
Chapter 6 Mass-movement sites in Jurassic strata

Introduction

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The Jurassic strata in Britain (Figure 6.1) are susceptible to large-scale mass movements. Of the ten sites chosen for evidence of deep-seated slipping in Lower Jurassic strata, four have a substantial over-burden of non-Jurassic rocks that are also involved in the slides: in the Axmouth to Lyme Regis Undercliffs Nature Reserve (Axmouth–Lyme Regis GCR site) these are Cretaceous sediments, whereas at mass-movement sites on the Trotternish Escarpment on the Isle of Skye Paleocene lavas form a dramatic caprock. All of these sites are examples of the classic cases of failure where thick permeable strata overlay relatively impermeable argillaceous strata. The exception is at Hallaig on the Isle of Raasay, where the landslide is entirely in Jurassic strata, but at this site other factors may have had a greater influence than stratigraphy or lithology.

The Lower Jurassic scarps through central England have been subject to cambering, valley-bulging and an attendant suite of features. These were first recognized in the Jurassic strata of the Northamptonshire Ironstone Field (Lapworth, 1911; Hollingworth *et al.*, 1944), but no Northamptonshire sites now provide good exposures of these features. Dip-and-fault structures can be seen in Jurassic strata at the Entrance Cutting at Bath University GCR site, and ridge-and-trough features can be seen in Jurassic strata at Postlip Warren, near Cheltenham. The site chosen to illustrate valley-bulge structures (Rowlee Bridge) has been described in Chapter 5, as it is in Carboniferous strata.

Illustrating the effects of the Lower Jurassic consisting largely of highly mobile clays, Black Ven is a landslide that is in the process of being actively degraded by mudslides, but episodically rejuvenated by other processes. It is formed in the Lower Jurassic argillaceous beds overlain by the Cretaceous Upper Greensand.

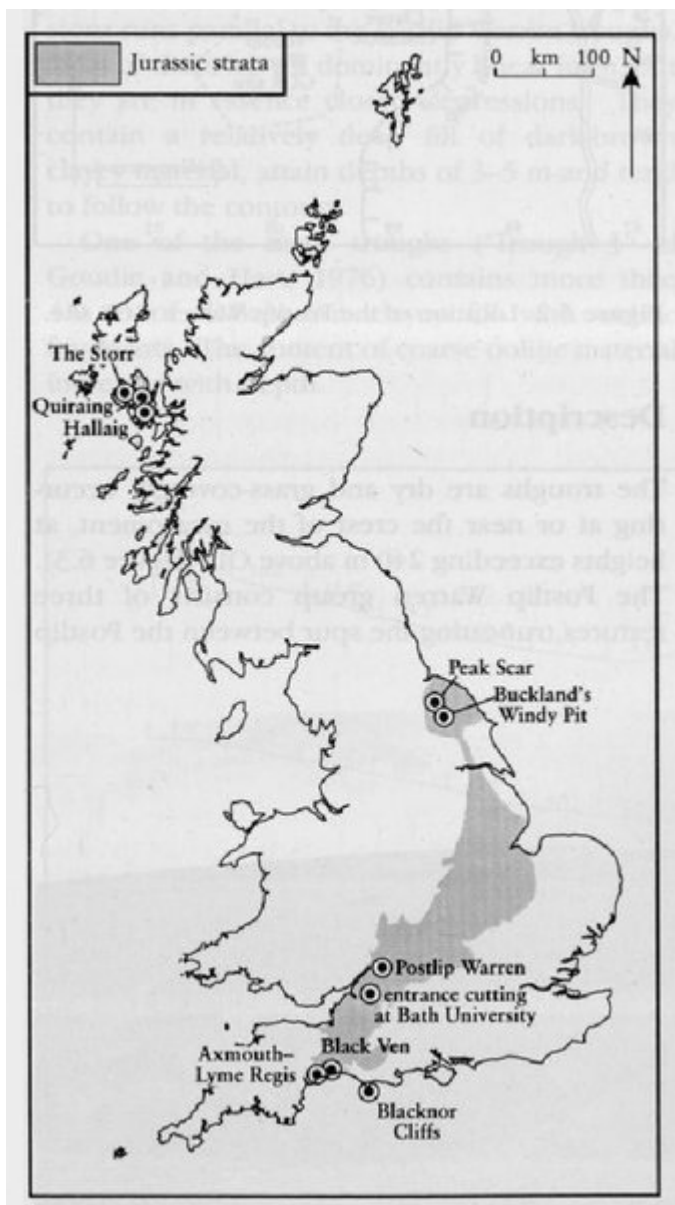
Large-scale superficial structures are also found in Upper Jurassic strata. Three sites, Buckland's Windypit and Peak Scar in North Yorkshire and Blacknor Cliffs on the Isle of Portland, give a broader impression of the types of mass movement in Jurassic strata. At Blacknor Cliffs clay extrusion and deep-seated settlement followed by rotation is typical. At Peak Scar the main mechanism is toppling.

The survey of landsliding (Jones and Lee, 1994) records 2236 examples in Jurassic strata, of which 55% are of unspecified type. The most common types are successive rotational slips (21% of those where the type is specified) and cambered/founded strata (20%). The portmanteau classification type 'complex' accounts for 17% and single rotational slips for 13%. At the opposite extreme, 0.5% are topples, and no records of sags were obtained from Jurassic strata. The latter point is surprising: the Jurassic rocks in and around Dundry Hill, south of Bristol, are recorded by the British Geological Survey as 'founded strata' because of the complexity of their superficial structures; this term suggests that the superficial structures are likely to include sags.

Thirty percent of the slides in Jurassic strata are recorded as having taken place in the Upper Lias, with the Inferior Oolite at 18%, the Middle Lias at 15% and the Lower Lias at 14%. Of the Upper Lias slides, 48% are of unspecified type, but of those where the type is specified, two types predominate: successive rotational slips (28%) and cambered slopes (24%) (Jones and Lee, 1994).

For convenience, the GCR sites selected are discussed here in two sections, covering the Lower Jurassic strata and the Upper Jurassic strata respectively.

[References](#)



(Figure 6.1) Areas of Jurassic strata (shaded) and the locations of the GCR sites described in the present chapter. The Storr and Quiraing lie within the larger Trotternish Escarpment GCR site.