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Post-glacial site at Ponsandane, near Penzance

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The first detailed description of a submerged forest in Mount's Bay appeared in Boase's paper in 1825 followed by a number of briefer reports this century by de Beer (1960, 1966) and most recently in Goode and Taylor (1988). This paper describes a temporary exposure in Holocene material at Ponsandane, near Chyandour on the eastern approach to Penzance. In 1988/89 construction of the Penzance bypass necessitated the excavation of Ponsandane Field in order to install supports for the fly-over leading into the Treneere Valley (NGR SW479311) (Fig. 1, site A). These extensive excavations revealed gravels and sands overlying 3-4m of peat extending over an area of at least 2400m^2. As the peat was being removed to expose more solid foundations and in turn replaced with hardcore over a very short period of time, a large monolith was cut from one of the temporary faces of the peat together with other smaller samples of macro-plant material.

Close examination of the borehole logs indicates that the depth of the peat beds at Ponsandane Field ranged from 2.3m above Ordnance Datum (OD) to approximately 1.8m below OD. Confirmation of the landward extent of the peat beds eastwards from Penzance is derived from other boreholes sunk by contractors involved in the building of a number of by-passes and industrial estates in the area around Mount's Bay since 1980 (Fig. 1, sites B-D). This borehole evidence, together with earlier records extending back into the last century, shows that virtually all of the lowland area between Marazion and Wherry Town (NGR SW467295), which is backed by a former cliff-line (Fig. 1), to have been covered with peat beds at some point during the Holocene period. The thickness of these beds varies from a few metres, for example at Ponsandane and the former Huel Darlington Mine near Marazion, to a few centimetres elsewhere.

Apart from the Mount's Bay area, significant occurrences of peat beds in other parts of West Cornwall have been recorded between Hayle and St Erth (NGR SW550362), and at Praa Sands (NGR SW575282). The recent construction of the Hayle by-pass once again revealed the extend of the peat beds in the lower Hayle valley, while Sims and Stephens (1980) and French (1983) recently described the Praa Sands exposure.

Obviously the seaward extent of the peat beds/submerged forests is much more difficult to plot. There have been numerous reports of sightings of such material usually at low spring tides following winter storms. However, evidence for the extent of the submerged forests beyond the present low water mark is much more sparse, for apart from the occasional trees dredged up by local fishermen, only a few exploratory boreholes for alluvial tin have been sunk into the offshore zone within Mount's Bay. Goode and Taylor (1988) report one such occurrence whereby peat from a depth of approximately 32m below OD, from a borehole 4km offshore from Penzance, has been radiocarbon dated at 12,070±80 BP. Although this date places this sample within the Late Glacial (Devensian) period, nevertheless, some evidence for the existing seaward extent of the former land surface is thus provided.

The cross-sectional geological diagram for the Ponsandane site (Fig. 2), largely based upon exploratory borehole evidence and observation of available temporary sections shows a strongly weathered bedrock surface of slate with vein quartz, which was probably a former shore platform, overlain by a suite of silty sands and gravels. This basal unit varies from approximately 1 to 4m in thickness and consists largely of sand and gravel with varying amounts of silt and

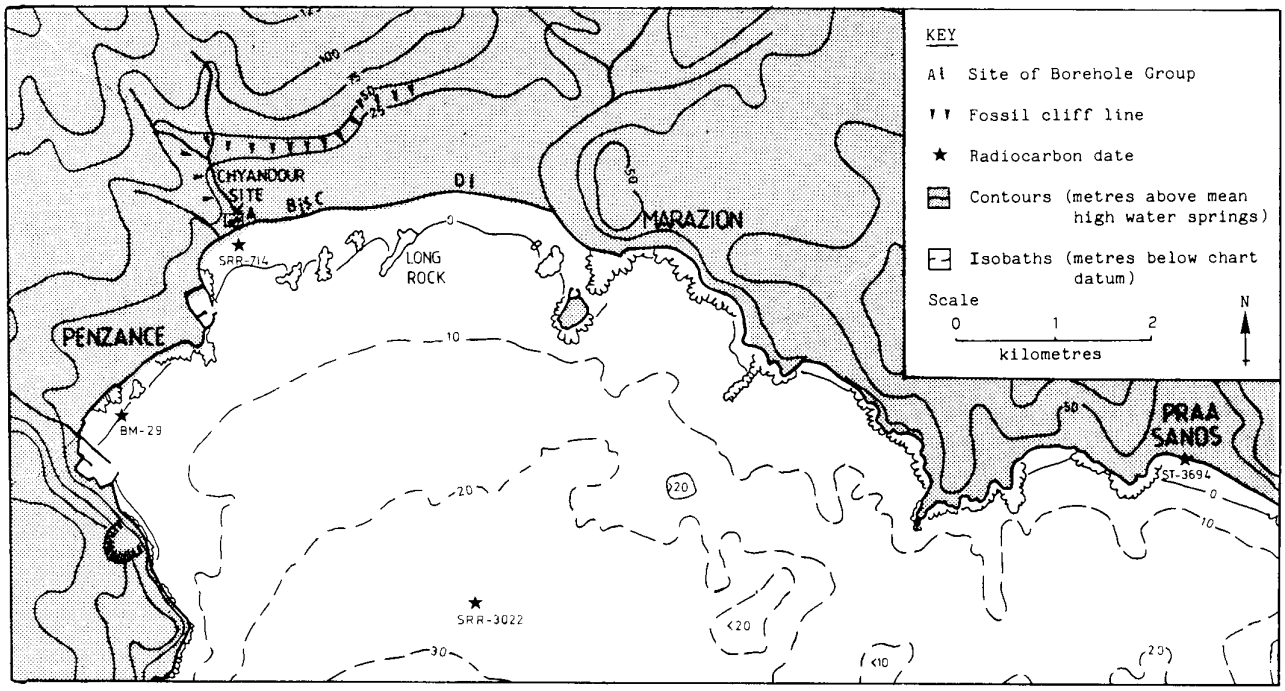

Figure 1. Quaternary coastline and extent of peat beds, Mount's Bay.

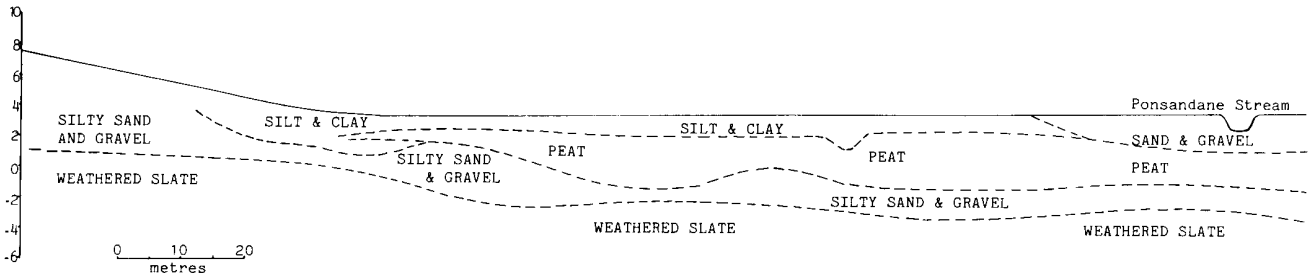

Figure 2. Ponsandane Field: geological interpretation.

Table 1. Radiocarbon dates near Penzance.

Date	Author	Lab. No.	Locality	NGR
12,070±80 BP	Goode and Taylor (1987)	SRR-3022	Mount's Bay	SW506273
4278±50 BP	Heyworth and Kidson (1982)	SRR- 714	Gulval	SW48373092
3656±150 BP	Kidson and Tooley (1977)	BM-29	Larrigan	-
1805±100 BP	Kidson and Tooley (1977)	ST-3694	Praa Sands	SW578280

cobbles, and with occasional boulders. This unit is alluvium associated with the Ponsandane/Trevaylor stream, comparable with the basal unit described by Taylor and Beer (1981) following a similar exposure during the construction of the Marazion by-pass 4km to the east.

The peat unit is largely overlain by silty clays, sands and gravels, the latter being most significant near the channel of the Ponsandane stream, and again are interpreted as fluvial deposits. There was no palaeontological evidence of marine sedimentation in either the basal or top units. Unfortunately, the top unit was so disturbed by construction work that it was impossible to determine depositional characteristics.

Seaward of Ponsandane Field is the Eastern Green, formerly a sand dune structure extending from the now completely built-over Western Green near Wherry Town, which continues eastwards towards Long Rock (NGR SW500313) and beyond towards Crowlas (NGR SW515332) and Marazion. Sand dunes overlying the peat beds are a common feature in the coastal peat sections and occasionally such structures must have obstructed the gradual landward movement of the transgressive Flandrian sea, thereby permitting the development of shallow lagoonal structures before being finally overwhelmed by the rising sea. It is possible that the silty clays that apparently overlay the peat unit at Ponsandane Field may have represented such an event.

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