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# Traeth-y-Mwnt

## Highlights

This locality shows Irish Sea till and sand and gravels assigned to the Devensian, last, glaciation. The section is affected by enigmatic glaciotectonic folds.

## Introduction

Traeth-y-Mwnt [SN 194 519] is an important exposure through glacial sediments which show large-scale glaciotectonic deformation structures. The sections provide important evidence for the incursion of Irish Sea ice into Cerecligion. The site featured in an early study by Williams (1927) and was described and discussed recently by Davies (1988).

## Description

The sections at Traeth-y-Mwnt occupy the eastern part of the bay and extend laterally for about 100m. They reach about 15m in maximum height and comprise a sequence of:

3 Hillwash and blown sand

2 Shelly fluvioglacial sands and gravels

1 Shelly grey Irish Sea till

The principal glaciotectonic structure at Traeth-y-Mwnt is a large over-fold, about 15m across and 12m high. The feature is strongly accentuated by alternating bands of different textures and colours within the till sequence. Other parts of the till sequence also exhibit evidence of severe disturbance, in the form of near-vertical bedding. Further sedimentological interest is provided by fluvioglacial sands overlying the till, which show well developed fault structures. The sands are in turn overlain by cryoturbated gravels.

## Interpretation

Williams (1927) correlated the till at Traeth-y-Mwnt with the Lower Boulder Clay of his widely found tripartite sequence, for example, at Gwbert [SN 163 495]. He noted the occurrence in the till of frequent Carboniferous Limestone clasts, many of which contained large radiating masses of *Lithostrotion*. Shell fragments, including *Cyprina (Arctica) islandica* L. and *Astarte* sp., were also noted, suggesting that the till had been deposited by ice moving onshore from the Irish Sea Basin. He regarded the overlying sands and gravels as fluvioglacial in origin and correlated them with the Middle Sands and Gravels of his tripartite classification. They had been deposited at the margin of a retreating ice-sheet, but no explanation was offered to account for the deformation structures in the underlying till (Williams 1927). The Irish Sea till at Traeth-y-Mwnt was also noted by Bowen (1977b).

Recently, Davies (1988) described and reinterpreted the sequence, arguing that it comprised a basal lodgement till overlain by varved glacio-lacustrine sediments, flow tills and fluvioglacial sands and gravels. The succession was believed to have accumulated during stagnation and deglaciation of the Irish Sea ice-sheet. Davies accounted for the glaciotectonic structures by a combination of subglacial deformation processes and post-depositional mass movements.

The position of Traeth-y-Mwnt in a regional Pleistocene chronology is not well established. In view of lithostratigraphical evidence elsewhere along the coast, it is likely that the glacial sediments at Traeth-y-Mwnt were deposited by southward moving Irish Sea ice (John 1968b; Bowen 1977b). In view of amino acid geochronological studies at nearby Banc-y-Warren and Abermawr (Bowen 1984), the deposits at Traeth-y-Mwnt are probably Late Devensian in age. It is interesting to note the similarity of the faulting structures in the sands at Traeth-y-Mwnt to those described at

Banc-y-Warren (for example, Helm and Roberts 1975; Allen 1982; Worsley 1984), although they need not have formed in the same way(s).

The principal interest of the site lies in large deformation structures in the till. Although the scale of deformation is probably unparalleled elsewhere in Wales, no comprehensive and satisfactory explanation has yet been offered. The absence of an overlying till might imply that deformation was not caused by a readvance of ice, as has been proposed at, for example, Dinas Dinlle (Whittow and Ball 1970) — see Chapter 7. The till at Traeth-y-Mwnt occupies a deep and narrow coastal inlet which lies perpendicular to the inferred direction of ice movement. Although speculative, it is possible that deformation occurred as basal till was forced downwards into the tightly confined embayment.

Traeth-y-Mwnt provides an important section through Irish Sea glacial sediments which are probably the product of Late Devensian Irish Sea ice that moved generally south across the area. Traeth-y-Mwnt is, therefore, important for demonstrating the incursion of Irish Sea ice into Ceredigion and, with other reference sites, helps to show the complex interactions of Welsh and Irish Sea ice along the coast of west Wales. The site is also important for a series of spectacular large-scale glaciotectonic deformation structures. The precise environmental conditions for the sequence and structures, however, remain to be established.

## **Conclusions**

The exposures at Traeth-y-Mwnt display large-scale deformation structures in glacial deposits. Although these structures have been interpreted as having formed on land, another view is that they developed through the process of submarine slumping in a cold climate sea, adjacent to marine-based glaciers.

## **[References](#)**