Dipple Brae

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Highlights

Dipple Fish Bed in Highland is famous as one of the first sites to yield specimens of fossil fishes from the Scottish Old Red Sandstone, with the first finds reported in the 1830s. The fish bed is younger than the widespread Achanarras horizon fauna at nearby Tynet Burn. Seven or eight species of primitive fishes have been extracted from the nodules in the Dipple Brae Fish Bed, and the importance of the site is its age.

Introduction

At Dipple Brae, near Fochabers in Moray (Highland), the Dipple Fish Bed was once quarried for lime, and the remains of these workings can be seen along the north bank of the stream. The Fish Bed was discovered in 1838 by J.G. Malcolmson (Murchison, 1839; Andrews, 1982), when he located also the fish beds at Lethen Bar, Clune and Tynet Burn. The discoveries by Hugh Miller in Cromarty, plus the founding of the Elgin Museum in 1836, initiated the search for fossil fishes in the Moray area. Malcolmson (1842, 1859) described the specimens, and Gordon (1859) gave more details. Malcolmson and Gordon found that the fishes from Tynet Burn (q.v.) were much better preserved than those at Dipple, and they lost interest in the latter site. Probably Agassiz never saw any material from Dipple, and collectors in the 1830s and 1840s did not detect any differences between the fishes from Dipple and those from the other Moray Firth sites.

There was probably a good exposure of the section at Dipple when it was visited by Malcolmson. He was able to produce a detailed section through the area (Malcolmson, 1859, pl. 11). Later, the outcrop of the fish bed became completely covered with talus from the lime workings, and nodules could only be collected from fields in the neighbourhood (Gregory, 1860). In the 100 years following its discovery Dipple attracted the attention of Duff (1842), Gordon (1859), Gregory (1860), Wallace (1879), Traquair (1895), Mackie (1902), Mahood (1919) and A.G. Malcolmson (1921). In the 1960s the British Geological Survey reopened the fish bed site and produced a section (Peacock *et al.,* 1968; (Figure 6.23)).

Description

The Dipple Fish Bed lies higher in the Middle Old Red Sandstone sequence of the Elgin–Forres area than the Tynet Burn Fish Bed (q.v.). It consists of 1.5 m of purple and red shales with limestone nodules, within a sequence of red sandstones and conglomerates of Middle Devonian age (Peacock *et al.,* 1968; Westoll, *in* House *et al.,* 1977).

Before the stratigraphical revision undertaken by Miles and Westoll (1963), it had always been assumed that the Dipple Fish Bed contained the same fauna as the other fish-bearing nodule beds in the area, all equivalent to the Achanarras horizon. Miles and Westoll (1963) proved that *Dickosteus threiplandi* completely replaced *Coccosteus cuspidatus,* a characteristic member of the Achanarras-horizon fauna, and that the Dipple Fish Bed represented a younger horizon, characteristic of Donovan *et al.* (1974) Zone 4.

Fauna

The fish fauna consists of the following taxa:

Acanthodii: Acanthiformes: Acanthodidae

Mesacanthus sp. (recorded *as Acanthodes pusillus* by Gregory, 1860)

Placodermi: Arthrodira: Coccosteidae

Dickosteus threiplandi Miles and Westoll, 1963

Placodermi: Arthrodira: Homosteidae

Homosteus sp.,

Osteichthyes: Sarcopterygii: Osteolepiformes

Osteolepis sp. (Thomson, 1964, says that this may be *Gyroptychius* n. sp.)

Ostreichthyes: Sarcopterygii: Dipnoi: Dipteridae

Dipterus sp.

From their discovery, it had been noted that the character of the nodules varied between different Moray Firth sites (Traquair, 1895). Dipple yields nodules that are studded with 'little excrescences' each of which contains a scale and represents the nodule formation around a semi-degraded fossil. Specimens of *Gyroptychius* sp. from the Dipple Fish Bed had been partly disarticulated before burial, but otherwise the quality of preservation was excellent and, among structural details that were present, unique casts of the ethmoid endocranial cavity were visible in two specimens, and others showed the arrangement of the small bones of the snout region of the dermal skull roof, which is also very uncommon (Thomson, 1964).

Interpretation

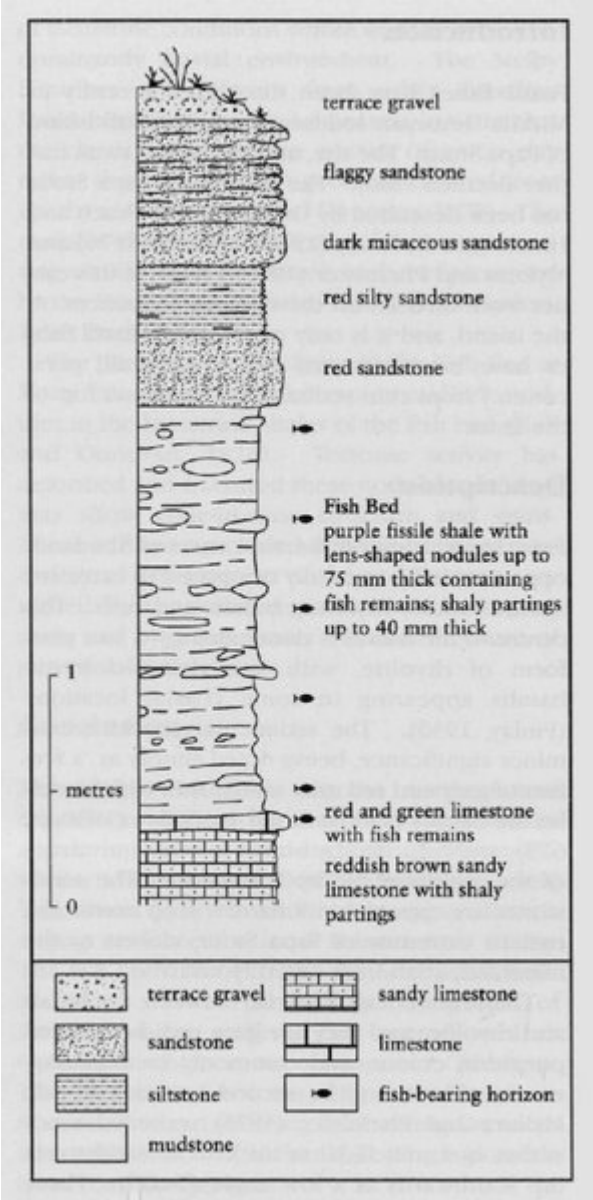
Dipple represents a temporary extension southwards of a lake which formed in Faunal Zone 4 times (Donovan *et al.,* 1974), allowing *Dickosteus, Osteolepis* and *Gyroptychius* to enter the area from lake waters farther north. In such an isolated environment new species may ultimately have evolved (Donovan, 1980).

Conclusion

Dipple Fish Bed was always rejected as a poor site by comparison with the other nodule beds of the Moray Firth area which yield beautifully preserved fossil fish. However, it yields a fauna younger than at Achanarras, and contains species that do not occur within the lower nodule beds, hence its conservation value. At Fish Zone 4 (Donovan *et al.,* 1974) there are no other nodule beds, only flattened specimens from flagstone sites in Caithness such as Spittal Quarry. Nodule beds preserve an extensive morphological details of species, an important aspect of this site.

Further collecting at Dipple is likely to reveal interesting fishes, both from the point of view of preservation and also possible differences to typ ical Zone 4 faunas. Recent excavation has produced well-preserved material, showing the potential of the site (N.J. Hollingworth, pers. comm., 1983).

References



(Figure 6.23) Stratigraphical section through Dipple Brae Fish Bed (based on data from M.A. Rowlands MS).