
Flagstaff Quarry RIGS site

NRW RIGS no. 387 [SH 63561 80745]

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RIGS Statement of Interest:

Comparison of the Flagstaff Quarry RIGS with the Tandinas Quarry RIGS (JRD 10) reveals important lateral facies changes within the early Asbian sequence of the Penmon peninsula of Anglesey. Viewed as a whole, the Dinantian succession in North Wales records the establishment and growth of a carbonate platform during a protracted, but pulsed marine transgression. As part of this event, the early Asbian limestones of the Penmon area records the initial inundation of the older Ordovician and Precambrian rocks which form the basement to the Anglesey Dinantian sequence at a time when there were marked differences in facies between the sheltered platform interior and its exposed outer margin. The Flagstaff Quarry RIGS statement emphasises features not fully assessed in the GCR description provided by Adams and Cossey (2004). Exposed in the upper part of Flagstaff Quarry is the Tollhouse Mudstone Bed. This important late Asbian marker bed lies within the cyclical Loggerheads Limestone Formation (see RIGS JRD 10 for lithostratigraphical usage and sources) and permits precise correlation with the Tandinas Quarry section and Great Ormes Head (Warren et al., 1984). Such correlations reveal marked lateral facies changes within the underlying early Asbian sequences present at these localities. Distinctive, white-weathering, porcellaneous limestones are a feature throughout the 47 m-thick Leete Limestone Formation sequences exposed at Tandinas, and dominate the Flagstaff Member near the top of the formation (see RIGS JRD 10). The latter has its type section at Flagstaff Quarry, but is the only portion of the section in which porcellaneous limestones are abundant. Here, this 8.5 m-thick unit is both underlain and overlain by thick sequences of variably dolomitised, cross-bedded, oolitic and skeletal grainstone, rich in abraded algal plates and with rolled brachiopods and corals. Thick, disarticulated valves of the chonetid brachiopod *Daviesiella llangollensis* present in the upper of these units confirm the early Asbian age of strata 12.5 m below the base of the Tollhouse Mudstone. These facies resemble the dolomitised grainstones which make up the Llandudno Pier Dolomite seen on the Great Orme, and which is now viewed as part of the regional Llanarmon Limestone Formation (Davies et al., 2004; Waters et al., in press). Contrary to Power (1977) and Davies (1983) therefore, it is appropriate to include the Flagstaff Quarry grainstones also in this division, and to exclude all but the Flagstaff Member from the Leete Limestone Formation. At Tandinas Quarry, the latter formation was interpreted as a series of progradation peritidal rhythms. In contrast, the sedimentary structures, grain types and textures of the Llanarmon Limestone of the Great Orme are consistent with deposition in off-shore barrier and shoal settings (Davies et al., 2004). The Flagstaff Quarry RIGS provides clear evidence of an interleaving of high energy barrier and low energy back-barrier facies consistent with its intervening location.

Geological setting/context: The Dinantian succession of North Wales records the evolution and growth of a carbonate platform founded on the older Palaeozoic and Precambrian rocks of the region in response to pulsed, but sustained marine transgression (George, 1958, 1974; Somerville & Strank, 1989; Davies et al., 2004). The Dinantian sequence on Anglesey was deposited during the latter phases of this event, during the Asbian and Brigantian stages. Late Asbian and younger parts of the succession are cyclic in character; constructed from a series of shoaling up-wards limestone sequences each capped by a palaeokarstic surface. In contrast early Asbian strata on Anglesey and elsewhere in North Wales record a period of slow, but sustained sea level rise which promoted peritidal deposition across the platform interior in the lee of platform margin shoal/barrier facies. The Flagstaff RIGS provides crucial evidence of the local interleaving and time equivalence of these contrasting facies.

Network context of the site: The site forms one of series of 9 selected to illustrate the Anglesey Dinantian succession and the processes, erosional, depositional and diagenetic, which were active during and subsequent to its accumulation; these in turn from part of a broader network of Upper Palaeozoic RIGS in North Wales.

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