Saltom Bay

Highlights

Saltom Bay provides the best exposure of the Whitehaven Sandstone, a distinctive sequence of fluvial deposits in the middle Westphalian of the Cumberland Coalfield.

Introduction

The coastal cliffs [NX 962 165] just west of Whitehaven, Cumbria, are in effect the type locality for the Whitehaven Sandstone Formation. The geology is briefly discussed by Eastwood *et al.* (1931).

Description

Approximately 50 m of coarse-grained, cross-bedded sandstones are exposed here. They are mainly grey-purple in colour, sometimes tending to brown. A characteristic feature is the presence of lags of large, red-shale clasts.

Interpretation

This is the best exposure of the Whitehaven Sandstone, a mid-Westphalian arenaceous formation of the Cumberland Coalfield. There have been no studies on the formation since the work of Kendall (1896), Arber (1903) and Eastwood *et al.* (1931), other than the account based on borehole evidence provided by Taylor (1961). There remain significant difficulties in its interpretation, not least in establishing its exact boundaries. For instance, at least some of the strata referred to by Arber (1903) as Whitehaven Sandstone in fact belong to the underlying Productive Coal Formation (Eastwood *et al.,* 1931). Taylor (1961) has argued that there are no clear-cut lithological characteristics that serve to identify the Whitehaven Sandstone, and that it should thus be abandoned as a stratigraphical concept. However, his arguments are not totally convincing and are, rather, an argument for establishing a more coherent lithostratigraphical classification for the Cumberland Coalfield.

Kendall (1896) and Eastwood *et al.* (1931) argued that the sandstone was unconformable on the Productive Coal Formation. However, Kidston *in* Eastwood *et al.* (1931) reported plant fossils from the sandstones which indicated the 'Blackband subdivision of the Staffordian Series' (or what would be called the *Alethopteris serlii* Subzone in the classification of Cleal, 1991); this is not significantly older than the highest strata of the Productive Coal Formation here (*Lobatopteris rarinervis* Subzone of Cleal, 1991 — Thomas and Cleal, 1993).

Trotter (1953) claimed that the 'red' coloration of the Whitehaven Sandstone was primary, but Taylor (1961) argued that it is variable in occurrence, and thus probably of secondary, perhaps Triassic, origin. However, it is difficult to reconcile a secondary origin for the reddening with the presence of *Spirorbis* limestones (e.g. Brockbank, 1891). There would seem to be a clear similarity with the reddened Etruria Formation in the English Midlands, whose coloration was of penecontemporaneous origin, due to a relatively low water-table (Besly and Turner, 1983).

Conclusions

Saltom Bay is the best exposure of the Whitehaven Sandstone, a distinctive sequence of river deposits, about 310 million years old, in the Cumberland Coalfield.

References