
Hunts Bay

Highlights

A locality which shows outstanding sections of head, colluvium and reworked till deposited during the Devensian when this part of Gower was not glaciated. Devensian rocks overlie raised beach deposits and platform which may indicate at least three episodes of earlier Pleistocene temperate climate.

Introduction

Hunts Bay [SS 565 867] shows a Pleistocene sequence of marine deposits and terrestrial periglacial sediments, proving that south Gower was not glaciated during the Late Devensian. The site has a long history of research, commencing with the work of Strahan (1907a). It has been studied by George (1932, 1933a, 1933b), Bowen (1970a, 1971a, 1973a, 1973b, 1974, 1977a, 1977b) and Harris (1973). The site was also mentioned by Mitchell (1972), Peake *et al.* (1973), Stephens and Shakesby (1982), Davies (1983), Shakesby and Campbell (1985) and Bridges (1985). Henry (1984a, 1984b) provided descriptions of the exposures, and the raised beaches were dated by amino acid geochronology (Bowen *et al.* 1985; Bowen and Sykes 1988).

Description

The sequence of colluvial and periglacial sediments overlying raised beach deposits can be traced along much of the south Gower coast, but it is extensive and well exposed at Hunts Bay (Deep Slade), where the following generalised sequence (not necessarily in stratigraphic order at any one exposure) occurs overlying a Carboniferous Limestone shore platform. (Stratigraphic terminology of Henry (1984a, 1984b) in parenthesis) -

- 7 Colluvium and blown sand (Port-Eynon Silt)
- 6 Limestone head with erratics (Hunts West Breccia and Erratics)
- 5 Redeposited glacial sediments (Western Slade Diamicton)
- 4 Fine angular limestone head (Hunts Breccia)
- 3 Coarse blocky limestone head with red silt matrix (Hunts East Breccia)
- 2 Colluvial silts (Pwll Du Red Beds)
- 1 Raised beach deposits (Hunts Bay Beach)

The sequence is laterally variable (Figure 3) and a number of important exposures has been described (named by Bowen (1971a)). These are, a) Hunts Bay East Cove [SS 566 866]; b) Hunts Bay East [SS 565 867]; c) Hunts Bay Centre [SS 564 868]; and d) Hunts Bay West [SS 562 868].

Interpretation

The Pleistocene sections at Hunts Bay were first described by Strahan (1907a), who noted a sequence of glacial deposits containing Old Red Sandstone, grey sandstones and quartz conglomerates, resting on raised beach deposits which were largely devoid of 'travelled' rock types. The absence of such rocks indicated a 'pre-glacial' or possibly 'interglacial' age for the raised beach (Strahan 1907a).

George (1932, 1933a, 1933b) recorded a sequence of:

4 Head with pockets of glacial sediment

3 Fox red sand and loam

2 *Patella* raised beach

1 *Patella* beach platform

He considered that the raised beach had been deposited before the 'Older Drift' glaciation of the area because it contained very few erratics, and he regarded the overlying head as a typical solifluction deposit. The fox red sand and loam was believed to be fluvio-glacial in origin, and pockets of glacial sediments, originally deposited by ice of 'Older Drift' age, had later been incorporated into the head deposits (George 1933a). George showed that the majority of rocks in the glacial gravel had been derived from the South Wales Coalfield to the north, but others of a more distant origin were also present. These included Triassic conglomerate, soda-felsite from Llan and other rocks from North Wales and northern Pembrokeshire. The mixture of foreign and local rock types indicated to him the possible confluence between the Irish Sea and Welsh ice masses during the 'Older Drift' glaciation.

The nature and origin of the sequence at Hunts Bay, which makes up a large solifluction terrace, was discussed by Bowen (1970a, 1971a, 1973a, 1973b, 1974, 1977a, 1977b). From the evidence at Hunts Bay and elsewhere in Gower, he reconstructed the following sequence of events. The raised beach (bed 1) was of probable Ipswichian age, and represented a period of high sea-level conditions. With the onset of colder conditions during the Devensian Stage, colluvial silts (bed 2) and blocky limestone head (bed 3) were deposited. The colluvial silts were the product of sheet washing and soil erosion, and much of the material in beds 2 and 3 had been subjected to chemical weathering during the previous temperate (Ipswichian) event (Bowen 1970a, 1971a). This view was supported by Clayden (1977a), who described a possible pre-Devensian weathered profile *in situ* on the plateau above Hunts Bay [SS 563 873]. Unlike the blocky head (bed 3) which was attributed to frost-action on chemically prepared regolith, the finer calibre head (bed 4) was attributed to frost-action on fresh unweathered bedrock, during the later Devensian (Bowen 1971a). Contemporaneously, 'Older Drift' glacial deposits mantling the plateau above Hunts Bay were reworked and redeposited (bed 5) by alluvial and solifluction processes along the valley of Deep Slade (cf. Eastern Slade, Western Slade), and head (bed 6), also continued to form at Hunts Bay. Finally, during the Devensian late-glacial, the colluvium and blown sand (bed 7) were deposited.

Mitchell (1972), however, argued that the Hunts Bay raised beach was erratic-free and was probably Hoxnian (not Ipswichian) in age, and that the overlying lower blocky head and upper fine calibre head (Bowen 1971a) represented the Saalian and Devensian Stages, respectively.

In marked contrast to Mitchell (1972), Bowen therefore regarded sediments overlying the raised beach at Hunts Bay as the result of a single depositional cycle during the Devensian. He also noted that the erratic content of the raised beach was highly variable, thus making the basis of Mitchell's interpretation of its age even more untenable. Moreover, interpretation of the sequence as the result of a single depositional cycle did not necessitate loss of the Ipswichian Stage in a notional unconformity within the sequence (Bowen 1970a).

A detailed study of clast fabrics in the head deposits by Harris (1973) tended to confirm the origin of the sediments as solifluction deposits, with head having moved down the valley and from the sides.

From amino acid analysis of fossil marine molluscs Davies (1983) ascribed the raised beach deposits at Hunts Bay West (Site d) to Oxygen Isotope Substage 5e of the deep-sea record, the Ipswichian Stage (c. 125,000 BP), as proposed earlier by Bowen (1977b). Raised beach deposits at Hunts Bay East (Site b) also date from this time, although they contain some older shells, probably reworked from deposits of Oxygen Isotope Stage 7 age (c. 210,000 BP) (Davies 1983). Amino acid data with greater precision and less variability, show that a fauna of Oxygen Isotope Stage 9 also occurs in this beach (Bowen *et al.* 1985; Bowen and Sykes 1988).

Henry (1984a, 1984b) provided a detailed description of the deposits at Hunts Bay, and gave them formal stratigraphic names (see site description). She showed that the raised beach at Hunts Bay contained a fossil assemblage of marine

molluscs characteristic of the middle shore zone of rocky coasts. Foraminiferal and ostracod assemblages indicate temperate, shallow water marine conditions, and Henry concluded that the beach had been deposited during a temperate interglacial episode with sea-level similar to or a few metres higher than at present; amino acid ratios confirmed this as an Ipswichian event (Oxygen Isotope Sub-stage 5e) (Davies 1983; Bowen *et al.* 1985; Bowen and Sykes 1988).

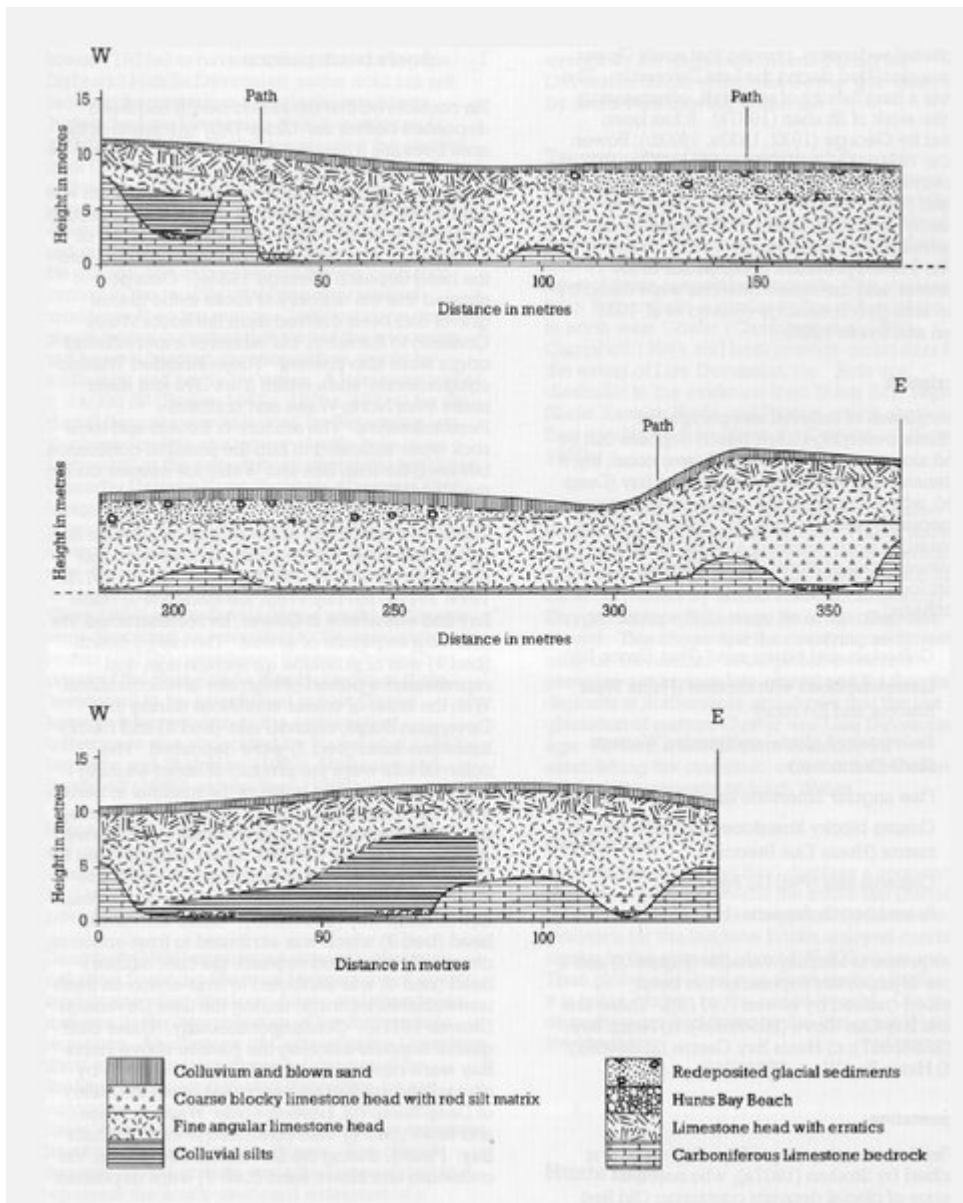
Amino acid geochronology has established that raised beach sediments at the site are Ipswichian in age (Bowen *et al.* 1985; Bowen and Sykes 1988). Deposits overlying these Sub-stage 5e marine beds demonstrate a deterioration of conditions during the Devensian Stage, when sheet-washing and soil erosion was followed by the accumulation of frost-shattered bedrock; at the same time, glacial deposits from an earlier pre-Devensian glaciation were recycled and redeposited by alluvial and solifluction processes. This exceptionally detailed sequence of head deposits is significant in illustrating in a single section some of the range of periglacial sediments and processes associated with the Devensian Stage (Bowen 1971a). Hunts Bay has been proposed as a reference site for limestone head deposits in Gower (Henry 1984a), and together with several other sites, is notable in demonstrating that parts of south Gower were not glaciated during the Late Devensian ice maximum.

Hunts Bay is a classic site for Quaternary research. It shows a sequence of raised marine deposits overlain by colluvial, head and redeposited glacial sediments. The raised beach sediments have been ascribed by amino acid geochronology to Oxygen Isotope Sub-stage 5e of the deep-sea record, although elements of an older reworked fauna are also present in the deposits. Together with the raised marine shore platform, the site therefore provides evidence for three high sea-level stands, at least, during the Pleistocene. Detailed sedimentary evidence has shown that the overlying terrestrial sequence is the product of a single Devensian depositional cycle during both cold and periglacial conditions. This evidence suggests the south Gower coast was not overrun by Late Devensian ice, unlike Rotherlade (Langland Bay) in the east and Broughton in the north-west.

Conclusions

Hunts Bay contains a sequence of deposits representing the last glacial cycle. When the global sea-level was high, about 125,000 years ago, the Hunts Bay raised beach was formed, and represents the last time Britain enjoyed conditions similar to the present. The last ice age is represented at Hunts Bay by cold climate (periglacial) deposits. These show that this site was not covered by an ice-sheet during the last ice age. As such, the evidence is important in establishing the maximum dimensions of the last ice-sheet in Wales.

[References](#)



(Figure 3) Quaternary sequence at Hunts Bay (after Bowen and Henry 1984)