Canyards Hills, Sheffield

[SK 250 948]

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Introduction

The Canyards Hills GCR site is an area of irregularly ridged ground downslope from a 10 m-high vertical scar, in the Ewden Valley, south of Broomhead Reservoir, near Bradfield in South Yorkshire. The ridges are the complex physiographical expression of a large landslip, 1 km long from west to east, extending downslope from the scar for at least 0.4 km (Figure 5.19).

Canyards Hills is in the upper part of the Millstone Grit succession (Namurian, Upper Carboniferous), but higher in the succession than at Mam Tor or Alport Castles. The site is formed in Beacon Hill Flags and the Huddersfield White Rock, with a thick series of shales in between (Elliott, 1979). South-east of Wigtwizzle (Wightwizzle) the Huddersfield White Rock forms a gently sloping plateau with a steep northern scarp face. The north-easterly dip is causing the rock to slip over the underlying shales, and great masses of slipped material cover the slopes below (Figure 5.20). The western part of the plateau has been reduced by this process of denudation to a tongue of high ground only 180 m wide (Bromehead *et al.,* 1933). The Huddersfield White Rock exposed in the scar consists of massive well-bedded and open-jointed sandstones less than 30 m thick, dipping 6° northeastwards, i.e. towards the river. Overall, the slope is concave in profile. The shale outcrop occupies the longest downslope segment of the slope in the western part of the area, and the profile is most concave there also. The landslide area also occupies the longest segment of the slope in the west, but does not reach the river until the centre and east (Bass, 1954).

Hunter (1869, writing in 1819) described the landslide as 'The Canyers, a range of conical hills stretching about a mile', while Hepworth (1954) remarks, 'Canyard Hills were formerly called 'Kenhere' or Kenyer Hills'. These variations of name (now fixed by the Ordnance Survey as 'Canyards) probably result from the remote location, but the landslip certainly does not consist of 'conical' hills.

Description

The site is chiefly remarkable for the very large number of irregular ridges running along the slope approximately parallel to the cliff-face (Figure 5.21). They enclose numerous poorly drained and often marshy elongate troughs.

Transects downslope may cross as many as eight ridge-and-trough pairs, with amplitudes of 4–5 m, but generally decreasing in amplitude with distance downslope (Figure 5.22). In the west the area has separate ridge-like masses with breadths of up to 90 m, rising in some cases to over 15 m. They are rotational and appear to be aligned along curves which become shallower closer to the scar. They are covered with grass and bracken, and have steep sides. A few in the west are still partly attached to the scar. To the east of Canyards Brook the width of the area decreases and the landslides have more bench-like features. A few are ridge-shaped, but most have wide and steep downslope sides and little or no backslope (Bass, 1954).

Interpretation

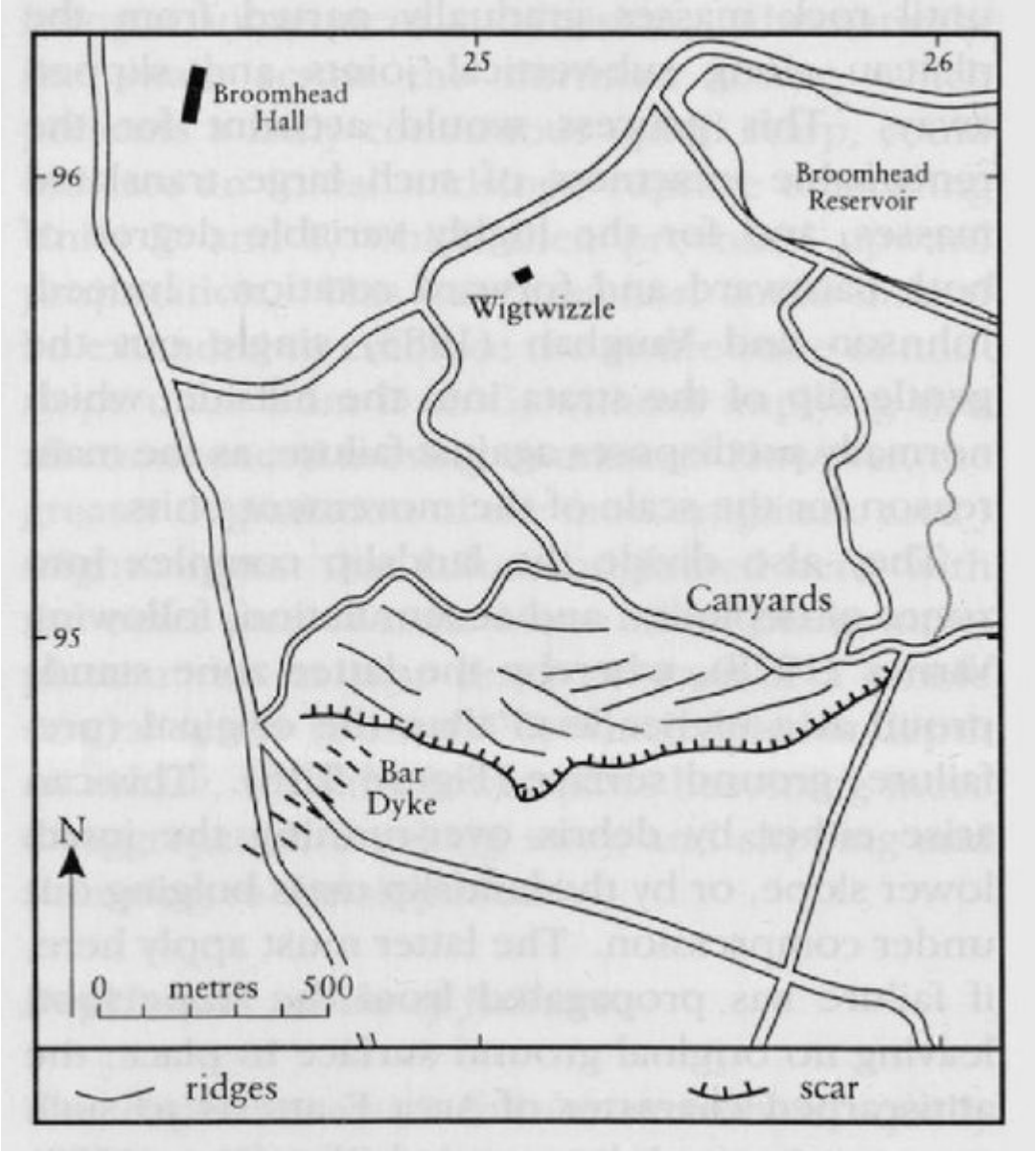
The features are thought to result from major break-up of the sliding mass during a single movement, as there is little to suggest that a succession of upper slides has taken place causing gradual cliff recession. The ridged physiography is probably due to break-up along the lines of fairly closely spaced pre-existing joints in the Huddersfield White Rock. This physiography is similar to that developed in shales, Shale Grit, siltstones and sandy shales of the Namurian at Bretton Clough, 18 km to the south (Boggett, 1989). Wood (1949) records that construction of the Broomhead Reservoir at the foot of the slope was begun in 1913 but not brought into service until 1936, in part because remedial works were

necessary to stabilize 'hillside ground movements'. Therefore it would seem that all or part of the Canyards slope movements have been subject to artificial stabilization.

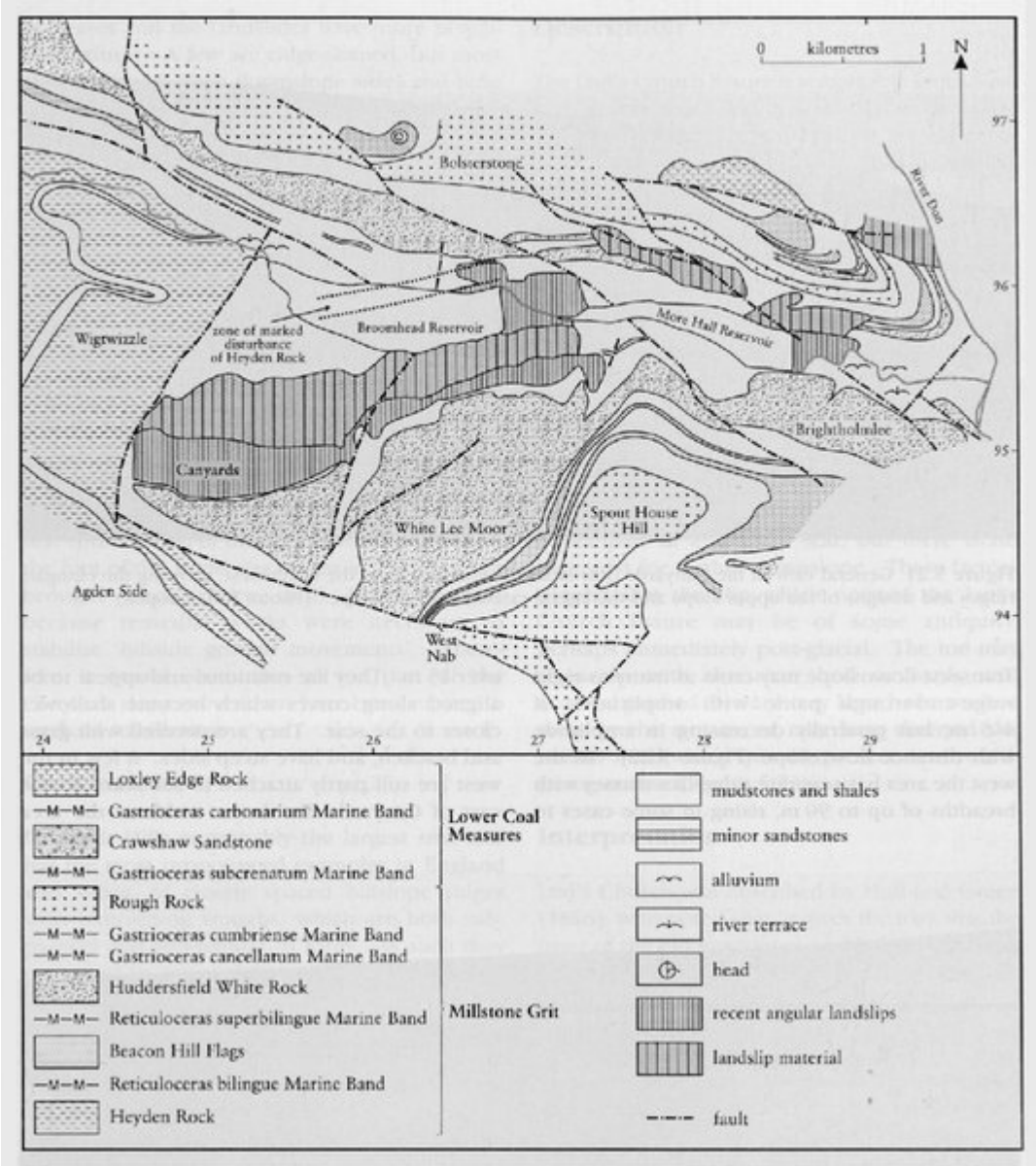
Conclusions

Canyards Hills is probably the largest site, and has the most pronounced examples in England and Wales, of closely spaced hillslope ridges with intervening troughs, which are both sub-parallel and sub-regular in form. As such they represent an unusual form of lateral extension failure caused by retrogressive unloading along a weak Namurian shale layer. The associated ridge–trough form is due to the coherence of the Huddersfield White Rock and the joint spacing.

References



(Figure 5.19) Location of Canyards Hills, showing linear features below the rockface and the upper slope.



(Figure 5.20) Geological map of the setting of the Canyard Hills landslide complex south of the Broomhead Reservoir.

(Figure 5.21) General view of the Canyards Hills landslide complex from the south-west, showing the elongate ridges and troughs of the upper slope and the lateral extension of the slope. (Photo: R.G. Cooper.)

(Figure 5.22) Canyards Hills landslide complex viewed from ENE — the uppermost failure blocks and arcuate scar. (Photo: R.G. Cooper.)