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# Corrie Foreshore

## Highlights

Corrie Foreshore provides the best exposure of Westphalian deposits on the western margins of the Scottish Basin.

## Introduction

Foreshore exposures [NS 026 432] by the post office at Corrie, on the east coast of the Isle of Arran, Cunninghame, Strathclyde, Scotland, show beds of the Productive Coal Formation, as developed on the western margins of the Scottish Basin. The site has been described by Gunn (1903), Gunn *in* Tyrrell (1928) and Leitch (1942).

## Description

### Lithostratigraphy

The exposed sequence here is 85 m thick, and lies unconformably on Lower Carboniferous limestones (Figure 12.10). The lower 53 m consists mainly of a sequence of alternating sandstones and seat earths. At least some of the sandstones are cross-bedded and have an erosive base. The lower sandstones are white, but those higher in this interval have picked up a secondary iron staining, probably from the overlying Permian red sandstones. Gunn (1903) and Gunn *in* Tyrrell (1928) suggested that they may belong to what is now referred to as the Passage Group, but Leitch (1942) and all subsequent authors have referred them to the Coal Measures.

Above the sandstone/seat earth interval are 28 m of more argillaceous strata. Although there is one seat earth in the lower part of this interval, most of it consists of lacustrine shales, with some thin sandstones probably representing crevasse-splay deposits. Particularly the shales have a secondary red coloration.

The top 4 m of the succession see a return to sandstone. They are strongly cross-bedded and in places shows convoluted bedding. This was interpreted by Bailey (1926) as the result of synsedimentary slumping down a palaeoslope.

### Biostratigraphy

#### Non-marine bivalves

These were found at three levels within the red shales in the upper part of the succession. All three assemblages clearly belong to the *A. modiolaris* Zone. The lowest bed was reported by Leitch (1942) to yield *Carbonicola oslancis* Wright and *C. cf. rhomboidalis* Hind. He compared it with an assemblage reported from Kiltongue Mussel Bed of the Central Coalfield (Weir and Leitch, 1936), and would now be referable to the *Carbonicola cristagalli* Subzone (upper Langsettian).

The upper two non-marine bivalve horizons contain shells of the *Anthracosia regularis* Subzone, indicating the upper Langsettian. In addition to the eponymous species, Leitch records '*Carbonicola elliptica*', which is now regarded as a synonym of *A. regularis* (Trueman) (see Trueman and Weir, 1952), as well as *Anthracosia aquilina* (Sowerby) and *Naiadites triangularis* (Sowerby). Leitch compared it with a similar assemblage associated with the upper Langsettian Blackband Coal of the Central Coalfield (Weir and Leitch, 1936).

#### Plant macrofossils

Plant fossils have been reported from a thin shale in the lower part of the succession. However, they have not been described in detail, or even a species list published. This is unfortunate, as they occur in that part of the succession for which there has been doubt as to whether it is Namurian or Westphalian, and for which the plant fossils might provide an

answer.

## Interpretation

This is the best exposure of Upper Carboniferous rocks on Arran, representing marginal deposits at the western end of the Scottish Basin. There are a number of other exposures of Upper Carboniferous rocks on Arran, including both coastal and inland stream sections (reviewed by Leitch, 1942). However, none of the stream sections offer the same opportunity to examine the sedimentology of these beds as can be done at Corrie. The coastal exposures near the Cock of Arran are comparable in extent, and in some features are better (e.g. the slumping of the upper sandstones), but there is not the same quality of biostratigraphical control as at Corrie.

The sequence here is far more condensed than comparable strata in the central part of the basin, at least if Leitch's (1942) correlation of the lower and middle mussel bands with the Kiltongue and Blackband mussel bands of the Central Coalfield is correct. The latter two bands in the Kincardine and east Fife areas are separated by some 60 m, whereas in Arran the two bands are separated by only about 1 m of sandy shales.

Leitch (1942) pointed out a number of other major differences between the Arran sequences and the more typical Productive Coal Formation of the Scottish Basin, such as the absence of coals, despite the occurrence of thick seat earths, and the presence of slump-structures in some of the sandstones. In addition, the sequence is considerably more are-naceous, especially in the lower part of the succession. The alternation of cross-bedded sandstones and seat earths in the lower part of the Collie succession in fact finds its closest comparison with the Westphalian of the English Midlands, where the Pennines Basin laps up against the Wales–Brabant Barrier. Another probable comparison is with the condensed succession at Machrihanish on Kintyre (Manson, 1957; Johnstone, 1966), although this has still to be described in detail.

## Conclusions

Corrie Foreshore is the best place to examine the rocks of Westphalian age (about 313 million years old), as developed on the western margins of the Scottish Basin. The sequence here, which consists mainly of sandstones and seat earths, is much thinner than in the central part of the basin, such as near Edinburgh. It can be compared with similarly marginal deposits of the Pennines Basin, in the English Midlands (see Chapter 7).

## [References](#)

