Newmead

[SO 0563 5426]

Introduction

Newmead Scar and outcrops in the vicinity are significant because they expose examples of coarse shallow-water sediments associated with the main development of the Builth Volcanic Formation in the southern part of the Builth–Llandrindod inlier. It is the relationship between these sediments and the volcanics that led Jones and Pugh (1949), by careful and detailed mapping on a large scale, to their classic description of an early Ordovician shoreline, which must be one of the earliest examples of a detailed palaeogeographical reconstruction.

The epiclastic sandstones and conglomerates of the Newmead Formation are a shallow-water facies of the *murchisoni* Zone that crops out between Coed-cae, about 1 km to the north of this site, and Llanelwedd, at the extreme southern end of the Builth Inlier. Some horizons within this formation have yielded abundant faunas dominated by articulate brachiopods, as, for example, at Tan-Lan, near Newmead Scar (see below) and at Tan y Graig Quarry [SO 475 528] to the south. These and other coeval benthic brachiopod communities were used in the analyses of Williams *et al.* (1981) and Lockley (1983).

The overlying mudstones of the Llanfawr Mudstones Formation, exposed in a stream adjacent to Newmead Lane, were one of the sources of trilobites for Sheldon's (1987a, 1988) work on phyletic gradualism and populations, and also yielded some of the graptolites described by Hughes (1989) and ostracods described by Jones (1986–1987).

Description

The most important part of this site is Newmead Scar (Figure 8.27), where the highly erosive base of the sandstones of the Newmead Formation can be seen. Here, a vertical face of basalts with some pillow lavas (Baker and Hughes, 1979, p. 71) is capped by some 3 m of grey feldspar sands. The junction is irregular but sharply defined, and the sandstones penetrate some fissures and cavities; in places small patches of sandstone can be seen cemented to the face.

Near Tan-Lan near [SO 057 547], current-bedded epiclastic sandstones (pyritous feldspar sands) have yielded a shelly fauna dominated by the strophomenoid brachiopod *Macrocoelia llandeiloensis* (Davidson) and abundant anchoring spines of the sponge *Hyalostelia fasciculus* (M'Coy). Nearby, flinty mudstones overlying these sandstones form the top of the *murchisoni* Zone and the base of the Llanfawr Mudstones Formation. Dark mudstones with bentonite and tuff horizons belonging to the succeeding *teretiusculus* Zone are exposed in the stream adjacent to Newmead Lane [SO 0488 5422]–[SO 0515 5422] and have yielded a mixed fauna including species of the trilobites *Ogygiocarella, Ogyginus, Cnemidopyge, Bergamia* and *Whittardolithus* and the graptolites *Diplograptus foliaceus* (Murchison), *Hustedograptus* cf. *teretiusculus* (Hisinger) and *Climacograptus sheldoni* Hughes. From this section Jones, (1986, 1987) reported the ostracods *Schallreuteria builthensis* Jones (type locality), *Cymabolbina acanthodes* Jones (type locality) and *Conspicillum ululatum* Jones.

Interpretation

The importance of this site lies with its central place in Jones and Pugh's (1949) description of an early Ordovician shoreline with high cliffs, sea stacks and boulder-strewn beaches. They interpreted the Newmead section as a resurrected cliff that they estimated might have been originally at a height of some 80 m above sea level (Jones and Pugh, 1949, p. 77). They described the surface of the basalt (Tower Spilites') as 'smooth, water-worn and fluted' and suggested that the basalt had undergone subaerial erosion and denudation before deposition of the Newmead Formation. Other outcrops in the vicinity contributed to their interpretation; for example, small inliers of basalt adjacent to a wall e.g. [SO 0585 5387] and [SO 0585 5377] were stated (Jones and Pugh, 1949, p. 77) to be stacks, examples of

which are portrayed in their diorama (Jones and Pugh, 1949, fig. 3, p. 79), and outcrops of conglomeratic boulder beds near Tan-Lan e.g. at [SO 0580 5464] and [SO 0589 5480] were taken to be beach deposits. An eroded surface of basalt [SO 0598 5468] (an outlier of which lies a short distance to the west [SO 0595 5467]) that in parts shows cross sections of pillows has abundant relics of grey feldspar sands adhering to it; it was believed by Jones and Pugh (1948, p. 80) to be a wave-worn surface. Fumes (1978), in an unpublished PhD thesis, reinterpreted some of the Newmead Formation sandstones as being deposited rapidly by a debris-flow or submarine fan, because many of them are structureless, but allowed that some of the rounded boulders probably originated from beach deposits. An onshore source for them is likely (see Lockley, 1983, p. 117) and the Newmead Formation sandstones and conglomerates are the product of constant and rapid erosion and the transport of sediment probably originating from uplift of an active volcanic centre within a marginal basin. The presence of articulate brachiopods belonging to Lockley's (1983) *Hesperorthis* palaeocommunity attests to derivation from an onshore intertidal or shallow subtidal source.

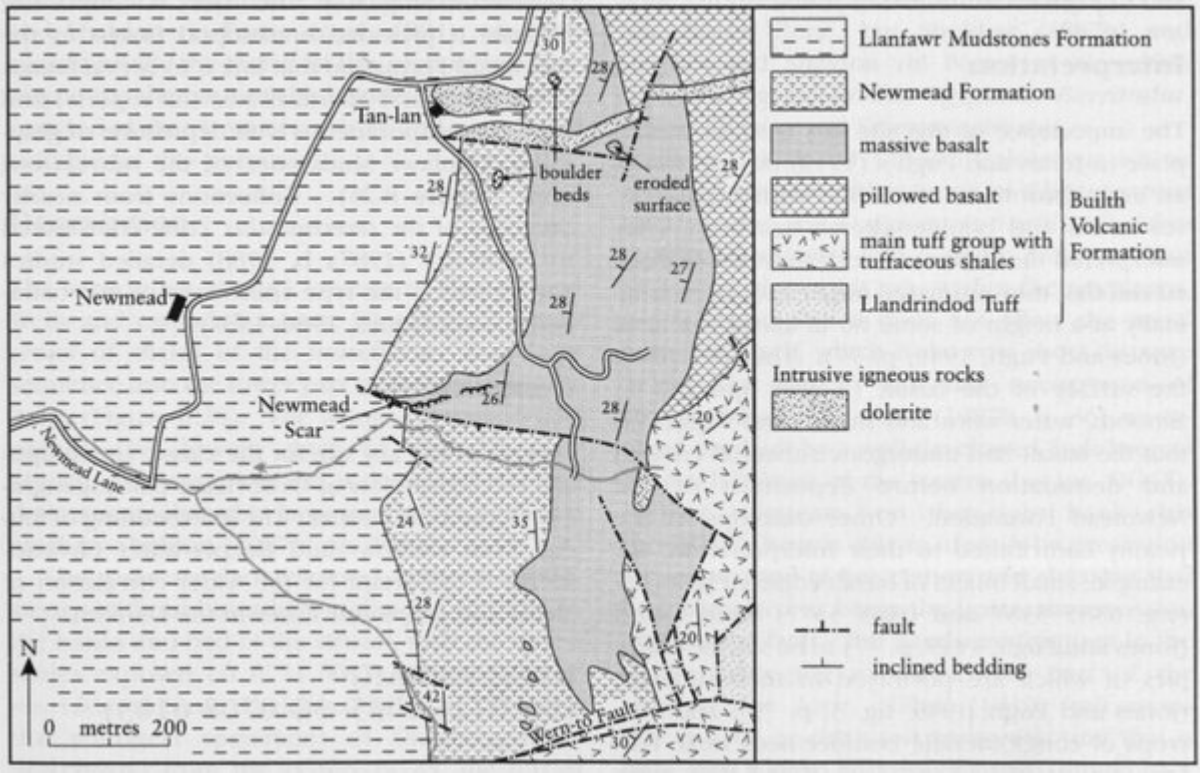
The deposition of the Newmead Formation followed the closing phase of the Builth volcanism, after which the area was subjected only to occasional fine ash falls from a distant centre, as shown by the tuffs and bentonites in shales of the *teretiusculus* Biozone.

Palaeontologically the site is important because it provided brachiopod faunas in the Newmead Formation that link it to coeval faunas at Llandeilo and Ffairfâch (see site reports) and were contemporaneous with deposition of graptolitic Llanfawr Mudstones of the *murchisoni* Zone (Figure 8.25). Collections from nearby outcrops of the *teretiusculus* Zone contributed to Sheldon's (1987a, b, 1988) detailed studies and provided the type specimens of two ostracod species (Jones, 1986–1987).

Conclusions

Newmead is a key site for the classic topographical reconstruction of Ordovician palaeogeography in the Builth Inlier. The interbedding of faunas from shallow- and deeper-water environments is important for the wider correlation of shelly and graptolitic facies in the Llanvirn.

References



(Figure 8.27) Geological map of the area around Newmead, after Jones and Pugh (1949) and Earp (1977). The massive basalt forms small inliers, interpreted by Jones and Pugh as stacks that protrude through the Newmead Formation.

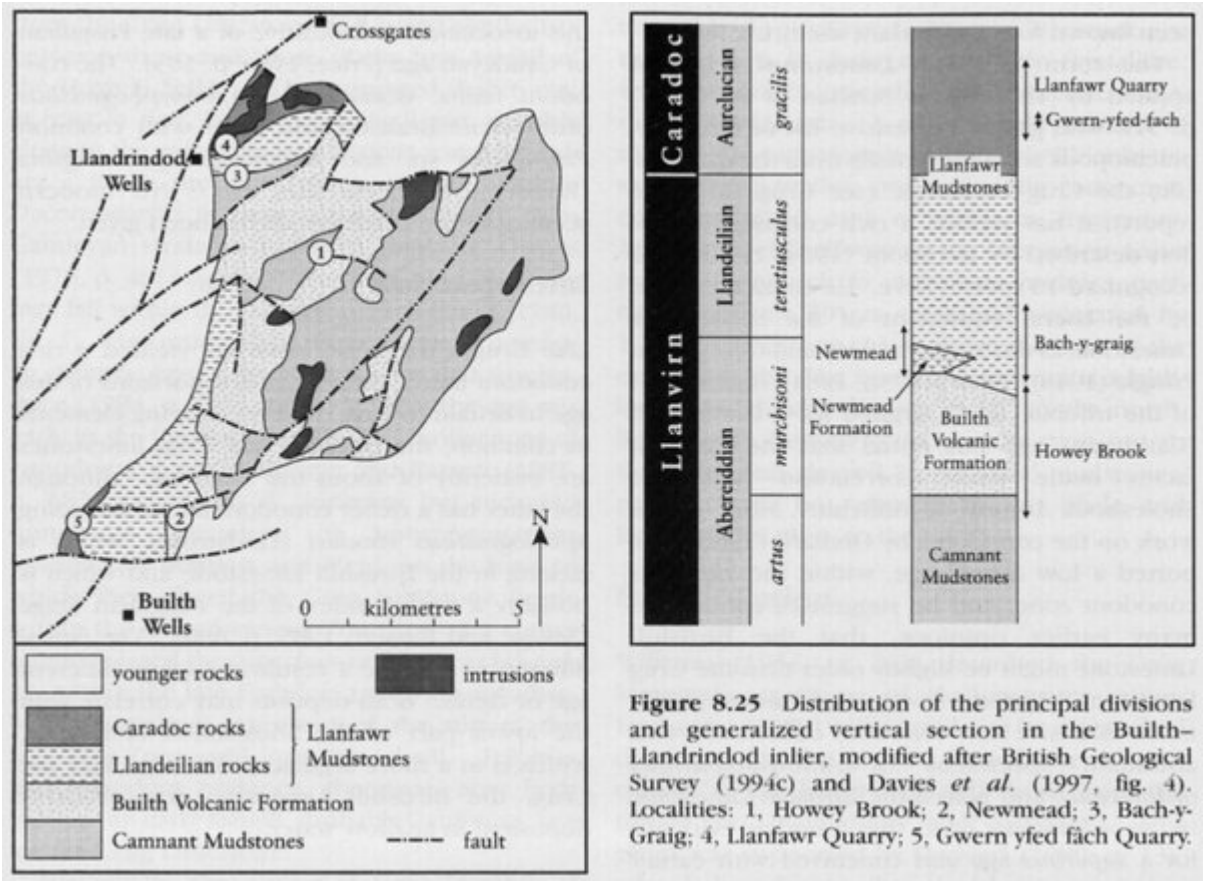


Figure 8.25 Distribution of the principal divisions and generalized vertical section in the Builth–Llandrindod inlier, modified after British Geological Survey (1994c) and Davies *et al.* (1997, fig. 4). Localities: 1, Howey Brook; 2, Newmead; 3, Bach-y-Graig; 4, Llanfawr Quarry; 5, Gwern yfed fâch Quarry.

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