Skolie Burn, West Lothian

[NS 984 619]–[NS 987 624]

Introduction

The Skolie Burn is a tributary of the Briech Water and, 0.9 km west of Addiewell Station, a stream section [NS 987 624]–[NS 984 619] in it provides the best section of the upper part of the Lower Limestone Formation and the basal beds of the Limestone Coal Formation (late Brigantian and early Pendleian) on the eastern side of the Central Coalfield. The section has been described by Macnair (1917) and Macgregor and Anderson (1923). Further information relating to the site is given by Cameron *et al.* (1998).

Description

The section overlies an intrusive picrite sill and the basal beds of the sequence are baked at the sill contact. The sequence, which is 20 m thick, is largely argillaceous and includes at least three of the four marine horizons collectively known as the Hosie Limestones' (Figure 2.22). The lowest marine band is a sandy limestone (1.2 m) resting on baked sandstone (2.0 m). Above this, 2 m of dark shale are overlain by a second prominent marine horizon, an argillaceous limestone bed (1 m) that passes up into a sequence of shale with thin argillaceous limestone inter-beds (2.6 m) which are also of marine aspect. *Lingula* has been recorded from the shales immediately above the basal sandy limestone bed (Macgregor and Anderson, 1923) and a diverse brachiopod-dominated marine fauna including productoids (*Eomarginifera*), rhynchonellids and spiriferoids has been recorded from the lower two limestones (Cameron *et al.*, 1998). In addition, trepostomous bryozoans and the bivalve *Posidonia membranacea* are present (Cameron *et al.,* 1998). These marine beds pass up into a dark fireclay that becomes sandy towards its top (1.8 m), and this is overlain by a coal (0.4 m). Above this are further argillaceous fireclays with stigmarian roots (2.3 m) capped by a thin, nodular, calcareous band with rootlets (0.15 m). This is sharply overlain and separated from another marine horizon by 1.5 m of dark shale. This marine unit, a thin crinoidal limestone (0.6 m), is separated from the argillaceous limestone (1.8 m) of a further marine horizon by fossiliferous shales (1 m). Above this limestone, 4 m of dark shales with siderite nodules are recorded and a marine fauna at their base includes abundant specimens of *Posidonia corrugata.*

Interpretation

The predominantly argillaceous sequence shows marine limestones and shales separated by a unit of coal and fireclays, and the presence of *Posidonia membranacea* and the abundance of *Posidonia corrugata* confirms that these are at the horizon of the Hosie Limestones (Wilson, 1989). These limestones have not been given local names in the Skolie Burn area, and Macgregor and Anderson (1923) named them by correlation with the Carluke area, 18 km to the south-west, from which area the collective term llosie' is probably also derived. The Hosie Limestones sequence varies considerably across the Midland Valley (Wilson, 1989) but typically contains four marine horizons. In the Paisley area these are known in ascending order as the Main Hosie Limestone, Mid Hosie Limestone, Second Hosie Limestone and Top Hosie Limestone (Hinxman *et al.,* 1920; Whyte, 1981; Wilson, 1989; and see (Figure 2.4)) and the equivalents in the Carluke region are the Birkfield Limestone, First Kingshaw Limestone, Second Kingshaw Limestone and Lingula (or Top Hosie) Limestone respectively (Hinxman *et al.,* 1921; Whyte, 1981). Macgregor and Anderson (1923) considered that the two limestone bands below the coal and fireclay at Skolie Burn were the equivalents of the Birkfield (Main Hosie) Limestone and First Kingshaw (Mid Hosie) Limestone, but more recently Cameron *et al.* (1998) have re-correlated both of these limestones and the intervening marine beds with the Mid Hosie Limestone. The two marine limestones above the coal and fireclay are correlated with the Second Kingshaw (Second Hosie) Limestone and the Top Hosie Limestone (Macgregor and Anderson, 1923; Cameron *et al.,* 1998). At several localities in the Central Coalfield these two horizons may be difficult to separate and form a compound marine band. The coal and fireclay horizon in the centre of the Skolie Burn section is the local equivalent of the Lillie's Shale Coal and Hosie Fireday horizon of the Paisley district (Hinxman *et al.,* 1920; Magregor *et al.,* 1925). This is a widespread though highly variable horizon, which may mark a disconformity in

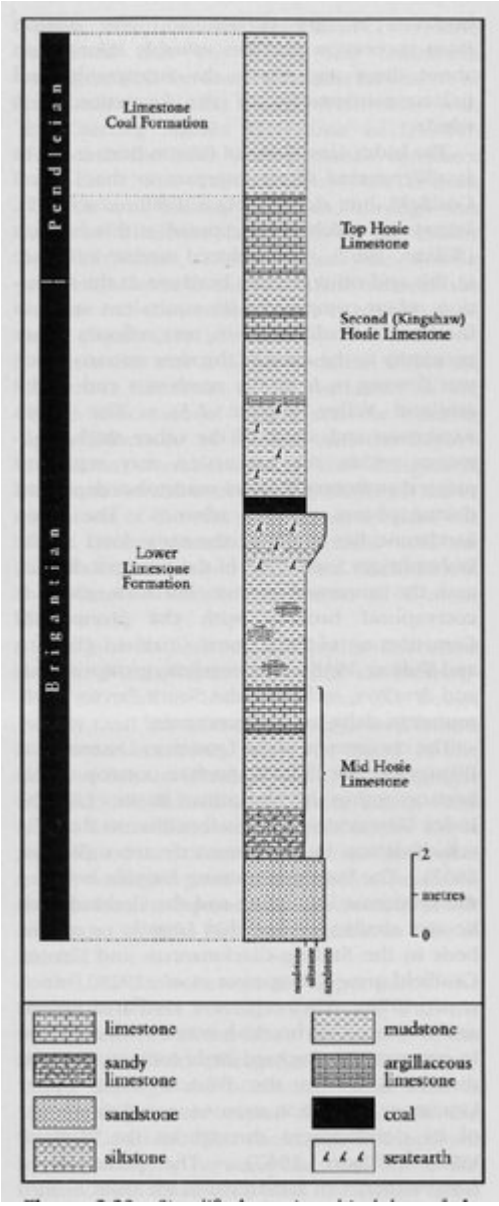
the sequence (Whyte, 1981). The top of the Top Hosie Limestone is the marker for the top of the Lower Limestone Formation (Browne *et* al., 1999) and in the Skolie Burn section the uppermost shales thus belong to the base of the Limestone Coal Formation.

The correlation of the Hosie Limestones in Fife and Midlothian and in the Bathgate Hills, where they are interbedded with volcanic rocks (Cameron *et al.,* 1998), has presented many difficulties (Wilson, 1989) due to their different and highly variable development In these areas. The Skolie Burn sequence is the only good section at this level on the eastern margin of the Central Coalfield and this fossiliferous sequence thus forms a vital link in correlating this group of strata between eastern and western Scotland.

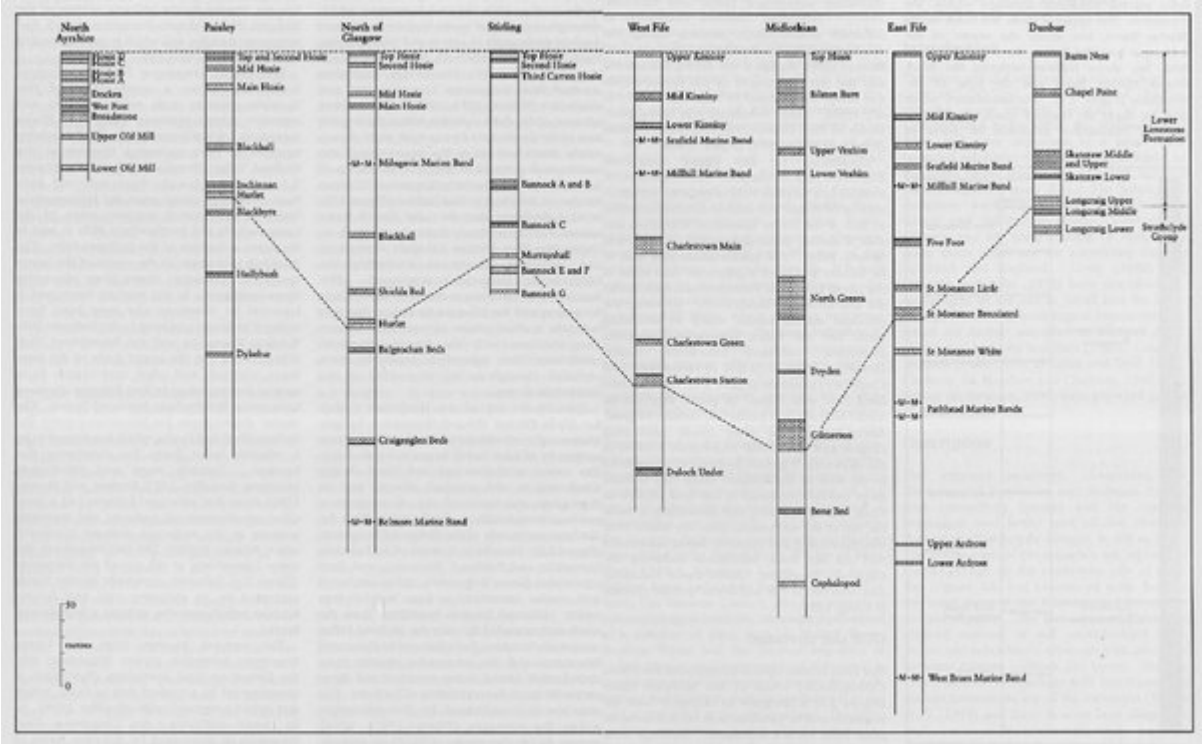
Conclusions

The Skolie Burn GCR site shows an excellent late Brigantian to early Pendleian section through the Hosie Limestones and associated, largely argillaceous, strata at the top of the Lower Limestone Formation and base of the Limestone Coal Formation. With its central position within the Midland Valley, the section and its fossils are of vital stratigraphical importance in correlating these late Dinantian and early Silesian rocks across the Midland Valley of Scotland.

References



(Figure 2.22) Simplified stratigraphical log of the Lower Limestone Formation and Limestone Coal Formation (Clackmannan Group) at the Skolie Bum GCR site.



(Figure 2.4) Correlation of the principal marine horizons in the Brigantian Lower Limestone Formation and uppermost part of the Strathclyde Group in the Midland Valley from North Ayrshire to Dunbar. Note that most of the named units figured here are, unless otherwise stated, limestones (names abbreviated). Based on various sources and including information from George et al. (1976), Cameron and Stephenson (1985), Wilson (1989) and Francis (1991).