Poppit Sands

Highlights

Poppit affords evidence of high sea-levels probably during the last, Ipswichian Stage, interglacial, followed by periglacial then glacial conditions. During the latter, Irish Sea ice deposited till in northern Preseli.

Introduction

Poppit Sands (Poppit) [SN 146 489] shows a sequence of deposits which provides evidence for marine, periglacial and glacial episodes in southwest Wales during the Late Pleistocene. The site is particularly important for a well developed shore platform overlain by raised beach sediments. The site was first noted by Jones (1965) and has been described by John (1968a, 1970a, 1971a), Bowen (1971b, 1973a, 1973b, 1974, 1977a, 1977b) and by Peake *et al.* (1973). The most detailed description and interpretation is provided by John (1970a, 1971a), Bowen (1977a, 1977b) and Bowen and Lear (1982).

Description

A raised shore platform overlain by raised beach sediments was first recorded at Poppit by Jones (1965). The succession was more fully described by John (1970a) as:

4 Irish Sea till (2.0m)

3 Blocky head (6.0m)

2 Raised beach sediments (1.7m)

1 Rock platform

The shore platform lies between 1.7 and 3m above high water mark; and can be traced along the coast between Cei-bach and Trwyn Careg-ddu for 1 km (John 1970a). The raised platform consists of a planed surface on tightly folded Lower Palaeozoic shale and sandstone beds, quite unlike the present shore platform which is being differentially eroded (Bowen 1977a, 1977b; Bowen and Lear 1982). The overlying raised beach deposits are characterised by a great deal of lateral variation in the size of pebbles and the nature of the matrix. In places, the beach deposits consist largely of shingle and small pebbles cemented with iron oxide and manganese oxide. Elsewhere it is made up entirely of boulders over 0.7m in diameter. It contains no shells (Bowen and Lear 1982). At the eastern end of the sections, the raised beach sediments are associated with up to 2m of stratified sand and silt (John 1970a; 1971a). Elsewhere, they are overlain directly by a blocky head, up to 6m thick, derived from the high local backslope which reaches 183m OD. The head is succeeded by up to 2.0m of Irish Sea till, although this is largely concealed by vegetation on the degraded surface of the drift terrace (Bowen 1977a). John (1970a) described the blocky head at Poppit as the lower head, the upper head being absent, although it occurred on the other side of the Teifi at Gwbert (Jones 1965; John 1970a). (The latter section no longer survives.)

Interpretation

From evidence at Poppit and elsewhere in the local area, John (1968a, 1970a, 1971a) proposed the following sequence of events. The rock platform was fashioned during an interglacial period when sea-level approached 15m (50 ft) OD. The raised beach sediments were believed to have been deposited during the Ipswichian Stage, when sea-level may have reached as high as 9m (30 ft) OD. John (1970a, 1971a) considered that the site fully deserved the status of type locality for the raised beaches of west Wales, and he accordingly named the period of their formation the Poppit Interglacial. The overlying head indicated a period of periglacial conditions in the succeeding Devensian Stage. He concluded that the

head could be subdivided into various facies; these reflecting a prolonged period of periglacial climate that was characterised by a number of distinct climatic fluctuations. The periglacial phase at Poppit was followed by deposition of till by ice moving southward from the Irish Sea Basin in the Late Devensian (locally named Dewisland) glaciation. The Irish Sea till at Poppit has not been studied in detail. John (1970a), however, believed that an equivalent till bed occurred at Gwbert on the opposite side of the Teifi Estuary. From the Gwbert till, MacDonald (1961) and Jones (1965) had recorded a wide range of erratics including granite from Ireland, Eskdale granite from the Lake District and a series of rock types from Wn and Meirionedd, confirming that it was ice from the Irish Sea Basin which had invaded the area around Gwbert and Poppit.

Such an interpretation was broadly followed by Bowen (1971b, 1973a, 1973b, 1974, 1977a, 1977b), who also regarded the Poppit raised beach sediments as being Ipswichian in age, with the overlying periglacial and glacial sediments attributable to the Devensian Stage.

Although the sequence at Poppit has not been dated, Bowen and Lear (1982) described a laminated clay, some 0.5m thick, interbedded with angular boulders and rounded cobbles from the raised beach near Trwyn Careg-ddu [SN 148 489]. This clay contained a foraminiferal assemblage including *Elphidium crispum,* a species not present in the modern fauna of the bay. Since *E. crispum* had been shown to occur in sand and gravel sandwiched between till beds in the central part of Cardigan Bay, Bowen and Lear suggested that it was therefore of some use in correlating the upper till of Cardigan Bay, of believed Late Devensian age, with the till at Poppit.

Although Poppit is of interest primarily for its well developed shore platform and overlying raised beach deposits, the remainder of the succession also provides important information on changing environmental conditions in south-west Wales during the Late Pleistocene. The sequence shows that a period of high relative sea-level, probably during the Ipswichian Stage, was followed by a prolonged phase of periglacial climate when thick head deposits were formed. This was followed by fully glacial conditions when ice moved into northern Preseli from the Irish Sea Basin. Although Irish Sea till deposits are better exposed at Traeth-y-Mwnt and Abermawr, Poppit is a key reference site for raised beach deposits and, unlike the former sites, demonstrates the interaction of marine and terrestrial conditions in south-west Wales.

The shore platform and raised beach sediments at Poppit are amongst the finest features of their kind in Wales. The sections are particularly important in integrating both marine and terrestrial evidence in a single exposure. The sequence shows that high sea-levels, probably during the Ipswichian Stage, were followed by periglacial conditions when head accumulated. The succeeding till clearly demonstrates the onset of fully glacial conditions and provides important evidence for the movement of the Irish Sea ice-sheet into northern Preseli.

Conclusions

The raised shore platform and pre-last ice age (interglacial) raised beach deposits at Poppit are text-book examples of their kind. The raised beach was probably formed about 125,000 years ago. The sequence exposed here also shows the history of the last ice age.

References