
Wadsley Fossil Forest

Highlights

Wadsley Fossil Forest is the only conserved example of *in situ* fossilized tree stumps in the Coal Measures of Britain (Figure 6.15).

Introduction

This group of *in situ* Westphalian fossil tree stumps was discovered in 1873, during excavations for new buildings, in the grounds of what was then the Wadsley Lunatic Asylum, now the Middlewood Hospital, Sheffield (SK 318 913; Thorpe, 1972). Formerly, out-buildings were constructed to protect the fossils but over the years they have become seriously degraded and covered by debris. However, recent work by Gaynor Boon and other staff of the Sheffield City Museum has uncovered them again, and has allowed the stumps to be re-examined. This account includes information supplied by Ms Boon, which is very gratefully acknowledged. The only published scientific account of the stumps was by Sorby (1875).

Description

Stratigraphy

The stumps occur in sandstones of the Middle Rock Formation, between the Coking and Clay coal seams, and are thus early Langsettian in age. The sandstone is likely to be a crevasse-channel deposit.

Palaeobotany

Sorby (1875) stated that ten stumps were originally present, spread over a distance of 35–45 metres, but the recent re-excavations have only revealed four of these. They are up to 1.5 metres in diameter and show the remains of the stigmarian rooting structures penetrating the underlying seat earth. Although surface details are poorly preserved, Sorby maintained that *Sigillaria*-like markings could just be made out.

Interpretation

A point emphasized by Sorby was that the stumps appear to show a regular distortion. He argued that this reflected a prevailing westerly wind at the time and was apparently impressed by the fact that this was very similar to present-day wind directions in Sheffield! However, Gastaldo (1986) has suggested that similar distortion in the Lower Carboniferous stumps at Victoria Park (see Chapter 6) was a 'streamlining' effect, caused by movement of the entombing sediment.

This is the only place where such stumps are conserved *in situ* in the British Coal Measures. Their significance lies in establishing a palaeoecological model for these strata. There have been a number of attempts to establish such a model using the transported fragments that form the majority of the plant macrofossils found in the Coal Measures (e.g. Scott, 1977, 1978, 1979). Establishing a robust model using such transported fragments is extremely difficult, however, even when there is evidence of the hydrological regime operating at the time; and Gastaldo (1985, 1987) has argued that *in situ* stumps such as those found at Wadsley are the only reliable means of determining plant distribution (see also Cleal, 1987a). The Wadsley stumps appear to confirm that at least parts of the Late Carboniferous palaeoequatorial floodplains were covered by lycopsid forests, rather than pteridosperm-dominated assemblages as suggested in the Scott model.

Conclusion

Wadsley Fossil Forest is the only conserved example in Britain of stumps from the Coal Measures swamp-forests, about 310 million years old. They are the remains of giant club-mosses, probably originally up to 40 metres high, embedded in the fossilized soil in which they grew. Although historically well-known, for many years they had become inaccessible, and were only recently re-excavated to allow their study to be resumed. The site is a rarity, and provides a graphic impression of these ancient forests.

[References](#)



(Figure 6.15) Wadsley Fossil Forest. In situ fossilized tree stumps preserved in the lower Langsettian Middle Rock Formation. (Photo: G. Boon, Sheffield City Museum.)