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# Scrâch Track

[SN 8415 3942]–[SN 8465 3959]

## Introduction

The Llandovery district has long acted as a national and international reference area for strata now assigned to the lowest series of the Silurian System. The initial work by Murchison (1839) was followed by Geological Survey mapping in 1855–1856, and a major study of the geology was undertaken by Jones (1925, 1949). Jones applied a set of informal lithostratigraphical terms to the succession, using the letters A (Lower Llandovery), B (Middle Llandovery) and C (Upper Llandovery) for his major divisions. In the southern part of the Llandovery area these were subdivided into A<sub>1</sub>–A<sub>4</sub>, B<sub>1</sub>–B<sub>3</sub> and C<sub>1</sub>–C<sub>6</sub> (Jones, 1925), whereas in the northern part, where there are differences in facies, the subdivisions used were Aa–Ac, B and Ca–Cc (Jones, 1949). More recently, Cocks *et al.* (1984) remapped the area, revised the lithostratigraphy and completed new biostratigraphical investigations. They renamed the 'basal Llandovery sandstones' (A<sub>1</sub>, Aa) of Jones (1925, 1949) as the Scrâch Formation, and suggested that it is of latest Ordovician (Hirnantian) age rather than earliest Silurian. They also established new formation names for the Llandovery strata of the southern and northern parts of the area, replacing Jones' informal system of letters and numbers (Figure 3.23), (Figure 3.24).

The Scrâch section lies on the eastern limb of the Cefn-y-gareg Syncline in the northern Llandovery area (Jones, 1949; Cocks *et al.*, 1984). Jones (1949) showed the eastern edge of this limb as faulted, with his Aa unit absent, but the map provided by Cocks *et al.* (1984, fig. 3; (Figure 3.23)) shows an unfaulted contact in this area with the Scrâch Formation present. The Scrâch track section exposes the Scrâch Formation, overlain by the Bronydd and Crychan formations, of Rhuddanian age; the section was logged, as section i2, by Cocks *et al.* (1984, fig 4).

This is an important site as it exposes an almost continuous section of strata across the Ordovician–Silurian boundary, from the top of the Scrâch Formation, through the Bronydd and Crychan formations. The base of the Silurian System is defined outside this area, at Dob's Linn in Scotland, but it is important to identify its position in the type area for the Llandovery Series. According to Cocks *et al.* (1984), the boundary lies at or near the base of the Bronydd Formation, low in which are graptolites of the *acuminatus* Biozone.

## Description

The Scrâch section is situated on the south side of the forestry trackway north to WNW of Scrâch. In this section, the beds dip 33–35° to the west (Jones, 1949; Siveter *et al.*, 1989); the Scrâch Formation is 70 m thick, the Bronydd Formation is 120 m thick, and the Crychan Formation is 250 m thick (Cocks *et al.*, 1984). Site clearance has shown that the Scrâch Formation commences with thick conglomerates, passing upwards into cross-laminated sandstones and cleaved shales. The contact with the Bronydd Formation is complicated by faulting (J. Davies pers. comm.), above which the formation is dominated by mudstones, with interbedded sandstones increasing upwards. The Crychan Formation consists of massive, bioturbated sandy mudstones and muddy sandstones, commonly with coarser bases; occasional thin shelly sandstones occur. The top of the Crychan Formation is not seen in this section.

Cocks *et al.* (1984) recorded a *Hirnantia* fauna in the Scrâch Formation, demonstrating a Hirnantian age. Close to the base of the Bronydd Formation in the Scrâch section, the graptolite *Climacograptus normalis* occurs, indicating the *perscultus* or *acuminatus* biozone (Rickards in Cocks *et al.*, 1984, p. 144). Other graptolites from higher in the formation include *C. cf. normalis* and *C. rectangularis*, assignable approximately to the *atavus* and *acinaces* biozones (Cocks *et al.*, 1984). The Crychan Formation has yielded several graptolites, including *Rhaphidograptus toernquisti*, and a locality in the very top of the formation beyond the Scrâch section at [SN 8397 3907] has produced *Atavograptus? strachani* and some possible triangulate monograptid thecae; thecae of this type first appear in the *cyphus* Biozone (Cocks *et al.*, 1984). Cocks *et al.* (1984, table 1) provided full lists of brachiopods and other fossils in the Bronydd and Crychan formations. Brachiopods are relatively common, with *Eoplectodonta duplicata*, *Leangella scissa*, *Mendacella mullochensis* (= '*Resserella*' sp.) and *Dolerorthis sowerbyana* present throughout; the Bronydd Formation also includes

*Hyattidina? angustifrons* and *Skenidioides* sp., with *Clorinda undata*, *Cryptothyrella crassa* and *Meifodia prima prima* in the upper beds; the Crychan Formation also has *Stricklandia lens lens* and diverse less common forms. Among the other fossils, pelmatozoan columnals and bryozoans are most common, but occasional corals, trilobites and gastropods also occur.

## Interpretation

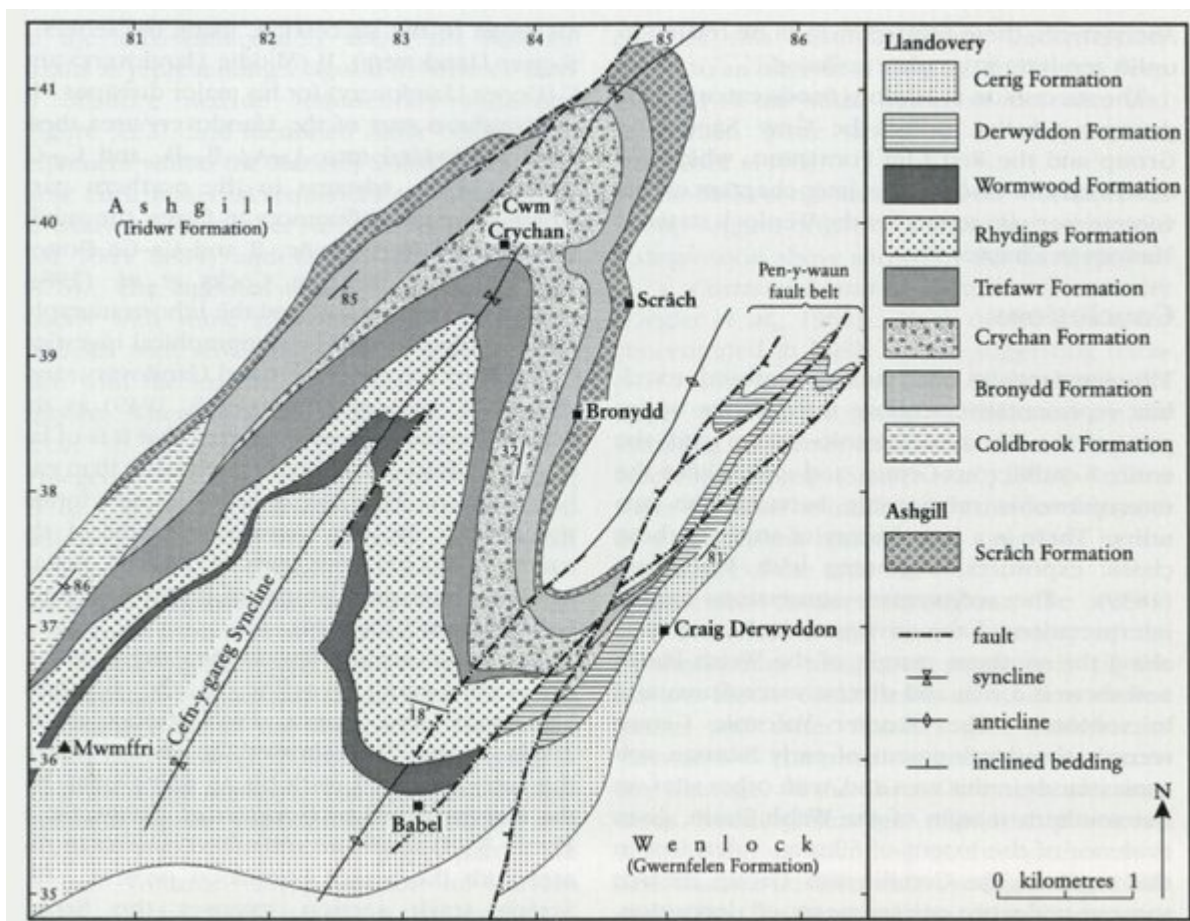
Environmental interpretations of the sedimentological features were given by Cocks *et al.* (1984), who considered the flaser-bedded sands of the Scrâch Formation to be characteristic of intertidal or shallow subtidal conditions, with coarser sand bodies representing tidal bars or channels. The environment is shallower than that represented by underlying Ordovician sediments and probably reflects late Ordovician glacio-eustatic lowering of sea level. Subsequent deepening is indicated by the marine shelf mudstones of the Bronydd Formation, in which the discrete sand beds may represent occasional storm events; the general coarsening upwards in this formation indicates prograding sedimentation, perhaps pro-deltaic. The further coarsening in the Crychan Formation is probably the result of deposition on a more proximal part of a pro-delta lobe, although, as the fauna shows, this is still in a fully marine regime. The diverse brachiopods, including *S. lens lens*, show that a *Stricklandia* benthic community was developed. Palaeocurrent directions indicate a sediment source from the south-east, with evidence for storm events from winnowed sand beds.

This is a key site in the type Llandovery area that demonstrates the environmental development in the early Silurian of this part of the Welsh Basin and provides a representative section through the Scrâch, Bronydd and Crychan formations. Together with the local sites in the Ydw Valley and the sites at Gasworks Lane and Meifod, it provides evidence of the marine fauna that succeeded the characteristic late Ordovician *Hirnantia* fauna in the Welsh Basin.

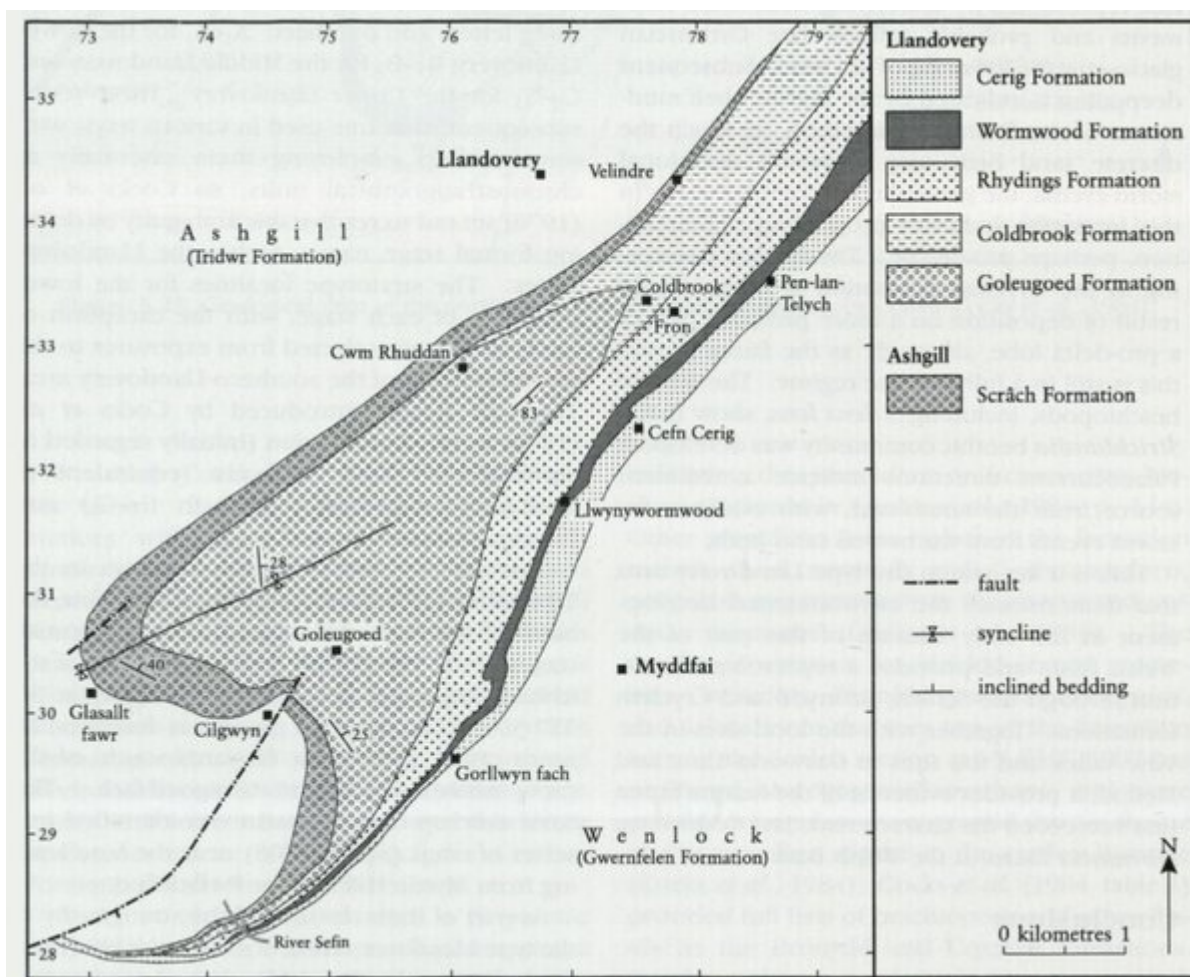
## Conclusions

These trackside exposures are of major importance as they display the local base of the Silurian System in the international type area for the Llandovery Series. They also provide representative sections in the Scrâch, Bronydd and Crychan formations, and present lithological evidence for the development of early Silurian marine environments in this part of the Welsh Basin. The strata contain characteristic latest Ordovician and earliest Silurian faunas. The international importance of this site as a reference section in the Llandovery type area renders it of high conservation value.

## [References](#)



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



(Figure 3.24) Geological map of the southern part of the type Llandovery area (after Cocks et al., 1984).