

Evidence for Late Pleistocene environmental changes at Towan Beach, south Cornwall

H.C.L. JAMES

Faculty of Environmental Studies, Bulmershe College of Higher Education, Woodlands Avenue, Earley, Reading R G6 1HY



Introduction

Details of Late Pleistocene environmental changes may be gathered from an examination of sites at Towan Beach (GR 871330) near the southern extremity of the Roseland Peninsula in south Cornwall. A low-level raised shore platform is present at the northern and southern ends of the beach. This platform, cut across the Portscatho Series, descends to below H.W.M. in the centre of Towan Beach.

The raised beach at Towan Beach is distinctive with well-rounded quartz pebbles and oval-shaped locally derived slate/shale cobbles in a sandy matrix. These ancient marine deposits which rest upon the raised platform, are commonly stained or cemented by iron and/or manganese oxides and may be more than one metre thick. The small quartz pebbles occur in horizontal seams in the lower section of the raised beach. There is a sharp hiatus between the iron-cemented raised beach and the base of the overlying head which is marked by a pale grey clay band at the southern end of the beach. At the northern end of the beach, the raised beach thickens to 1.6m but at the seaward extremity of the underlying platform the ancient marine deposits have become eroded and incorporated into the contemporary beach.

The raised beach is overlain by locally derived head deposits which are consistent in texture and stratigraphy throughout the section at Towan Beach. The lower blocky head consists of clasts of local rock with mean lengths of 10-15cm in a sandy clay matrix overlain by a fine sandy clay with occasional small fragments of shale and quartz. Conspicuous throughout this locality is a band of well-comminuted shale and slate attaining a maximum thickness of one metre and forming the upper section of the head deposit. A number of involutions are clearly preserved in the upper section of this shale/slate band both at Towan Beach and farther north at Pendower where a similar stratigraphical layer may be observed.

Near the northern end of Towan Beach, wedge features may also be seen in the uppermost part of the comminuted shale/slate of the head deposit. The shale fragments forming the sides of the wedges are vertically inclined and continue into adjoining involutions. The largest of these wedges, which are unique on the south coast of west Cornwall, has a maximum width of 7cm and extends for more than 50cm through the broken shale/

slate section into the underlying sandy clay. Loessic deposits in turn overlie the disturbed layer and form the infill of the wedges. Finally a silty organic earth may be found at the top of the section.

Discussion

The raised platform and its associated beach obviously pre-date the overlying head which, represented by a number of differing facies traceable for many kilometres along Gerrans Bay, is interpreted as a single chronostratigraphic unit representing one cold (glacial) period. These facies changes probably represent changes in local environmental conditions which are further exemplified by the evidence for frost disturbance preserved in the form of involutions and wedges in the uppermost part of the finely broken shale/slate head horizon. Similar forms in identical stratigraphical positions have been recorded in north Cornwall by Stephens (1970) at Godrevy, and by Clarke (1965) at the Camel estuary.

The presence of small fragments of local rock as well as small amounts of clay in the overlying loessic horizon suggests it to be of a slope wash origin rather than an aeolian deposit *in situ*. Recent thermoluminescence tests upon samples of loessic material from south Cornwall and the Scilly Isles found in similar stratigraphical positions to those at Towan Beach have produced Late Devensian dates (Wintle 1981). Thus it would appear that the head deposits represent the Devensian glacial period and probably reflect a number of changing environmental conditions since the emplacement of the raised beach.

Acknowledgements. I would like to thank J. Catt and J. Rose for helpful discussions.

References

- Clarke, B.B. 1965. The superficial deposits of the Camel estuary and suggested stages in its Pleistocene history. *Trans. Roy. Geol. Soc. Cornwall*, 19, 257-279.
- Stephens, N. 1970. The West Country and Southern Ireland. In: *The Glaciations of Wales and Adjoining Regions* (Ed. Lewis C.A.) Longmans, 267-314.
- Wintle, A.G. 1981. Thermoluminescence dating of late Devensian loesses in southern England. *Nature, London*, 289, 479-480.