High Smithstone Quarry

Highlights

High Smithstone Quarry (Figure 12.3) is the type locality for the Ayrshire Bauxitic Clay Formation, and includes several coals, suggesting that the clays are transported weathering-products of basaltic lavas.

Introduction

This quarry [NS 279 455] 1 km NNE of Stevenston Loch, about mid-way between Dalry and Stevenston, Strathclyde, Scotland, shows an unusual deposit known as the Ayrshire Bauxitic Clay Formation, which has been used as a source of alum and of specialist refractory clays. The site is mentioned by Monro *et al.* (1983) and Monro (1985).

Description

The exposed sequence here is about 45 m thick (Figure 12.4). The lowest beds seen consist of about 1.5 m of dark, marine mudstone, immediately overlying basaltic lavas. Monro (1985) refers to the latter as the Passage Group Volcanic Formation, which has also been identified further west in Machrihanish (Kintyre) and Ulster. In Ayrshire, this basaltic lava-pile is thought to have been associated with movement along the Inchgotrick Fault, and represents the last major volcanic episode in this part of the Scottish Basin.

The marine mudstone is overlain by a succession of mainly alumina-rich argillaceous deposits, known as bauxitic clays. It is now generally accepted that they were derived from the underlying basaltic lavas, representing transported lateritic weathering-products (Monro *et al.,* 1983; Monro, 1985). Associated with these clays are a number of coals and seat earths, showing no evidence of baking.

Although a marine mudstone has been reported from the lower part of the succession here, no details of its fauna have been given.

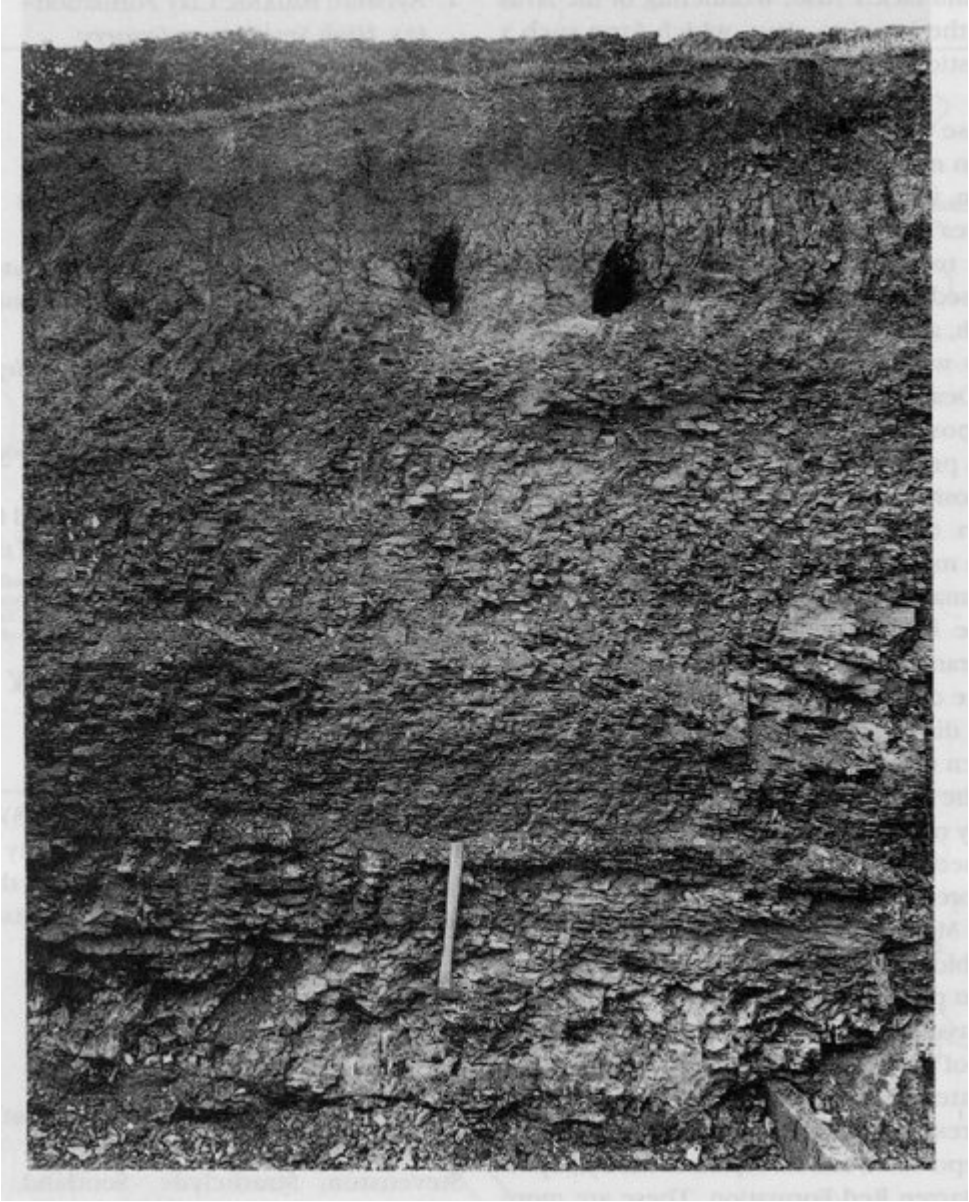
Interpretation

This is the best available exposure of the Bauxitic Clay Formation in the Namurian of the Scottish Basin, and may be taken as its type locality. It is the thickest development of the formation that can be seen at surface outcrop. Also, and more significantly, it shows well developed coals and seat earths, together with a marine mudstone immediately overlying the basalts, with no evidence of high temperature alteration. This was one of the key factors that caused Monro *et al.* (1983) to conclude that, at least at Smithstone, the clays were mainly transported weathering-products. Further south, (south of the Dusk Water Fault), the formation is much thinner and may partly include some *in situ* weathering-products, that formed a crust on the lava-pile. This probably reflects the closer proximity of these more southerly exposures to the volcanic centre.

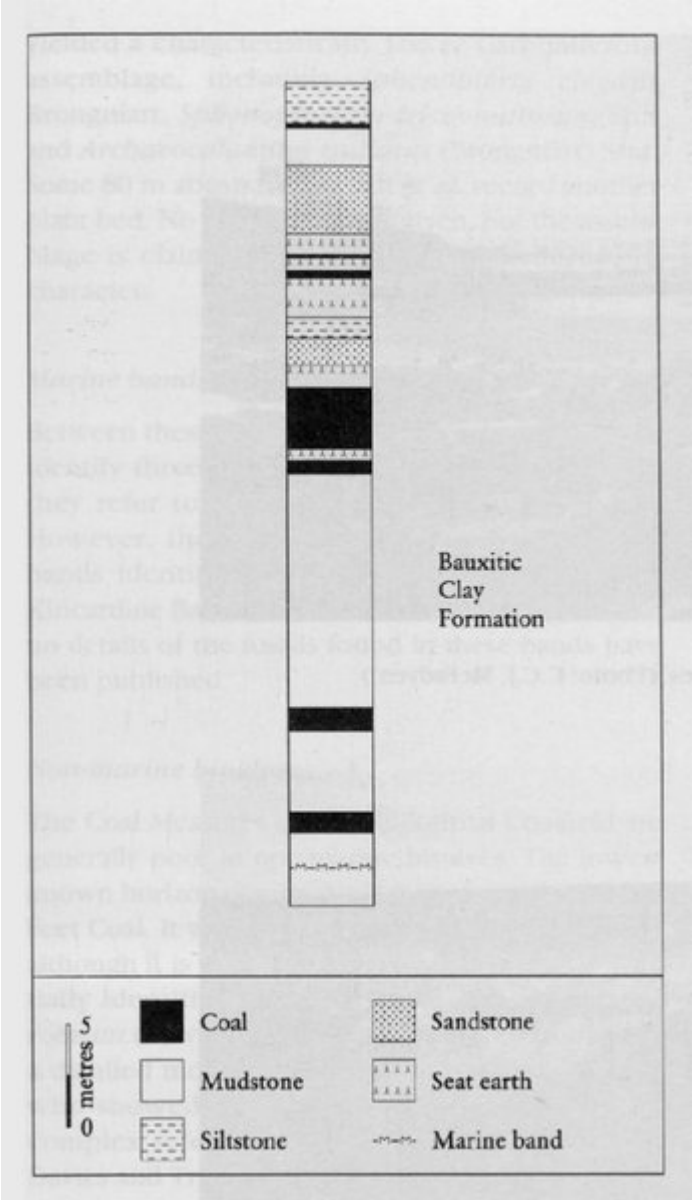
Conclusions

High Smithstone Quarry is the best locality for a distinctive suite of rocks of Namurian age (probably just over 315 million years old), and known as the Ayrshire Bauxitic Clay Formation. They are thought to be the transported weathering-products of basaltic lavas.

References



(Figure 12.3) Opencast in bauxitic clay at High Smithstone. Reproduced by permission of the Director, British Geological Survey: NERC copyright reserved (C2427).



(Figure 12.4) Bauxitic Clay Formation present at High Smithstone Quarry. Based on Monro (1985, fig. 7).