
LITTLEMILL

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OS Grid Reference: NH705365

Highlights

The landforms at Littlemill provide an excellent example of a system of large, parallel eskers formed during the melting of the Late Devensian ice-sheet.

Introduction

The site at Littlemill (NH 695352–NH 717377) extends over a distance of *c.* 3.5 km south-west of Daviot in Strathnairn and includes a system of subparallel esker ridges, kames and kettle holes which together comprise an outstanding assemblage of glaciofluvial landforms. They relate to the wastage of the Late Devensian ice-sheet, forming part of a more extensive suite of related deposits in Strathnairn between Brinmore and Daviot (Harris and Peacock, 1969; Mykura *et al.*, 1978). There have been no detailed studies of the Littlemill landforms. Early descriptions were published by Fraser (1880) and Cameron (1882a, 1882b). In addition, the site has been figured in publications by Sissons (1967a, plate XIII A) and Gray (1991, figure 315).

Geikie described the main characteristics of the Littlemill eskers, commenting that "the observer will find one of the most remarkable groups of glacial ridges in the north of Scotland" (1901, p. 497). In the Geological Survey Memoir to the area Horne (1923) referred to a number of boulders scattered over the ridges at their northern end and suggested that they might be partly morainic in origin. Gregory (1926) included a note on them in his survey of Scottish kames, and they have also been recognized and mapped by Harris and Peacock (1969), Small and Smith (1971), Smith (1977), Mykura *et al.* (1978) and Synge and Smith (1980).

Description

The key features occur in a topographic embayment on the east side of the valley and comprise four major and several minor, subparallel esker ridges (Figure 7.14). Typically they are about 15 m high but in places reach as much as 40 m. Their maximum length is almost 2 km. North-east of Littlemill Farm (NH 365372) the eskers converge in a broad, flat-topped mound. A second large mound immediately to the north displays hummocky and linear forms and kettle holes on its surfaces. Fine kettle holes also occur between the main esker ridges, whose striking topographic expression is spectacularly displayed in Sissons (1967a, plate XIII A). In the north-east part of the site, excellent exposures have been revealed in eskers and associated mounds in the large sand and gravel quarry at Mid-Lairgs, with both transverse and longitudinal sections present. There is considerable variability between sections in the type of material present, ranging from entirely coarse gravel to bedded sands and gravels (see also Harris and Peacock, 1969; Mykura *et al.*, 1978). Large-scale arch bedding was formerly displayed in one transverse section through an esker ridge (1980). At the south-west end of the system, sections in a forestry pit (NH 698354) reveal gravel and sand with boulders up to 0.5 m in size.

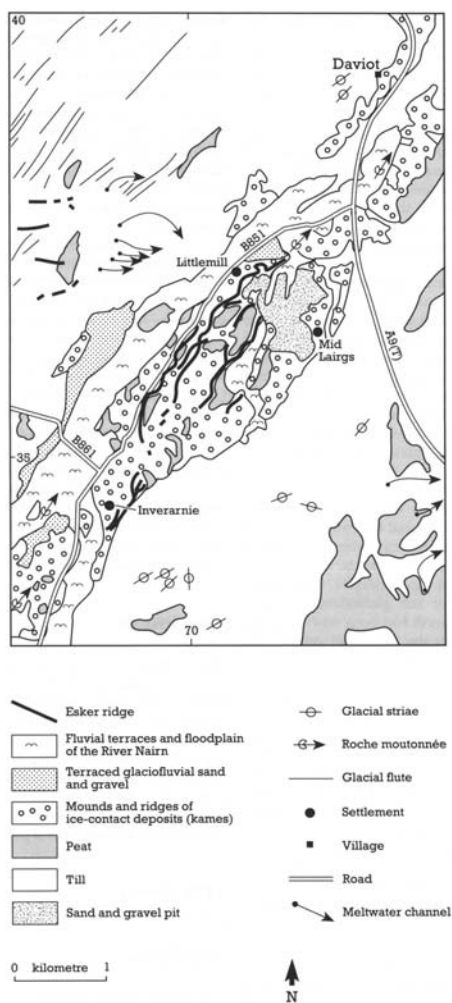


Figure 7.14: Geomorphology of the Littlemill esker system between Inverarnie and Daviot (from mapping by J. W. Merritt for the British Geological Survey 1:50,000 Geological Sheet 84W (Fortrose), in press).

Additional interest in the site includes an excellent example of roches moutonnées at Scatraig (NH 713376).

Interpretation

There are few specific references in the literature to the Littlemill landforms. Fraser (1880) interpreted the ridges as lateral moraines, although he noted that they differed from other moraines in their composition of sand and gravel. He suggested that the material accumulated along a glacier margin where it was reworked and stratified by glacial meltwater. Cameron (1882a) noted sand and gravel mounds and terraces north of Littlemill, which he explained in terms of marine submergence. In a subsequent paper (Cameron, 1882b), he extended his observations to include the Littlemill landforms, which he described as kames. He noted sections showing large rounded gravel and, in places, sand layers. Cameron disagreed with "some geologists" who had proposed a subglacial origin for the ridges, arguing instead that extensive deposits, formed during marine submergence, were later dissected by overflow and drainage from lakes which they dammed. This latter explanation, however, is now discounted in favour of the former: the deposits were probably formed either by an englacial or subglacial meltwater drainage system.

The Littlemill eskers are particularly notable for their size and extent. Although part of the system has been extensively quarried and part is afforested, the intact ridges show clearly defined esker morphology. The individual ridges are generally similar in form to single eskers elsewhere in the area; for example at Torvean, Edderton, Dornoch, Alness and Brora. The key additional interest that distinguishes the Littlemill features centres on the system of forms there and their spatial arrangement: they are one of the finest examples of a system of

subparallel esker ridges in the country. In so far as the key interest lies in the complete network of forms, the Littlemill eskers provide an interesting contrast with the system of braided eskers at Kildrummie Kames (see above). These two sites complement each other, illustrating different types of former glacial drainage pattern. Tentatively, the morphological differences between these two sites may also reflect different origins. The Littlemill landforms appear to be more typical of eskers formed in a subglacial or near subglacial position, whereas those at Kildrummie may have formed in braided channels incised into the surface of buried ice (*cf.* Carstairs Kames). The quarry at Mid-Lairgs, together with the small forestry gravel pit at the southern end of the site, provides an excellent opportunity to relate esker morphology and sedimentology. Apart from the study of Middle Mause esker by Terwindt and Augustinus (1985), there are no published modern studies of the detailed sedimentology and palaeohydrology of Scottish eskers.

Conclusions

Littlemill is an important landform site, providing a particularly good example of large esker ridges aligned in a parallel arrangement. They were formed by meltwaters during the wastage of the last (Late Devensian) ice-sheet (approximately 14,000–13,000 years ago) and allow an interesting comparison with the braided eskers of Kildrummie Kames, the two sites illustrating different types of glacial drainage system and possibly differences in the details of origin of the landforms.

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