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## Trefawr Track

[SN 8347 3916]–[SN 8398 3960]

### Introduction

This reference section in the Llandovery type area exposes much of the Trefawr Formation, which comprises sandy mudstones with a fauna of graptolites, brachiopods and other fossils. It is a long trackside section extending from 500 m south-west to 150 m north of the farm of Trefawr, to the north of the Crychan Forest in the northern area of the Llandovery district. Geologically, the section is situated almost directly on the axial planar trace of the Cefn-y-gareg Syncline (Cocks *et al.*, 1984, fig. 3; (Figure 3.23)), and traverses the Trefawr Formation from north-east to south-west (Figure 3.25). The Trefawr Formation was named and defined by Cocks *et al.* (1984) to replace the informal unit B (Middle Llandovery) of Jones (1949). These exposures have been opened up since the work of Jones (1949), who recorded that the formation was not well exposed around the nose of the Cefn-y-gareg Syncline.

The Aeronian Stage is named after Cwm-coed-Aeron Farm, 500 m south of the Trefawr track (Cocks *et al.*, 1984), and was proposed to replace the Idwian and Fronian stages of Cocks *et al.* (1970; see report on the network site at Cilgwyn–Ydw Valley). The base of the Aeronian Stage is defined in the Trefawr Track section, within gently dipping mudstones at [SN 8380 3953], 92 m above the base of the Trefawr Formation, at the first appearance of the graptolite *Monograptus austerus sequens*; this was taken by Cocks *et al.* (1984) to be equivalent to the base of the *triangulatus* Biozone. This biozone, or the broader *gregarius* Biozone which has a similarly defined base, is recognized in many areas globally; the incoming of triangulate monograptids and of the genera *Rastrites* and *Petalograptus* is generally indicative of this level (Cocks *et al.*, 1984).

The base of the Aeronian Stage is somewhat higher than the base of its precursor, the Idwian Stage, which was defined at the locality at [SN 757 309] in the Ydw Valley GCR site in the southern Llandovery area. The Aeronian Stage encompasses the majority of the Trefawr Formation plus the Rhydings and Wormwood formations in the Llandovery type area (Cocks *et al.*, 1992).

### Description

The Trefawr Formation is 240 m thick (Cocks *et al.*, 1992), and comprises unlaminated silty mudstones with beds of micaceous sandstone. Strata from the upper part of the underlying Crychan Formation are exposed in a trackside section 160 m north-east of the Trefawr track site, at [SN 8410 3963]; these muddy sandstones yield a brachiopod fauna that includes *Stricklandia lens intermedia* (Siveter *et al.*, 1989). The lowest exposed beds of the Trefawr Formation are generally finer-grained, and there is a general coarsening up-sequence. The beds dip south-westwards at 10–20°.

The Trefawr track section has yielded a large fauna of brachiopods, together with smaller numbers of graptolites, corals, trilobites, ostracods, gastropods, cephalopods, echinoderm fragments and bryozoans (Cocks *et al.*, 1984, table 2; Siveter *et al.*, 1989). The distribution of brachiopods and graptolites across the Rhuddanian–Aeronian boundary is shown in (Figure 3.26). Fossils reported from the lower part of the section, referable to the upper part of the Rhuddanian Stage, include the brachiopods *Eoplectodonta duplicata*, *Plectatrypa tripartita*, *Aegiria garthensis*, *Mendacella mullochensis*, *Leangella scissa*, *Anisopleurella gracilis* and *Skenidioides* sp., and the graptolites *Rhaphidograptus toernquisti*, *Monograptus austerus vulgaris*, *Diplograptus* aff. *elongatus*, cf. *Lagarograptus acinaces*, *Climacograptus* sp. and *Dictyonema corrugatellum*.

Immediately above the base of the Aeronian Stage, *Clorinda undata*, *Plectatrypa tripartita* and *Skenidioides* sp. occur, as well as *Monograptus austerus sequens*. Four metres above the boundary the presence of the *magnus* Biozone is demonstrated by the occurrence of the graptolites *Glyptograptus* (*Pseudoglyptograptus*) *vas*, *Orthograptus insectiformis* and *Glyptograptus tamariscus* cf. *linearis*. Graptolites of the *magnus* Biozone, including *Diplograptus magnus* and similar forms, are present through the section up to beds at [SN 8371 3943], and a change to the *convolutus* Biozone probably

takes place near [SN 8363 3937], although it has not been demonstrated in this particular section (Cocks *et al*, 1984). Brachiopods associated with the *magnus* Biozone graptolites include *Meifodia prima*, *Anisopleurella gracilis*, *Leangella scissa*, *Aegiria garthensis* and *Glossoleptaena? bella*.

The highest exposed beds in the Trefawr Formation [SN 8347 3925] contain *Clorinda undata*, *Plectatrypa tripartita*, *Meifodia prima* and other brachiopods. At the bend in the track, sandy mudstones near the base of the Rhydings Formation contain *Monograptus cf. sedgwickii*, indicative of the *sedgwickii* graptolite biozone (Cocks *et al.*, 1984).

## Interpretation

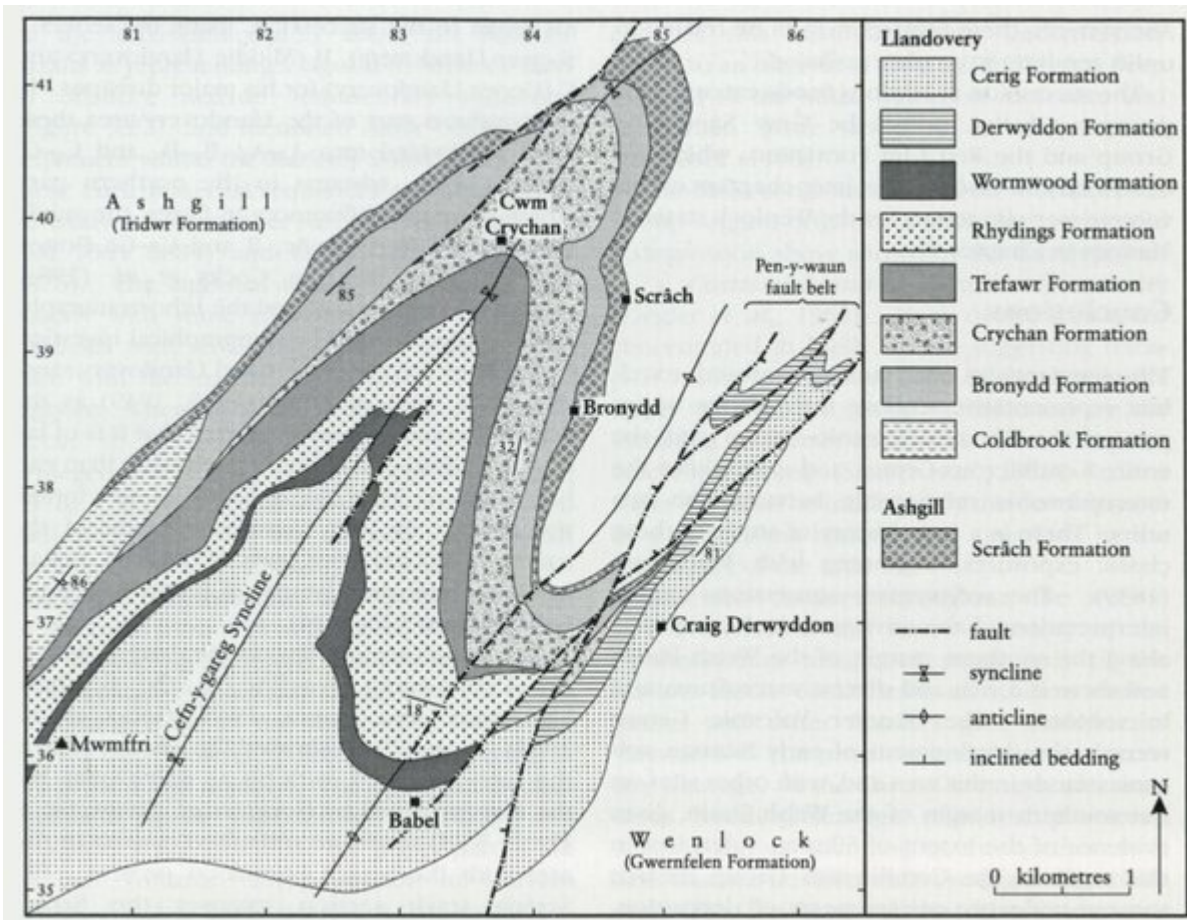
The Trefawr Formation is generally finer-grained than the underlying Crychan Formation, as seen at the GCR site at Scrâch Track. Cocks *et al.* (1984) interpreted the lithology to indicate deposition of the Trefawr Formation in a pro-delta marine setting, but more distal than the Crychan Formation. The sandier beds were probably introduced by storm events. The brachiopod faunas do not fit well into well-defined communities, but the *Meifodia* and *Plectatrypa* assemblages typical of the Trefawr Formation are more diverse than the *Stricklandia* community of the Crychan Formation and this would be consistent with a more offshore marine environment.

In combination with others in the type Llandovery area, this site serves to illustrate the early Silurian stratigraphical and sedimentological succession in this part of the Welsh Basin. Together with the upper beds of the Skomer Volcanic Group at the network site of Marloes Sands, this locality provides evidence of the early Aeronian fauna of the southern part of the basin, and is particularly important for the relative abundance of graptolite specimens that have been recovered.

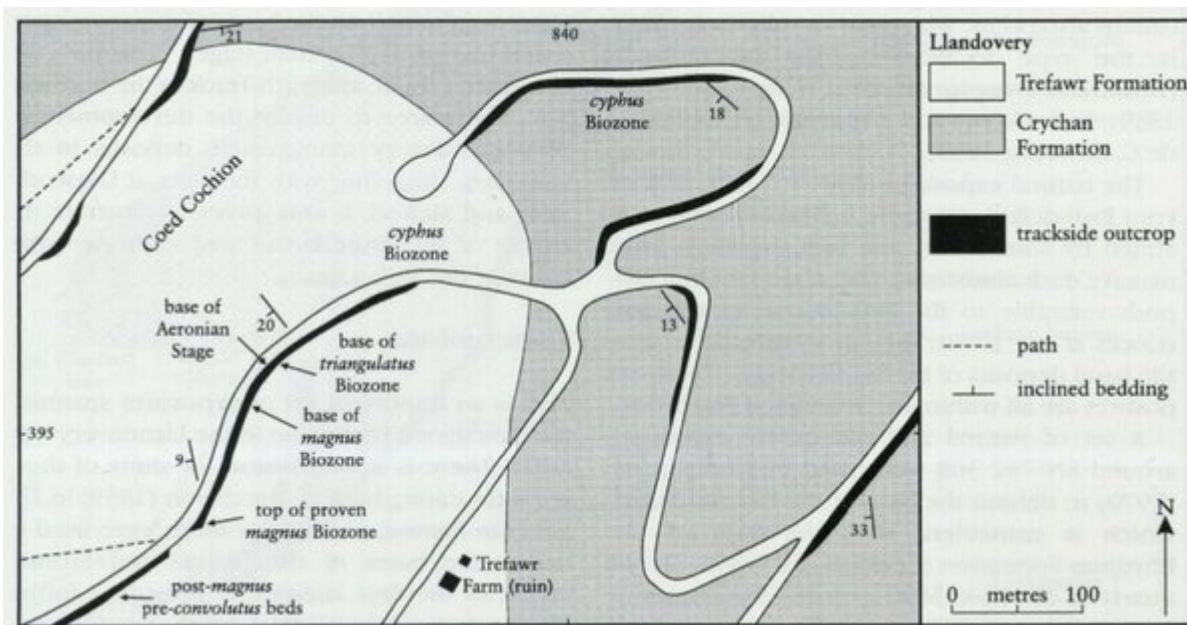
## Conclusions

This is a site of international stratigraphical importance in the Llandovery type area, as it includes the international reference section for the base of the Aeronian Stage of the Llandovery Series. An almost complete section through the Trefawr Formation is displayed, delimited by exposures of the upper beds of the Crychan Formation below and the lower beds of the Rhydings Formation above. Graptolites are more abundant in the Trefawr Formation than in any other part of the Llandovery succession in the type area; these graptolite faunas have allowed recognition of several graptolite biozones and have been used to define the base of the Aeronian Stage. Other fossils, particularly brachiopods, are also common. This site is of major conservation value as an international reference section.

## [References](#)



(Figure 3.23) Geological map of the northern part of the type Llandovery area (after Cocks et al., 1984).



(Figure 3.25) Exposures along and around the Trefawr Track, including the stratotype section for the base of the Aeronian Stage (modified after Cocks et al., 1984).

