
Pincent's Kiln

[SU 651 720]

Introduction

This small, disused quarry on the north-east side of Theale, Berkshire, is now in the grounds of a hypermarket but some exposure has been retained (Figure 7.17)a and (Figure 7.18). It is one of the few sites where plant macrofossils can be collected from sandy and muddy sediment low in the Reading Formation of southern England. The site is of especial interest as it shows the relationship between the plant-bearing levels and the unconformity with the underlying Chalk.

There has been little published work on the palaeobotany of this site. Plant fossils were mentioned by Collinson *et al.* (1985) and a list of species was published by Crane and Goldring (1991), who also placed the plant-bearing levels in a stratigraphical context.

Description

Stratigraphy

The geology of the site has been described by Whitaker (1872), Blake (1903), Crane and Goldring (1991), and Daley (in Daley and Balson, 1999, p. 78). Approximately 4.5 m of Palaeogene deposits overlie Chalk (Figure 7.17) and (Figure 7.18), the contact being a planar unconformity with extensive burrowing (Figure 7.17)b and (Figure 7.19). The basal 1 m of the Palaeogene strata here consists of glauconitic sands and pebbles of the Upnor Formation, which are interpreted as shallow marine. The Chalk is extensively burrowed by *Glyphichnus* Bromley and Goldring (1992), a probable crustacean burrow. The overlying Reading Formation (Figure 7.17) and (Figure 7.18) is mainly medium to coarse sands with some mudstone lenses. These upper beds cut down into the Upnor Formation and were deposited by a prograding fluvial system.

Palaeobotany

The Reading Formation here has yielded a range of plant fossils (Crane and Goldring, 1991), including the leaves *Lauraceaephyllum stenlobatus* Koch and *Platanus schimperi* (Heer) Saporta and Marion. An important but as yet undescribed fruit and seed flora occurs in sandy scours and fills. Crane and Goldring mention the fruit *Leguminosites gardneri* Chandler (= *Leguminocarpon gardneri* (Chandler) Herendeen and Crane, 1992) and seeds of *Vitis* sp. and an undetermined menispermacean. Collinson *et al.* (1985) described the lycophyte megaspores *Mineriporites mirabilis* (Miner) Potonié and *Erlansonisporites* sp. (Figure 7.20) from the sandy unit.

Interpretation

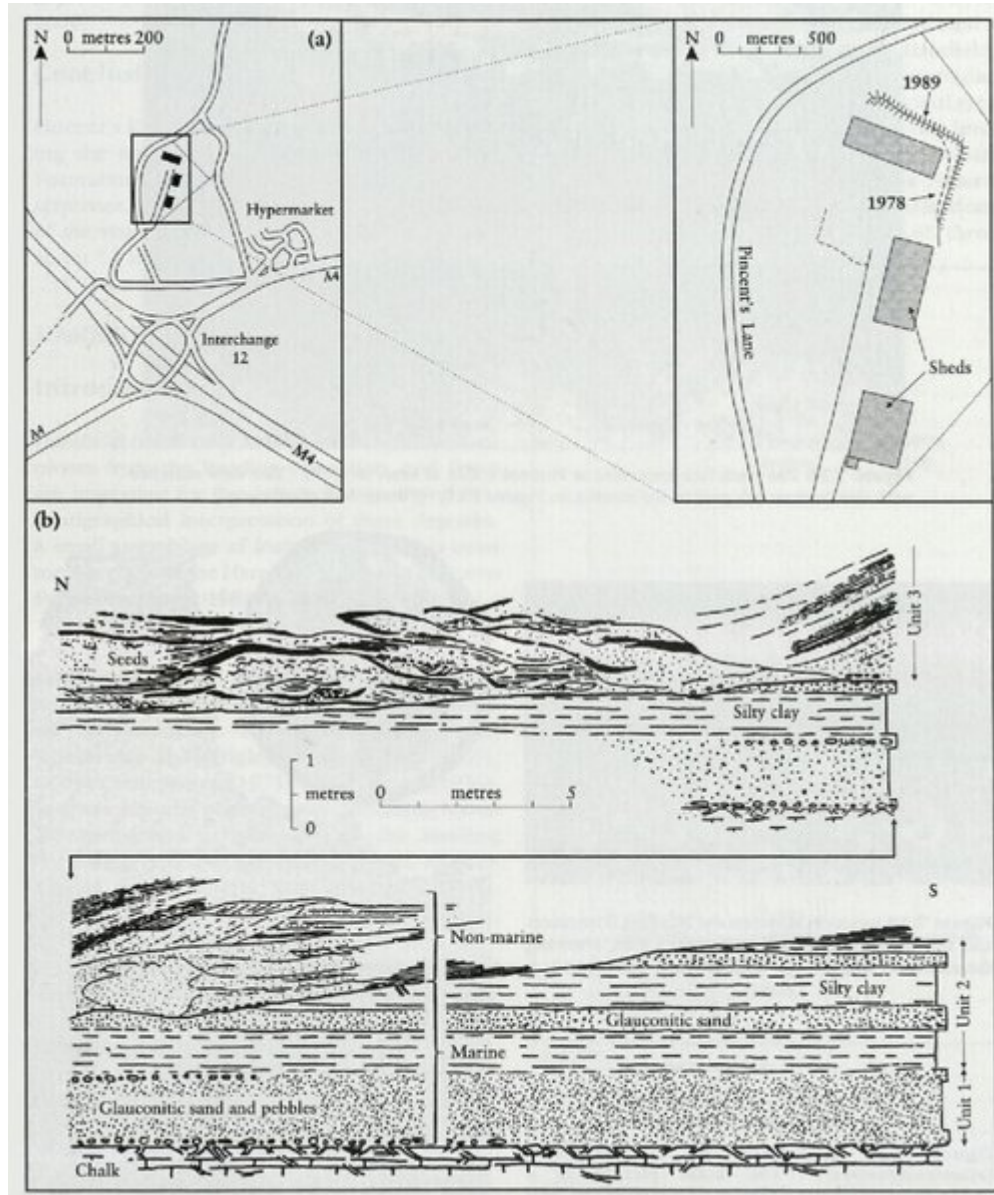
Pincent's Kiln is one of the very few places where plant macrofossils have been found at low levels in the Palaeocene–Eocene transition beds of southern Britain. Although collecting anything more than small specimens is now difficult, it is the only place where the plant-yielding horizons can still be seen in their stratigraphical context with the underlying Upnor Formation and Chalk. The sediments containing the fruits, seeds and megaspores are sandy scours and fills. It therefore complements the Cold Ash site, which has yielded a more diverse assemblage from silty-clay channel fills, and thus helps in the overall interpretation of the Palaeocene–Eocene transition vegetation of southern England.

The lycophyte megaspores *Erlansonisporites* (Figure 7.20) from here have been found to show iridescence comparable to that of precious opal (Hemsley *et al.*, 1994 and references quoted therein). This has led to the establishment of a model of self-assembly in biological systems (Hemsley *et al.*, 1994), currently being investigated experimentally (Hemsley *et al.*, 1998, 2000).

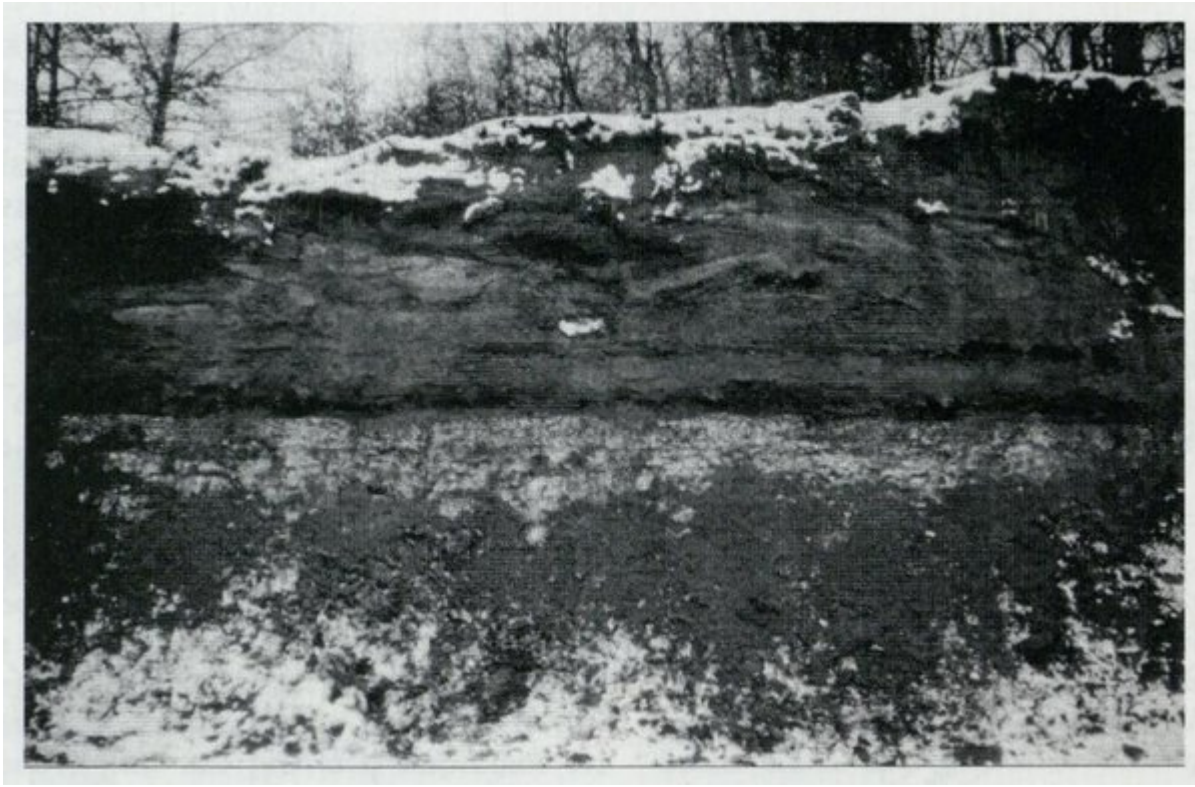
Conclusions

Pincent's Kiln is the best available site for showing the stratigraphical context of the Reading Formation plant-bearing levels low in the sequence, and thus helps in the reconstruction of the vegetational habitats of southern Britain, about 54 Ma ago.

References



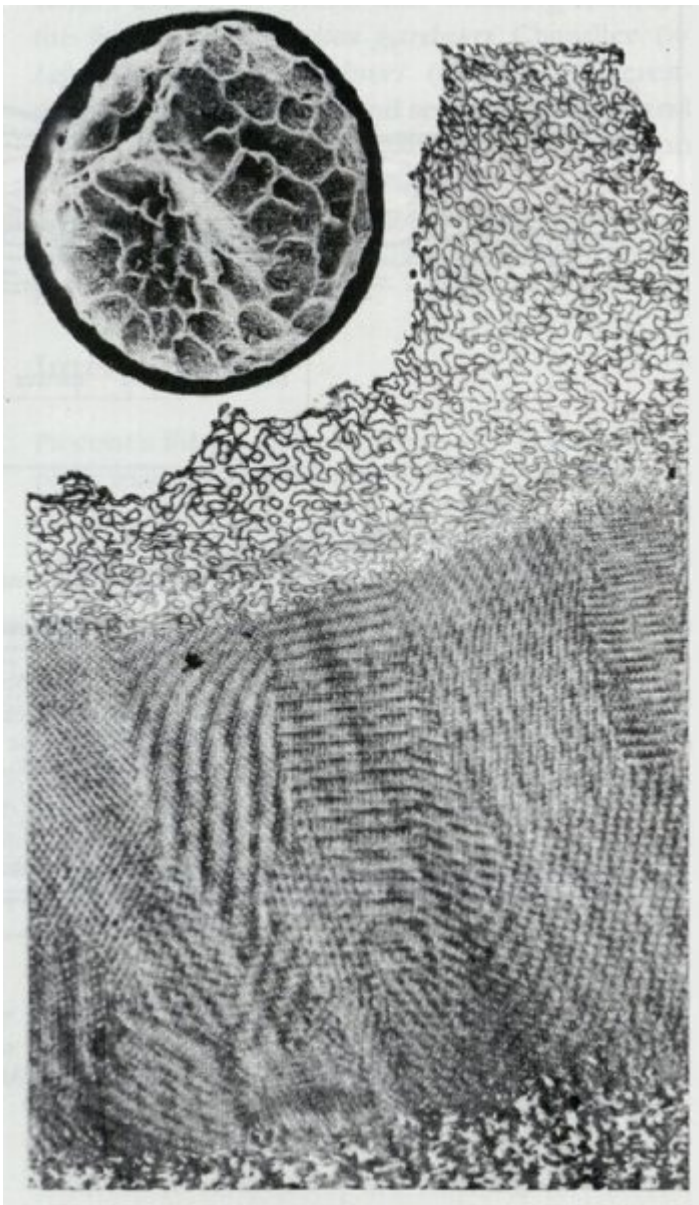
(Figure 7.17) (a) Location and plan of Pincent's Kiln, with faces as at 1978 and 1989. (b) Face as exposed in 1978, with Palaeogene deposits lying unconformably on Chalk. Horizons indicated as marine are the Upnor Formation, non marine are the Reading Formation. (After Crane and Goldring, 1991.)



(Figure 7.18) The back face exposure at Pincent's Kiln as seen in 1978. The view matches with the bottom left part of the section in Figure 7.17. (Photo: M.E. Collinson.)



(Figure 7.19) Junction between the Reading Formation and the underlying Chalk at Pincent's Kiln, showing the extensive burrowing. (Photo: M.E. Collinson.)



(Figure 7.20) Megaspore of the lycophyte *Erlansonisporites*. The main picture is a Transmission Electron Microscope image of the wall structure showing a central layer with colloidal crystal-like organization, $\times 2520$. The inset shows a Scanning Electron Microscope image of the whole spore, $\times 60$. Observation of this spore has led to a major research project testing the hypothesis that spore wall organization can arise through self assembly (see Hemsley et al., 1994, 1998, 2000). (Photo: M.E. Collinson.)