Beaumaris Cliff & Drumlin

NRW RIGS no. Site 135 [SH 60926 76476]

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RIGS Statement of Interest:

Beaumaris Cliff and Drumlin RIGS provides one of the best and most accessible examples of a drumlin and the finest exposure through tills of mixed Irish Sea and Welsh provenance on Anglesey's Menai Strait coast. The crest of the drumlin reaches 24m OD and its pronounced long axis runs about 500m north-south. A 300m-long coastal section runs parallel to its long axis, reaching about 20m height in the centre, but thinning out completely at both ends. Most of the section exposes pink-grey till or boulder clay, which grades upwards into a 1–2m-thick capping of red-brown till. The two layers contain a similar mixture of erratics, mainly igneous clasts and slate from the mainland and more locally derived limestone and sandstone. Farther-travelled rock types from the Irish Sea Basin also occur, including various granites. The main pink-grey till is largely unbedded and matrix-supported and contains numerous well-dispersed clasts of various sizes, including a few massive boulders of local Carboniferous limestone. Marine shell fragments are common and many of the stones are striated. It is likely that the tills were deposited in a single Late Devensian event and that the two till layers simply reflect different debris streams within the ice profile. The admixture of rock types could be used to suggest they were deposited from a confluent Welsh and Irish Sea ice stream. Alternatively, the Irish Sea ice sheet may have incorporated and redeposited sediments from an earlier Welsh ice advance.

Geological setting/context: About 2.4 million years ago there was a general cooling of the Earth's climate, heralding the onset of the Quaternary "Ice Age", a period of geological time extending to the present day. In reality, the period has seen a number of cold 'glacial' periods interspersed with warmer 'interglacial' periods such as the one in which we now live. Since about 450,000 years ago there have been at least four intensely cold periods during which large parts of upland Britain were covered by ice sheets for long periods. Although Anglesey was probably overrun by ice on these occasions, only evidence from the last major glacial phase — the Late Devensian — is known. Possible evidence from the warm interglacial period before the Late Devensian may locally have escaped the destructive erosional and depositional effects of the last glaciation. During the Late Devensian, around 20,000 years ago, Anglesey was completely submerged by ice. Two ice sheets from different sources were involved. The Snowdonian mountains were the source of ice streams that moved broadly northwards towards Anglesey, while a massive Irish Sea ice sheet, fed by glaciers from Scotland, Ireland and Cumbria, moved onto the island from the north. The Irish Sea ice stream was dominant, and travelled north-east to south-west across the island, broadly in keeping with its NE–SW-trending, structurally controlled rock ridges. The Welsh and Irish Sea ice streams met in the region of the present-day Menai Strait and produced a confluent south-westward flow. Deposits from the Irish Sea ice tend to contain a wide range of rock types from its diverse source areas and from the varied geology of the seafloor traversed. A red colouration is common, being derived partly from Permian-Triassic rocks offshore. The Irish Sea sediments commonly contain unconsolidated seafloor debris, including sand and shell fragments, dredged from the seafloor by the ice. Tertiary lignite, coal fragments and flint are also a characteristic component of the Irish Sea deposits. Alternatively, deposits from the Welsh ice sheet reflect the geology of its source areas, with a high proportion of Cambrian slates and mudstones, varied Ordovician igneous materials and a blue-grey colouration. Although the broad pattern of the island's glaciation has been understood for nearly 100 years, the exact timing of the arrival and retreat of the different ice masses is poorly understood, as is the relative extent of both ice masses during the Late Devensian. Anglesey contains an exceptional range of Quaternary evidence, in the form of coastal sediment exposures, glacial landforms and erratic boulders, which can be used to reconstruct the glacial history of the island, and elucidate regional variations in ice movement and sedimentary processes. Three separate networks of RIGS have been selected to demonstrate the glacial history of the island. These are: 1) sedimentary sequences; 2) erratic boulders and; 3) glacial/glaciofluvial landforms. Selected sites may belong to more than one of these networks.

Network context of the site Beaumaris Cliff and Drumlin belongs primarily to Network 1 ('Sedimentary sequences') although it also provides an excellent example of a drumlin. Significant areas of Anglesey are covered by Quaternary

deposits, and the island's coastline provides an unusually high degree of exposure. Key sections have been selected as RIGS to demonstrate the most important lithological and sedimentological characteristics of the island's glacial and glaciofluvial deposits. The sites therefore provide important evidence for understanding the origins and movements of the ice masses that affected the island during the Late Devensian.

References:

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