
Blake Brook

Highlights

Blake Brook is the international stratotype for the Alportian Stage.

Introduction

This is a small stream section in Lumpool Plantation, 3.5 km SSW of Longnor, Staffordshire [SK 063 612], and lies in the Staffordshire Basin, adjacent to the Wales–Brabant Barrier. It was discovered in the late 1970s, during the search for a stratotype for the base of the Alportian Stage. The only published account of the geology is in the field-guide for the 1981 meeting of the SCCS (Ramsbottom, 1981).

Description

Lithostratigraphy

The exposed sequence here is 48 m thick (Figure 2.3). The lower 29 m belong to the Lum Edge Sandstone Formation, an interval of quartzitic sandstones and mudstones typical of the upper Chokierian of north Staffordshire. This is overlain (with a small stratigraphical gap) by 19 m of dark mudstones with thin limestone bands. It is within this mudstone/limestone interval that the Alportian occurs.

Biostratigraphy

Marine bands

Within the mudstone-dominated upper part of the sequence, ammonoids are extremely common. The lowest horizon to yield them is the thin limestone 3 m above the Lum Edge Sandstones, and containing *Hudsonoceras proteus* (Brown). In the overlying 9.5 m, it is possible to identify the other three biostratigraphical units that typically occur in the Alportian, viz. the *Homoceras undulatum* Zone, and the *Vallites eostriolatum* and *Homoceratoides prereticulatus* subzones (of the *H. prereticulatus* Zone). The fossils here are almost exclusively ammonoids, although one band of mudstone yields bivalves (*Dunbarella*, *Myalina*).

The topmost 7.5 m of strata have yielded ammonoids of the *Reticuloceras circumplicatile* Zone, indicating the lower Kinderscoutian Stage. This includes a mudstone with *Hodsonites magistrorum* (Hodson), taken as the index horizon for the Alportian–Kinderscoutian boundary.

Palynology

Ramsbottom (1981) provides a detailed listing of palynomorphs prepared from 32 horizons in the Blake Brook section. However, the accompanying stratigraphical log does not show where each of the samples originated. A detailed assessment of the palynological evidence is therefore difficult.

According to the data provided by Owens (1982, 1984), the Chokierian–Alportian boundary is virtually impossible to recognize on a palynological basis; both stages belong to the *Lycospora subtriquetra*–*Kraeuselisporites ornatus* Zone. The Alportian–Kinderscoutian is better delineated, coinciding with the base of the *Crassispora kossankei*–*Grumosporites varioreticulatus* Zone. However, none of the index species for the zonal boundary were listed in Ramsbottom's report, except for a single occurrence of *Remysporites magnificus* (Horst) Butterworth and Williams in the lower part of the section (the extinction of this species occurs at the boundary).

Conodonts

Ramsbottom (1981) records conodonts only from the Proteus Marine Band. The quoted assemblage includes the *noduliferus*, *japonicus*, *lateralis* and *inaequalis* varieties of *Declinognathodus noduliferus* (Ellison and Graves), together with *Ozarkodina delicatula* (Stauffer and Plummer). Significant here is the *D. noduliferus* var. *japonicus*, the base of whose range in Britain coincides with the base of the Alportian (Higgins, 1975, 1982).

Chronostratigraphy

The base of the Alportian Stage is defined in this section at the base of the thin limestone containing *Hudsonoceras proteus* Zone, 3 m above the Lum Edge Sandstones.

Interpretation

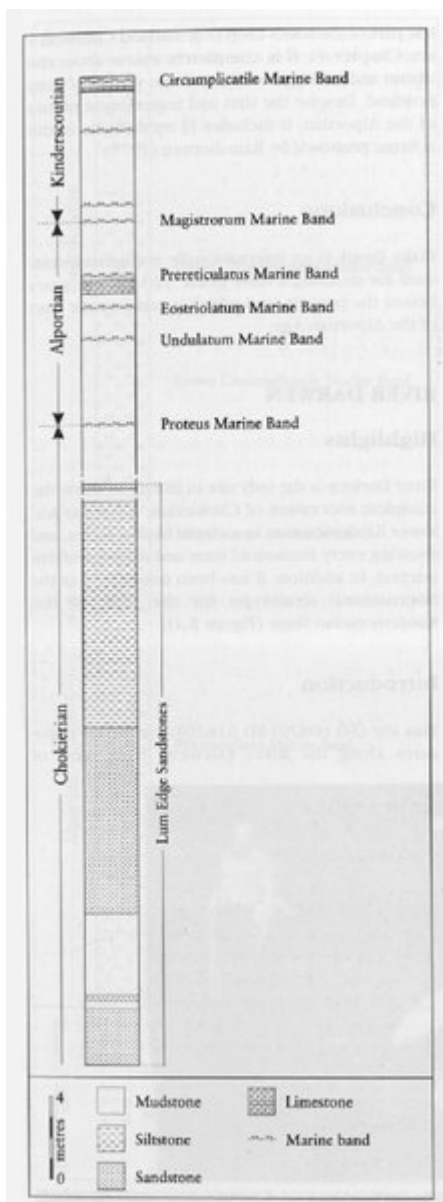
The Alportian Stage was first proposed by Hodson (1957), as part of his dismemberment of the Sabdenian Stage. He defined it in the Alport Borehole in Derbyshire, described by Hudson and Cotton (1943). However, so as to provide a permanent stratotype, Ramsbottom (1969b) proposed that the base of the stage should be defined in the River Darwen section at Samlesbury Bottoms (see below). This in turn was superseded by the present site, following proposals by Ramsbottom (1981), since it yielded better palynological evidence, and provided a complete section of all the marine bands in the stage (albeit in a highly condensed sequence). Subsequently it has been established that all the marine bands are present at Samlesbury Bottoms (Riley, pers. comm.).

At most, the Alportian is only represented by a thin sequence of mudstones in Britain. The most complete sequences through the stage are in northern England, such as here. It is poorly developed in the Culm Trough, except in the deeper-water sequences (e.g. Bonhay Road Cutting — see Chapter 3), while in South Wales it only occurs in the central part of the south crop (e.g. Barland Common see Chapter 4). It is completely absent from the Alston and Askrigg blocks, and also probably from Scotland. Despite the thin and impersistent nature of the Alportian, it includes 1½ mesothems in the scheme proposed by Ramsbottom (1977).

Conclusions

Blake Brook is an internationally recognized standard for defining a time plane 320 million years before the present, and which is taken as the start of the Alportian Age.

[References](#)



(Figure 2.3) Log of section at Blake Brook. Based on Ramsbottom (1981, p. 8.3).