Cors y Llyn

Highlights

This locality provides one of the most detailed records of Holocene vegetational and environmental change in Mid Wales, and the only such record in the eastern Cambrian Mountains. The Holocene sequence lies above what is probably a full Devensian late-glacial sequence.

Introduction

Cors y Llyn (Llyn Mire) provides the most detailed record of Holocene vegetation and environmental changes in Mid Wales. The basin contains Late Devensian lake sediments overlain by Holocene organic muds, with swamp and carr vegetation on the north and west side. The south-east part of the site continued as a lake until about two hundred years ago when it was colonised by a floating raft of vegetation. The vegetational and historical development of Llyn Mire have been studied by Moore and Beckett (1971) and Moore (1978).

Description

Llyn Mire occupies a depression in the upper Wye Valley [SO 016 552] at 170m OD, about 6 km northeast of Builth Wells. The bog measures approximately 600m by 200m, and the present vegetation consists of four main groups — a peripheral carr of *Betula pubescens;* a *Sphagnum–Calluna* area with stunted trees of *Pinus sylvestris* in the south-east; an arc surrounding the south-east area with *Molinia caerulea* (L.), *Vaccinium oxycoccus* L. and *Pleurozina schreberi* (Brid) Mitt.; and a northern area where extensive carpets of *Eriophorum angustifolium* Hoppe predominate and most of the species already mentioned are absent (Moore 1978).

A series of borings shows that the mire occupies three basins formed on an undulating surface of glacial sediments (Moore and Beckett 1971). The stratigraphy at the deepest point of the south-east basin (Moore 1978) showed a 10.5m thick sequence of:

10 *Sphagnum* peat

9 *Phragmites* and/or *Carex* peat

8 Water

7 Mud

6 Gravel

5 Silty mud

4 Clay

3 Silty mud

2 Clay

1 Till

The lower beds (1–4) were not analysed in detail by Moore (1978) but were believed to represent a Devensian late-glacial sequence. The upper part of the sequence, some 8m, was analysed in detail for both pollen and macrofossils by Moore (1978). No radiocarbon dates are available for the site.

Interpretation

Moore (1978) described six local pollen assemblage biozones representing Holocene vegetation development locally. The earliest assemblage (pollen zone LM-1) was dominated by *Betula, Juniperus* and Gramineae, and demonstrated the expansion of birch woodland into open-grassland with juniper scrub. Towards the end of this zone, many open-ground species were present, which show that woodland development was incomplete.

This pollen zone was succeeded by another (pollen zone LM-2) dominated by *Betula, Ulmus, Corylus* and *Myrica.* The changes in this pollen zone are best explained in terms of the invasion and displacement of the birch woodland, grassland and juniper scrub by elm, oak and hazel. Pine may also have invaded the area at this time. The layer of gravel within this pollen zone (bed 6) was not associated with any discernible change in the pollen assemblage. Moore (1978) suggested that the layer was, therefore, probably caused by local erosion followed by washing of sediment into the lake basin.

The major event of the following zone (pollen zone LM-3) is the development of *Quercus, Ulmus, Corylus* and *Myrica* woodland which increased at the expense of birch. Alder may also have been present in the latter part of this zone. The occurrence of juniper pollen suggests that some open areas may have survived locally, and the presence of ferns indicates the acidification of local soils (Moore 1978).

The succeeding pollen zone (pollen zone LM-4), dominated by *Quercus, Alnus, Ulmus, Betula, Corylus* and *Myrica,* records, in particular, the attainment of dominance by oak and alder. The upper part of this zone is marked by pronounced changes in the ratio of non-arboreal to arboreal pollen, and Moore (1978) has suggested that the presence of ribbed plantain *Plantago lanceolata* and fumitory *Fumaria* is particularly indicative of disturbance to the vegetation cover at this time, perhaps by human agencies. This short-lived event, however, precedes the very marked elm decline of the next zone.

The following *Quercus, Alnus, Corylus* and *Myrica* dominated zone (pollen zone LM-5) records evidence for vegetation disturbance in the form of a rapid decline in elm, pine and lime pollen. Moore considered that there was strong circumstantial evidence to relate these changes to forest clearance and the cultivation of cereals. The pollen record from the upland site at the Elan Valley Bog to the north-west, however, suggests that increased climatic wetness at this time may also have been an important factor (Moore and Chater 1969a).

The major changes of the last recorded Lyn Mire pollen zone (pollen zone LM-6), characterised by *Pinus, Quercus* and Gramineae pollen, are best explained in terms of continued woodland clearance and the development of agriculture. At this time, *Betula* carr probably survived around the edge of the basin, and peat harvesting may have led to the invasion of *Pinus sylvestris* (Moore 1978).

Llyn Mire provides the only detailed record of Holocene vegetational and environmental changes from the upper Wye Valley. The site therefore provides information on the Holocene development of vegetation in a major valley on the eastern side of Mynydd Elenydd (Cambrian Mountains). In contrast, most other studies of vegetational changes in Mid Wales have been concerned with the ridge of Mynydd Elenydd itself and the land to the west (for instance, the Elan Valley Bog, Borth Bog, Tregaron Bog, Cledlyn Valley). The record from Llyn Mire shows vegetational development from the early Holocene (*c.* 10,000 BP) when birch woodland began to develop on the otherwise open-ground, grassland and juniper dominated landscape. The course of this development can be traced through the displacement of this early assemblage by elm, oak and hazel woodland, and the eventual attainment of dominance by oak and alder. The elm decline is very marked and is accompanied by evidence of cultivation; the first such evidence of cereal growing in early Neolithic times in Mid Wales (Moore 1978).

The lithological evidence shows that following the wastage of Late Devensian ice, sedimentation occurred in three basins on the till surface at Llyn Mire. A succession of clay, silty mud and clay (beds 2–4) was deposited on the surface of the till and is thought to be Devensian late-glacial in age; the threefold succession is characteristic of sequences elsewhere in Wales where the Older Dryas, Allerød and Younger Dryas are represented. The succeeding silty mud (bed 5) occurs in all three basins and shows deposition in open-water conditions in the early Holocene. The invasion of reed swamp and

fen vegetation followed, and open-water conditions ceased in the northern and western basins. In the south-east basin the lake became enveloped by a floating mat of aquatic vegetation. This floating mat or *Schwingmoor* type of bog is rare in Britain, and Llyn Mire is an unusually fine example. The final vegetation invasion of the lake surface is believed to have occurred in historic times, during the post-Mediaeval period (Moore and Beckett 1971).

Llyn Mire contains an important Devensian late-glacial to Holocene sequence. Although the Devensian late-glacial sediments have not been studied in detail, the record of Holocene vegetational changes is one of the most detailed in Mid Wales, and the only such record on the eastern side of Mynydd Elenydd. The course of vegetation development can be traced from the early Holocene well into historic times. The pollen record shows clearly the 'elm decline' and provides the first evidence of cereal cultivation in early Neolithic times in Mid Wales. Part of the site was still a lake until two hundred years ago when it was colonised by floating vegetation.

Conclusions

Llyn Mire is the only site which provides a record of vegetational, environmental and climatic change on the eastern side of Mynydd Elenydd (Cambrian Mountains). It is important because it shows the first evidence of cereal cultivation in early Neolithic times in Mid Wales. Botanically, its floating vegetation *Schwingmoor* bog is one of the best examples in Britain.

References