
Porthloo, St Mary's

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Highlights

Fine exposures of head at this easily accessible site have been chosen as the stratotype for this material on Scilly since the early twentieth century. The stratigraphical relations of this material to underlying raised beach sediments are also clearly demonstrated.

Introduction

Barrow (1906) defined the section of granitic head at Porthloo (Figure 8.1) as the type-site for the 'Main Head' on Scilly. He commented that occasional exposures of raised beach could be observed at the base of the section. Mitchell and Orme (1967), while confirming the quality of the head outcrops at the site, commented that the raised beach exposures here were inferior to those at other sites, and did not correlate the raised beach here with either their 'Chad Girt' or 'Porth Seal' raised beaches. Scourse (1991), following Barrow (1906), took Porthloo as the type-site for the Porthloo Breccia (Figure 8.3), and correlated the raised beach with the Watermill Sands and Gravel.

Description

Two sedimentary units are exposed at Porthloo [SV 908 115]. Up to 5 m of coarse granitic head overlies occasional large rounded granite cobbles at the base of the section. The clasts within the head are all extremely angular, vary in size from pebbles to boulders, and are exclusively of granite. Barrow (1906) noted that the deposit locally varies in texture. The unit is mostly clast-supported and the matrix is extremely poorly sorted. In places it is stratified and occasionally displays lobate structures with clast concentrations along the margins of the lobes. The clast fabric is consistently oriented parallel with the local slope, but with a predominant dip into the flow direction.

Interpretation

The head at this site has been consistently interpreted as a solifluction deposit, and the underlying rounded cobbles as the remnants of a raised beach. In explaining the variation in texture of the deposit, Barrow (1906) commented that this ... is clearly due to the fact that the steep rock-face behind the Head alternately recedes from and approaches the present low cliff-face; in the former case, the Head is finer, in the latter coarser' (Barrow, 1906; p. 19). In terms of the model put forward by Scourse (1987) to illustrate the stratigraphic and sequential development of such deposits, this variation is between facies B (coarse blockfield/felsenmeer facies) and facies D (finer solifluction facies).

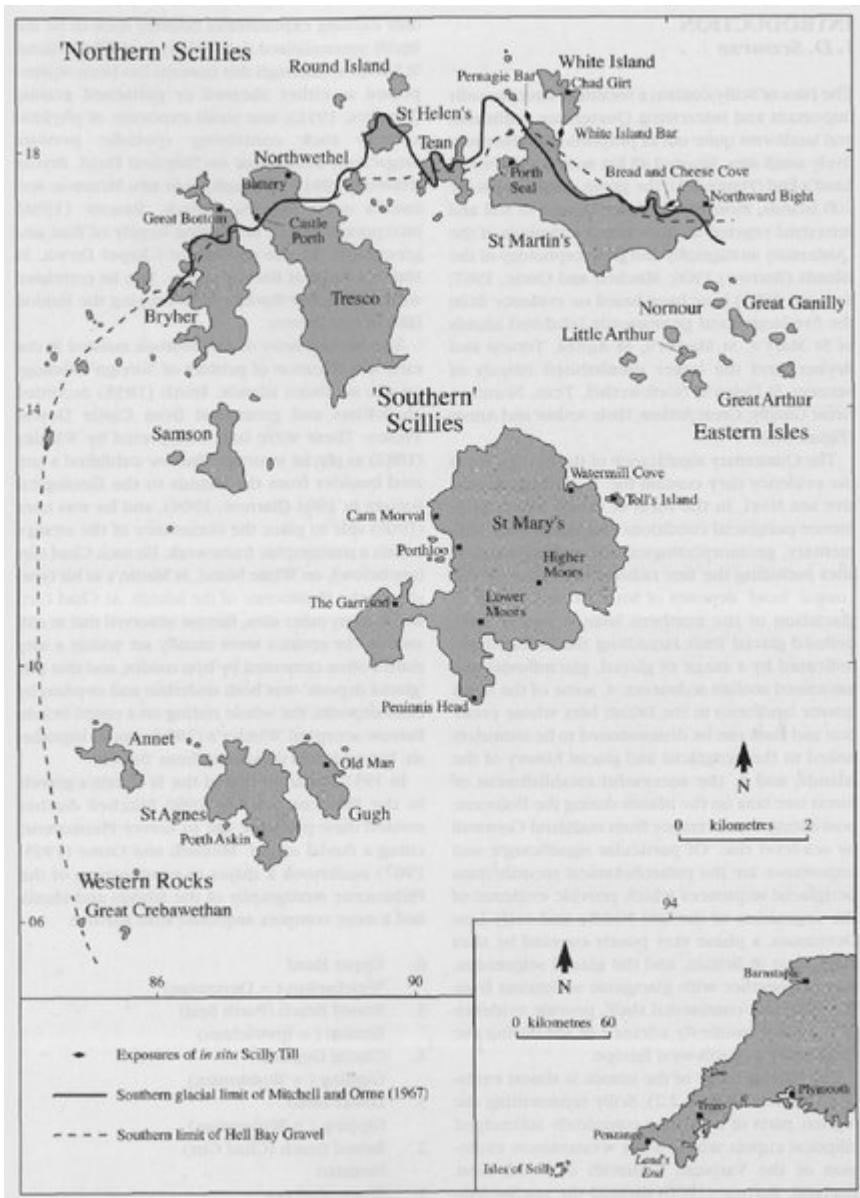
Barrow further noted that there had been little lateral transport of these deposits parallel to the shoreline as shown by the disposition of fragments of the Porthloo elvan or quartz-porphry; these do not extend more than a few feet on either side of the dyke. He contrasted this with the occurrence of transported raised beach cobbles within the deposit testifying to considerable forward and downward movement. This downslope movement has been confirmed through clast fabric studies in deposits of the Penwith Breccia at other sites (Scourse 1987, 1991). The characteristic dip of clasts into the section at angles between 5° and 45° from the horizontal have been explained by Scourse (1987) in terms of penecontemporaneous upfreezing accompanied by mass movement of material under gravity processes in the seasonally thawed layer characteristic of periglacial environments (French, 1976).

The source material for the head was overwhelmingly weathered local granite, though in places local lenses of silt occur within it which are probably of loessic origin, aeolian deposits derived from a wider source area.

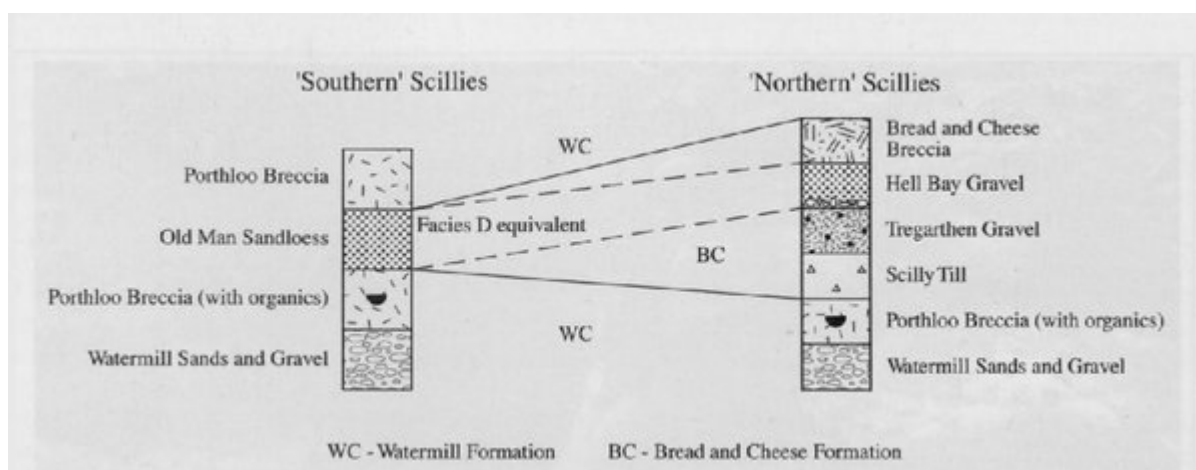
Conclusion

This site affords excellent and accessible exposures of sediments deposited downslope as a result of the seasonal thawing of ground in cold Arctic-type environments. These sediments are quite widespread on the Isles of Scilly, but the exposures at Porthloo have long been regarded as the best available.

References



(Figure 8.1) The Isles of Scilly: critical sites, exposures of the Scilly Till, the southern limit of the Hell Bay Gravel and Mitchell and Orme's (1967) glacial limit. (Adapted from Scourse, 1991.)



(Figure 8.3) A lithostratigraphic model for the Isles of Scilly. (Adapted from Scourse, 1991.)