

FIELD EXCURSION TO STUDY MEADFOOT GROUP SEDIMENTATION, MAGMATISM AND TECTONICS, 4TH JANUARY 1995

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INTRODUCTION

The purpose of this field excursion was to briefly examine the style of Lower Devonian sedimentation and magmatism, plus subsequent Variscan deformation, within the Meadfoot Group. An enthusiastic party of eighteen people departed in overcast and windy conditions, from Fowey Hall. A choppy and somewhat thought-provoking ferry crossing to Bodinnick was followed by a pleasant drive through classic Du Maurier country on the east side of the River Fowey. For the first two localities, cars were parked above Lantic Bay at the National Trust car park [SX 149 514].

PENCARROW HEAD [Sx 152 506]

The party walked to the summit of Pencarrow Head where panoramic views allowed the geology of area to be briefly summarized. To the east, in Lantivet Bay, bedding was observed to generally dip moderately northwards. A conformable boundary between the Dartmouth Group and the structurally underlying Meadfoot Group was placed to the northeast of the Watch House [SX 156 508] by Ussher *et al.* (1909) and requires that the Lower Devonian succession is overturned. To the west, the party viewed the continuation of the Meadfoot Group exposures through Gribbin Head into St. Austell Bay, and the approximate boundary with the Gramscatho Basin succession north of Mevagissey. In the distance, the Dodman and Lizard peninsulas were noted as key elements of Variscan thrust tectonic models.

The party spent some time examining the low-lying Meadfoot Group exposures around the summit and moved progressively southwards to more extensive outcrops on the south-west flank of Pencarrow Head. The area comprised thin- to medium-interbedded fine-grained sandstones and mudstones. Way-up criteria included cross-lamination and occasional ripples, but were not conclusive at this locality. A strongly developed cleavage (S1) locally transposed the thinly bedded units in the hinge region of folds and was refracted in the more competent sandstones.

GREAT LANTIC BEACH [SX 148 509]

The party traversed around the west side of Pencarrow Head and descended, via a steep footpath, onto Great Lantic Beach. A northerly-dipping heterolithic sandstone-mudstone and sandstone-dominated succession was exposed on the east side of the beach. Cross-lamination, and ripple cross-lamination indicated that the succession was overturned. Bedding-cleavage relationships were consistent with the way-up indicators. Evidence for late- or post-Variscan deformation included north-south trending steeply dipping faults with quartz-pyrite infills and kink bands. In deteriorating weather conditions, the party examined the excellent exposures on the west side of the beach. The succession was dominated by thin- to medium-bedded sandstones and mudstones displaying fine examples of cross-lamination, ripples and load casts. In addition, rare thinly-bedded bioclastic limestones were observed, which contained an assemblage of corals, brachiopods, crinoids and

possible fish fragments (the latter identified by Dr. Kevin Page of English Nature). Way-up criteria and the vergence of parasitic folds was compatible with the succession forming part of the overturned limb of a large-scale southwards facing fold as described by Lane (1966, 1970).

Following a heavy downpour, the party retreated to the car park and retraced the outward journey, via the Bodinnick Ferry to Fowey. We then drove on to The Ship Inn at Polmear where we received excellent hospitality and food. The weather improved and we drove westwards, with renewed high spirits, to the car park adjacent to the ECC china clay dries at Par [SX 074 529].

SPIT POINT [Sx 075 524]-FISHING POINT [Sx 067 523]

The party took the public footpath from the car park to Spit Point and spent a while examining the Meadfoot Group exposures to the west. In contrast to the previous localities the succession was mudstone-dominated and displayed evidence of presumed contemporaneous Lower Devonian magmatism. Thin- to medium-bedded tuff horizons were interbedded with the mudstones, and were generally bedding-parallel. However, these locally appeared to be intrusive and promoted considerable discussion within the group. These were locally cut by dolerite sheets up to 3 m in thickness. Due to a rising tide, the party walked along the cliff path to Fishing Point, where swaley cross-bedding was observed in medium-bedded sandstones and the location, below current beach level, of volcanoclastic debris flows containing basalt clasts was described.

The party returned to the car park and briefly discussed the day's geology. Meadfoot Group sedimentation was interpreted in terms of a shallow mixed siliciclastic and carbonate shelf environment developed during Lower Devonian rifting. Magmatic activity associated with rifting was basic in character and formed high level intrusions and locally extrusive rocks. Variscan deformation was strongly influenced by the geometry of earlier basement structures developed, or active, during the earlier rift episode. The anomalous zone of southwards-facing folds between the Porthnadder and Castle Dore-Coombe Hawne faults may represent primary backthrusting (eg Steele, 1994) or post-D1 refolding (Lane, 1970; Hobson, 1976).

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