
Devensian Late-Glacial and Holocene environmental history

J. D. Scourse

Introduction

This section introduces GCR sites located on the granite moorlands of Bodmin Moor (Hawks Tor and Dozmary Pool) and Dartmoor (Blacklane Brook and Black Ridge Brook). These four sites were selected because they demonstrate the most complete and detailed records of Devensian late-glacial and Holocene environmental history in these areas. They are effectively regional representatives in a national GCR site network designed to illustrate the most salient features of British Devensian late-glacial and Holocene environmental change.

With the exception of the Somerset Levels (Chapter 2), the environmental history of South-West England during the Devensian late-glacial and Holocene is perhaps less well understood than that of other areas in the British Isles. This partly reflects a lack of suitable depositional basins in which sediments from this time interval could accumulate. This is especially true of the granite moorlands, and is at least partly because large areas were never glaciated. In contrast, other areas of the British Isles north of the Devensian maximum glacial limit (Figure 2.3) are characterized by more profuse erosional (e.g. cirque) and depositional (e.g. kettle hole) basins in which both Devensian late-glacial and Holocene sedimentation occurred. Depositional basins yielding palaeoenvironmental data from this part of the Quaternary in South-West England, by contrast, consist generally of topogenous or soligenous mires, or are the sites where lakes developed in hollows on granitic bedrock. The most critical sites of this age in the region are, as a result, mostly confined to areas of granite bedrock on Bodmin Moor, Dartmoor and the Isles of Scilly. It should be noted that these areas are characterized by acidic soils, with Bodmin Moor and Dartmoor providing the highest relief of the region. The palaeoenvironmental records from sites in these areas should therefore be interpreted in the light of local edaphic and physical controls, and should not necessarily be regarded as being indicative of typical regional conditions.

Despite the uneven distribution and context of the most important localities, the GCR sites across South-West England together provide a comprehensive coverage of Devensian late-glacial and Holocene environmental history. These mire and lake sediments have yielded pollen and plant macrofossil data critical in vegetational reconstruction, and some have yielded diatom data which have enabled assessments of temporal changes in water chemistry. All the selected sites have been calibrated by the radiocarbon method. These data together enable a continuous record of climate, vegetational and environmental change to be reconstructed for the past 13 000 years.

No organic deposits are known in the region which date from between 21 000 to 13 000 BP, the full-glacial phase of the Late Devensian. The earliest record for the Devensian late-glacial is provided by Hawks Tor on Bodmin Moor (Conolly *et al.*, 1950; Brown, 1977, 1980) where the classic tripartite stratigraphy of the Devensian late-glacial was first identified in Britain. The study published by Conolly *et al.* (1950) was actually undertaken during the late 1930s and early 1940s prior to the identification of the Allerød event (Windermere Interstadial) at Windermere (Pennington, 1947) and at Flitwick (Mitchell, 1948): their study allowed correlation with better-established Devensian (Weichselian) late-glacial sequences in Ireland, Germany and southern Scandinavia, and made Hawks Tor a 'landmark' in the development of pollen biostratigraphy in Britain.

Although the Holocene record at Hawks Tor is incomplete, the Devensian late-glacial sequence there is undoubtedly the finest known in the region. Pollen and plant macrofossil evidence from the site indicates the presence of arctic-montane species prior to 13 000 BP (Older Dryas) at a time of active solifluction. The climatic amelioration of the Allerød (Windermere Interstadial) led to the development of birch woodland in sheltered valleys. The succeeding Younger Dryas (Loch Lomond Stadial) saw a reversion to active solifluction with arctic-montane species flourishing in an open, treeless environment. This record is important in demonstrating the relative paucity of the interstadial vegetation here in comparison with other sites in southern Britain at lower altitudes and on more base-rich soils, and in registering the severity of periglacial processes during the Younger Dryas: this implies a degree of continentality in marked contrast to the present oceanic climate.

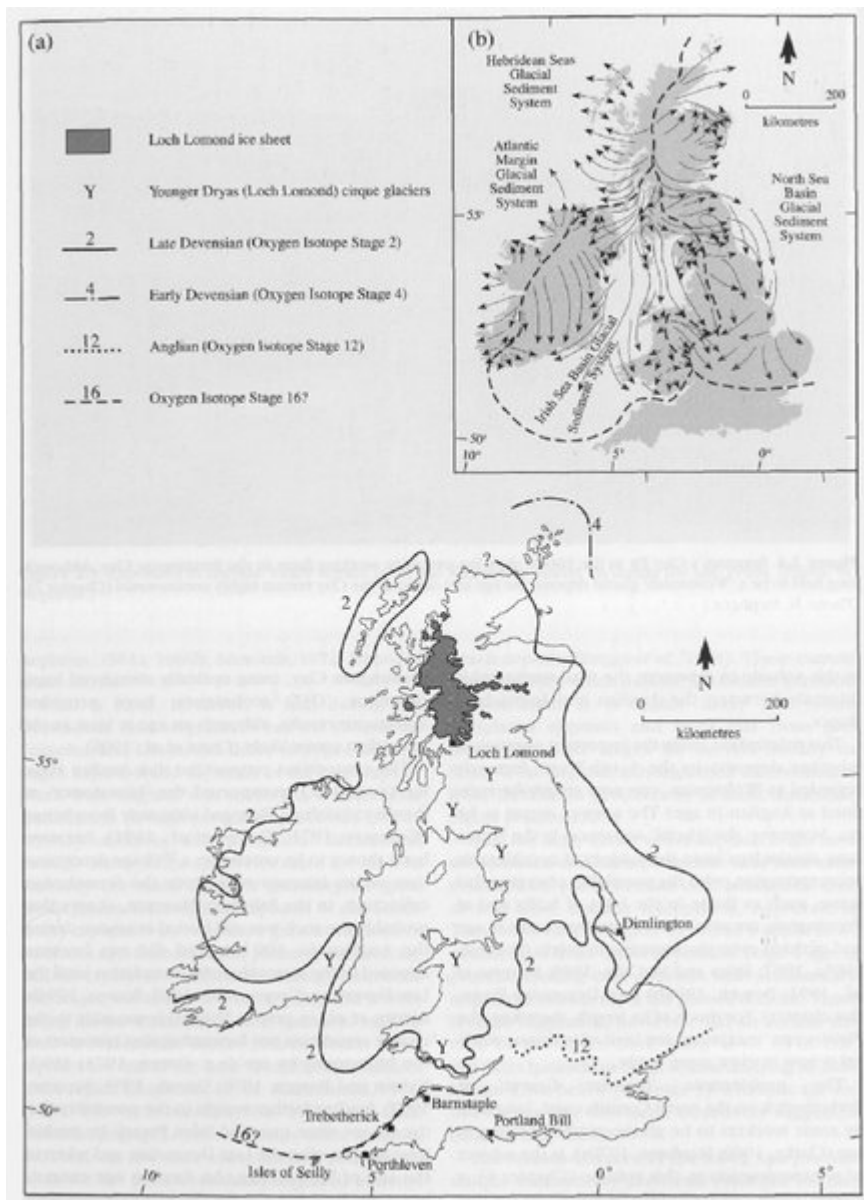
More complete Holocene records are preserved in sediments at nearby Dozmary Pool (Conolly *et al.*, 1950; Brown, 1977) and at Blacklane Brook (Simmons, 1964a; Simmons *et al.*, 1983; Maguire and Caseldine, 1985) on Dartmoor. Both sites occur on upland granite characterized by acidic soils, but Blacklane Brook (457 m OD) lies at a considerably higher elevation than Dozmary Pool (265 m OD). In common with many other sites across southern England, these two localities demonstrate the major features of vegetational and environmental change characteristic of the Holocene: early Holocene open-grassland vegetation, gradual immigration of thermophilous arboreal species, a mid-Holocene forest stage, and then gradual clearance of woodland as a result of anthropogenic activity. There are, however, some important vegetational differences between the two sites. There is some evidence to suggest that Blacklane Brook lay close to the regional treeline during the phase of maximum forest cover during the mid-Holocene while the lower-lying environs of Dozmary Pool were dominated by open oak forest. This is in marked contrast to other areas of Britain which apparently demonstrate a much higher treeline at this time, and also contrasts with other sites in southern England which were dominated by other tree species (Bennett, 1989). The dominance of oak in the Holocene forest of South-West England is thought to be related to the dominantly acidic character of the soils. However, as indicated above, this may not hold true for the entire region and may simply reflect the acidic substrate of these particular sites. Whatever their spatial extent, these differences illustrate the significance of climatic and edaphic factors in determining the pattern of Holocene vegetational development.

Both Dozmary Pool and Blacklane Brook are extremely important in providing evidence of woodland clearance by fire as early as the Mesolithic. At Blacklane Brook, the evidence is based on changes in pollen assemblages at around 7500 BP, and at Dozmary Pool such changes are complemented by charcoal within the peat profile at around 7000 BP, and by a profusion of archaeological material close to the site. Both sites continue to be important in discussions regarding the relative significance of climatic and anthropogenic factors in disrupting woodland from the mid-Holocene onwards.

At around 6500 BP, many sites in the region indicate a change to a wetter climate. This is indicated by the development of raised and blanket bogs, and the rapid spread of alder at sites on Bodmin Moor and Dartmoor. It is perhaps significant that this coincides with the onset of peat accumulation at Higher Moors (St Mary's) on the Isles of Scilly (Chapter 8). Peat from the base of this mire has been dated to 6000 BP (Scaife, 1984), the oldest Holocene organic sediments yet reported from the islands. This site is important because its pollen evidence indicates that indigenous woodland was able to regenerate on the Isles of Scilly during the mid-Holocene: this has implications for studies of tree migration and dispersal given that the islands lie 45 km from the mainland against the direction of the prevailing south-westerly winds.

The Higher Moors site on Scilly, and the Bodmin Moor and Dartmoor sites, all demonstrate the progressive clearance of woodland by humans during the Neolithic and later. The Mesolithic clearance episodes were relatively minor and limited to the mainland, and most sites show evidence of post-clearance forest regeneration. The mainland Neolithic clearances, however, were more long-lasting, and pollen evidence, including pollen grains of cereals, weeds and ruderals, indicates active cultivation from this time onwards. On Scilly, regeneration occurred after an initial phase of Neolithic clearance, woodland only being irreversibly removed from the middle Bronze Age onwards.

[References](#)



(Figure 2.3) (a) Reconstructed Pleistocene maximum ice limits after Bowen (1994a) and Gray and Coxon (1991). (b) British glacial sediment systems. After Charlesworth (1957), and Bowen (1991). (But also see (Figure 8.4).)