Botton Head

[NZ 596 020]

Introduction

Botton Head is located near Ingelby Greenhow, in the North Yorkshire Moors National Park and is about 4 km from Broughton Bank. This locality in the Aalenian Saltwick Formation is a comparatively recent find. Preliminary investigations have revealed a reasonably large flora with many good gymnosperm reproductive organs. The site has great potential for future studies on gymnosperm evolution and taxonomy.

There is no published account of the palaeobotany of this site, and the following assessment of its significance is based on manuscript notes by Dr Christopher Hill, deposited with fossil plants from the site, in the Natural History Museum, London. Other manuscripts held by the Museum deal with the palynoflora (J.E. John) and megaspores (A. Leitch).

Description

Stratigraphy

The beds, like those at Broughton Bank and Roseberry Topping, belong to the Saltwick Formation. They are composed of claystones, siltstones, sandy siltstones and sandstones overlying the black shales of the Dogger succession (Figure 3.35). The sediments were deposited after the first erosion phase of channel activity in the area and, therefore, yield an interestingly different assemblage from those of the other two sites. There are no marked channel deposits and for some of the time conditions favoured coal formation.

The plant beds are about 2 m thick and extend more than 1 km laterally. The principal bed is above the main sandstone, and is overlain by a micaceous and carbonaceous siltstone with rootlets, followed by a thin layer of dark grey claystone. Like the beds at Broughton Bank and Roseberry Topping, they are near the base of the Hayburn Formation but, unlike the beds at the other two sites, they indicate deposition in an overbank swamp environment with no marked channel association.

Palaeobotany

The complete list of species recovered from this site is given in (Table 3.1). The principal plant bed contains a relatively low abundance of pioneer plants, such as *Pachypteris papillosa* and ferns, a relatively greater number of bennettites, and some conifers such as *Marskea* and *Bilsdalea.* These assemblages are more characteristic of a mature, fairly stable sedimentary environment.

There is considerable lateral variation in the composition of the flora. In some places the grey and grey-brown shales are about 0.15 m thick and incorporate in the top 0.1 m an *Equisetum columnare* rhizome bed about 200 mm thick.

The coaly layer is rich in bennettites, such as *Nilssoniopteris, Pterophyllum, Zamites* and *Otozamites,* together with pieces of *Equisetum columnare* and *Ptilophyllum hirsutum.*

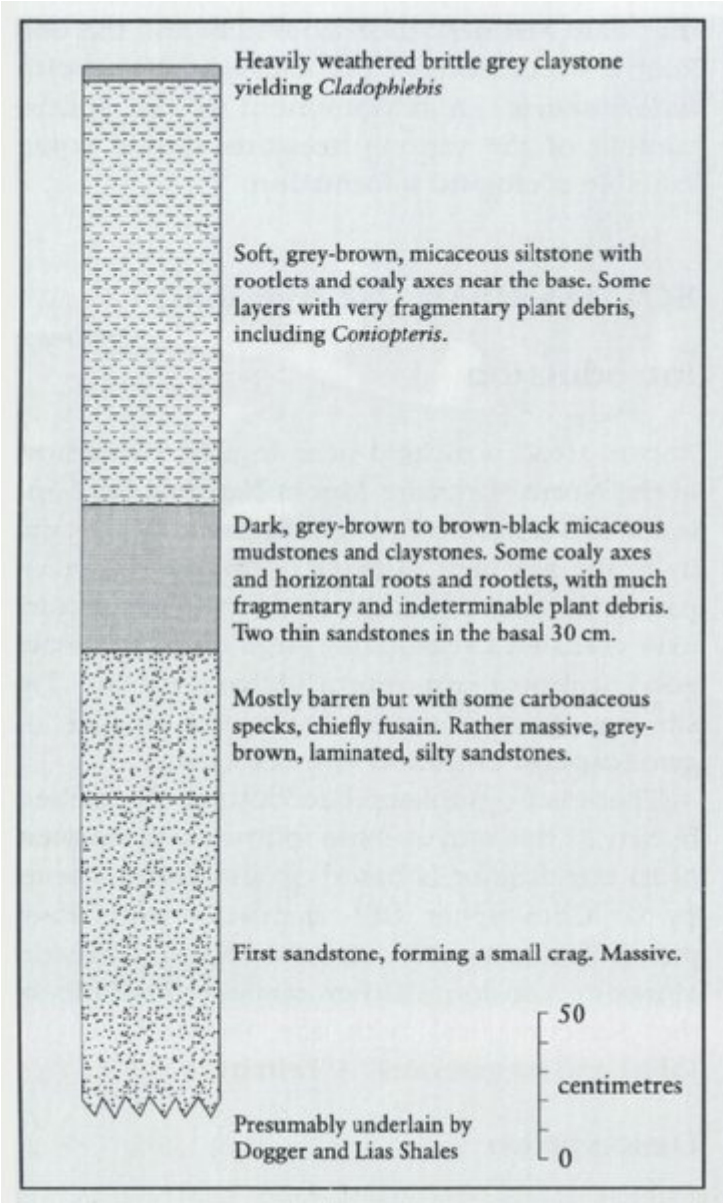
Interpretation

A flora such as this, which is rich in bennettites and conifers, is characteristic of a more mature lop set' phase of fluvio-deltaic activity than is found at Broughton Bank and Roseberry Topping. The composition of the coaly layer suggests that it formed by the accumulation of pieces of plants from the surrounding vegetation. The fragmentary pieces of *Equisetum columnare* must similarly have come from a water-side colony rather than from plants growing on site. The depth of water must have been too great to permit colonization by horsetails.

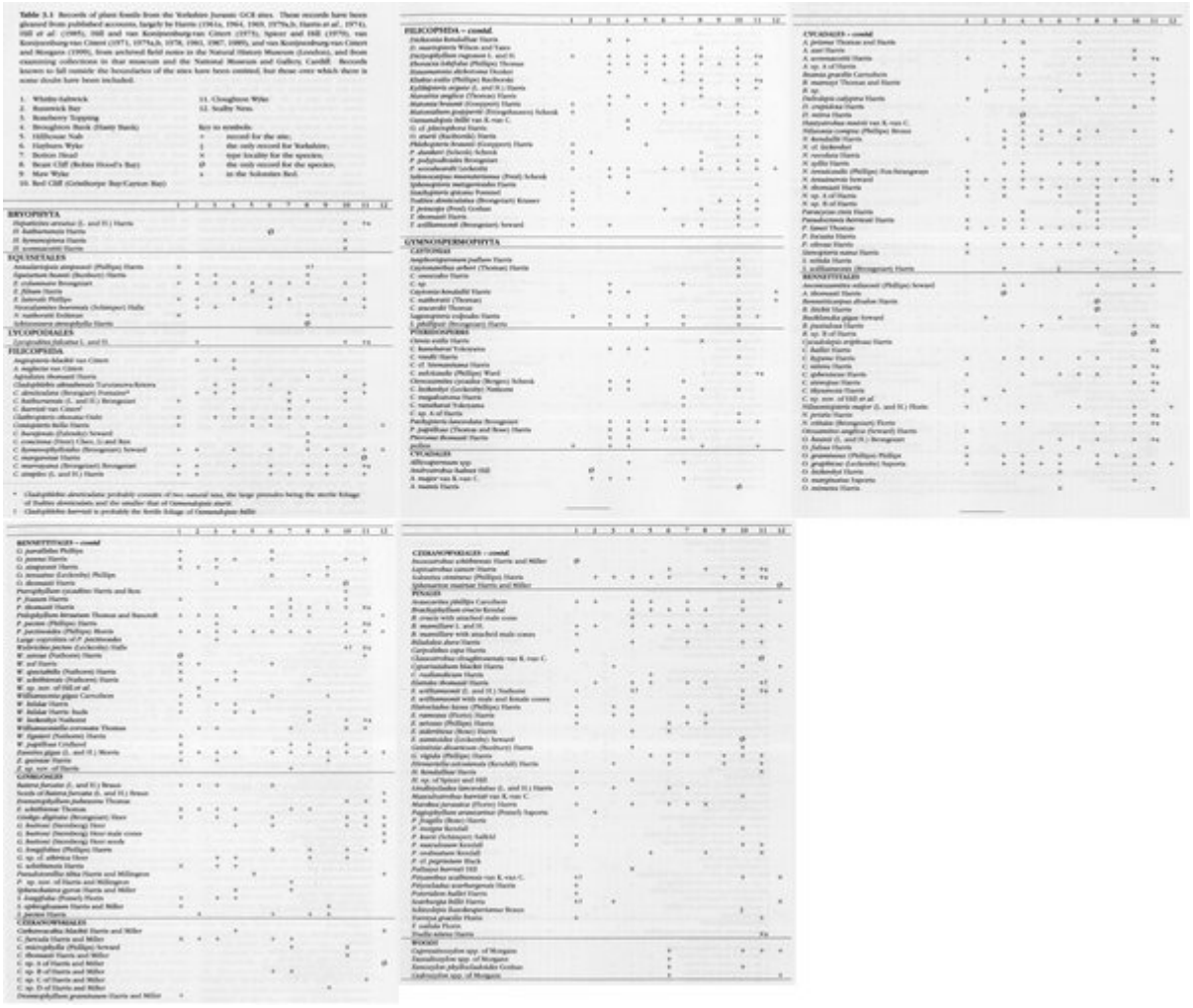
Conclusions

The Botton Head flora is dominated by conifers and bennettites. A number of their reproductive organs have yet to be described. The variation in composition offers future possibilities for discovering associations of vegetative and reproductive organs that might indicate natural affinities. A detailed study of the plant fragments and spore content of the coaly layer might also reveal a better understanding of the delta vegetation that surrounded the area of deposition.

References



(Figure 3.35) Stratigraphical section for the Botton Head GCR site. (After C. Hill, in manuscript).



(Table 3.1) Records of plant fossils from the Yorkshire Jurassic GCR sites. These records have been gleaned from published accounts, largely by Harris (1961a, 1964, 1969, 1979a,b; Harris et al., 1974), Hill et al. (1985), Hill and van Konijnenburg-van Cittert (1973), Spicer and Hill (1979), van Konijnenburg-van Cittert (1971, 1975a,b, 1978, 1981, 1987, 1989), and van Konijnenburg-van Cittert and Morgans (1999), from archived field notes in the Natural History Museum (London), and from examining collections in that museum and the National Museum and Gallery Cardiff. Records known to fall outside the boundaries of the sites have been omitted, but those over which there is some doubt have been included.