

DORSET LOCAL GEOLOGICAL SITES SURVEY

Site number GSZ08/14

Site name Giant's Grave Bottom (Giants' Trencher) near Ulwell, Swanage

Summary description.

Geomorphology

The easternmost of the twin valley systems which were initiated by streams during the Pliocene, but are dependent on the twin faults which occurred more than 20 million years, tilting the Chalk into an upright position, and later causing faults at right angles to the first set. The valleys are now dry.

Site description

Geomorphology

Giant's Grave Bottom is a steep-sided dry valley, which is part of a larger valley system that makes its exit from the Purbeck Chalk ridge towards the village of Ulwell. South-east of Ulwell the main valley is occupied by a small stream that eventually drains into Swanage Bay. This main valley is fault-guided for virtually all of its length.

The feature is incised in the Chalk ridge to a depth of approximately 100m and is about 500 m long. It is remarkable for the distinct change in direction after 300 metres from a bearing of 150 to one of 050. It is generally flat bottomed, about 30 metres wide, although there is a considerable narrowing towards the very steep headwall of the valley under Godlingston Hill. Although the sides are generally uniformly steep, there is some evidence of a steepening of the lower parts of the valley sides in the downstream section, particularly on the north.

The change in direction of the feature just over halfway along its course is of particular interest. It is possible that this is the result of structural control of the valley's development. Initially the valley could have been eroded back along a line of weakness, possibly a major joint, or a shear zone in the much fractured Chalk. At the point where the valley direction changes, headward erosion could have encountered another more pronounced structural feature, and further erosion followed this different trend. The other possibility, which is less likely, is suggested by the gap between Round Down and Godlingston Hill. The stream in the upper part of the valley could have made its original exit through this gap, only to be captured at a later stage by a rapidly eroding tributary of the main Ulwell stream eroding back along a line of weakness. It would seem that the lower part of the valley is not steeply enough incised for this to be the case, and there is no evidence of an original higher valley floor in the upper part of the valley.

In common with many similar steep-sided valleys in the Chalk, Giant's Grave Bottom may have been cut initially in pre-glacial times, but its overdeepened nature may be attributed to erosion by spring and early summer meltwater in periglacial times. During the periglacial winter, snowfields may well have accumulated on the crest of the Purbeck ridge and in the spring meltwater from these snowfields could have flowed down the existing valley, deepening its profile.

