (Fig. 7.1).

From the investigation of the landslides disrupting the fort, it has been established that in Roman times the toe of the slope was 35 m or more further to the north than at present. Close investigation of the toe shows that it is double, partly intercalating with, partly overriding the alluvium of the Marsh (T in Fig. 7.1). A similar feature was found by Cunliffe (1980). A very approximate dating of the lower toe by Hutchinson et al. (1985) suggests that this may have formed in the sixth century AD.

The mantle of landslide debris in the degradation zone is unusually thin, doubtless because the debris there has slid down over the old sea-cliff to fill the space formed by the last episode of marine erosion. The absence of back-tilted slipped masses of Hythe Beds (which are very evident to east and west of the section explored) from the upper slopes is believed to be the result of their being quarried by the Romans to obtain stone for the walls of the fort (Hutchinson et al. 1985).

Concluding Remarks

It has been noted earlier (Hutchinson 1965), that on the abandoned cliff behind Romney Marsh there is a tendency for the average inclination and evidence of
instability to increase from west to east, suggesting that marine erosion ceased more recently in the eastern parts of the cliff. In future work, it would be interesting to explore this matter in more detail and to investigate further the relationships between colluvium and alluvium along the cliff foot, which are likely to illuminate the history of both the cliff and the adjoining Marsh.

References