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## Llanerchymedd RIGS Site

NRW RIGS no. 278 [SH 41463 81958]

[GeoMôn Global Geopark original webpage](#)

### RIGS Statement of Interest:

This site comprises three large erratic boulders of hornblende–picrite, lying in separate fields to the south of Llanerchymedd. They are some of the most important erratics on Anglesey, because they originate from a restricted suite of small outcrops and consist of an exceptionally durable and distinctive rock type. They therefore allow local ice-flow directions to be reconstructed with some precision. Erratic 1 [SH 414 827] and Erratic 2 [SH 415 824] lie to the east of the disused Amlwch to Llangefni railway line, while Erratic 3 [SH 415 818] lies to its west near Pont y Crochan, where it is incorporated in an old field boundary. Erratic 2 is believed to be that described and figured by Edward Greenly (1919). He noted that erratics of hornblende-picrite were "...by far the largest and most striking in the Island of those that have travelled any distance", and he charted an erratics train of these boulders from their most north-easterly outcrop at Mynydd Eilian, south-westwards to the west coast. Erratic 2 is the largest of the group of three, measuring approximately 4 x 3 x 2 metres. Erratics 1 and 3 are somewhat smaller. All three have a mixture of rounded/subrounded surfaces juxtaposed with flatter faces. A working hypothesis is that the rounded surfaces represent the weathered and glacially abraded surfaces of the picrite as it occurred in outcrop prior to glacial entrainment and transport, while the flatter surfaces are joint surfaces relatively little altered by glacial abrasion. It seems likely, therefore, that the boulders have not been transported very far. The farthest possible on-land sources are small picrite outcrops at Mynydd Eilian, some 11km to the north-east. The erratics could also have been transported south-westward from one of the small outcrops around Llandyfrydog, about 5km away. The nearest sources, however, are the picrites cropping out near Hafod-y-m■n and Cae Mawr, off the Rhosybol road, some 2.5km away. If the latter sites were the erratics' source, an almost due south ice movement is indicated across this area.

**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:** Llanerchymedd is one a series of Anglesey RIGS belonging to Network 2, 'Erratic boulders'. Erratics are glacially transported stones and boulders. They may form a component of glacial deposits such as till, or can occur as stranded boulders on the land surface. Their distance of transport varies enormously from a few metres to many hundreds of miles. Erratics composed of distinctive rock types (different to the underlying bedrock geology) can be traced back to their point of origin and can serve as important indicators of glacial flow direction. Anglesey is famous for a series of erratics first described systematically by Edward Greenly (1919) in his seminal work, *The Geology of Anglesey*. Some of the stranded boulders described by Greenly appear to have very distant origins, perhaps in Scotland or the lake District. Others are of distinctive local rock types that clearly indicate ice-flow directions across the island. Some have not been moved far at all, but are still testament to the immense transporting and erosional power of the Late Pleistocene glaciers. In many cases, the erratics have been used in one form or another by man. These megaliths have considerable archaeological value and some are protected as Scheduled Ancient Monuments (SAM). Others are the subject of myth and folklore and the exact geological and archaeological context of many is still poorly understood. The Llanerchymedd erratics are composed of picrite, an unusual type of peridotite. It is an ultrabasic rock of plutonic origin, rich in the green mineral olivine and has an alkaline affinity.

## References:

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GREENLY, E. (1919). The geology of Anglesey. *Memoirs of the Geological Survey of Great Britain*. HMSO, London, 980pp. (2 vols).

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**Site geometry:** Site boundary