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# Crûg Farm

[SN 627 231]

## Introduction

Crûg Farm is of regional and palaeontological importance, being the type locality of the Crûg Limestone, a conodont-rich limestone facies in the Ordovician of Wales. It is the type locality for certain trilobite and conodont species.

A small outcrop of fossiliferous shelly limestone at Crûg Farm, 0.6 km NNW of Llandeilo (Figure 8.17), is the type locality for the Crûg Limestone. This limestone was reported by Murchison (1839), who described the rocks as being the 'oldest calcareous beds' of his 'Llandeilo Flags Formation'. Phillips (1848, p. 324) described it as a limestone with large trilobites and also attributed it to the Llandeilo Series. Salter (1853) initially followed this view in describing *Phacops* (now *Toxochasmops*) *amphora*, but later (Salter 1864–1883, p. 42) described it as 'Caradoc Limestone'. Cantrill (in Strahan *et al.*, 1907, p. 31) included it within the 'Bala Limestone'.

The Crûg Limestone was named by Williams (1953, p. 194), who, on the basis of the shelly fauna, regarded it as being referable to the Longvillian to Marshbrookian stages of the Caradoc. He suggested that it was probably equivalent to the upper Cheney Longville Flags of Shropshire and the Robeston Wathen Limestone of Pembrokeshire. Following Williams' (1953) description, which remains the only detailed account, there has been a good deal of palaeontological debate on the age of the limestone, centred particularly upon the rich conodont fauna that was first described from here by Lindstrom (1959); he followed Williams' age assessment. A similar age, within the *Amorphognathus superbus* conodont Zone, was supported by Bergström (1964, 1971) on the basis of further studies on the conodont fauna. Orchard (1980) made new conodont collections from the Crûg Limestone and noted similarities between these and those of the low Ashgill of the Howgill Fells, and he suggested that it may, at least in part, be of early Ashgill age, possibly close to the *superbus*–*ordovicianus* zonal boundary. From the occurrence of the trilobite *Decoroproetus piriceps* (Ingham), known from Cautleyan strata in northern England, Owens (1973, p. 48) suggested that the Crûg Limestone may fall within the Cautleyan; McNamara (1980, fig. 2), who redescribed *Toxochasmops amphora* (Salter), gave a similar range for that species. Price (1984, p. 103) concluded that the age was early in the Cautleyan Stage. New collections of conodonts made by Savage and Bassett (1985, p. 683) lacked any *A. superbus* but included numerous specimens of *Amorphognathus ordovicianus* Branson and Mehl, on the basis of which they placed the Crûg Limestone firmly within the *A. ordovicianus* Zone and as a consequence placed the *superbus*–*ordovicianus* boundary within the late Caradoc, removing an otherwise anomalous extension of the top of the *superbus* Zone well into the Ashgill. Trilobite and conodont evidence, therefore, now both indicate an early Ashgill, probably Cautleyan, age for the Crûg Limestone.

Historically, the quarry at Crûg Farm is of some interest in that it is very likely the type locality for the trilobite *Atractopyge verrucosa* (Dalman) (Figure 8.23)e; the type specimen of this species is almost certainly the original of one of Lhwyd's (1699a) figures (see Dean, 1974, p. 97), which is one of the earliest illustrations of a trilobite ever published; his woodcut is clearly recognizable as a mirror image of the type specimen at Oxford University Museum (Owens, 1984, p. 4). The same specimen was illustrated by Brongniart (1822, pl. 4, fig. 11). Crûg is the type locality for several conodonts, including *Aphelognathus rbodesi* Lindstrom and *Ozarkodina? pseudofissilis* (Lindstrom).

## Description

The exposures at Crûg Farm are generally poor and disjointed, and there is no continuous section through the sequence. The largest exposure is in a disused quarry at the eastern end of the field immediately adjacent to the farmhouse. The remainder of the outcrop is seen poorly exposed in a series of hummocks in the same field and along the northern bank of a disused track running along the southern boundary of the field. Approximately 20 m of limestone are exposed. It is dark-grey, coarsely crystalline, with remarkably little siliciclastic material, and is richly fossiliferous. A considerable amount of the calcium carbonate is composed of bioclastic, sand-sized particles, predominantly comminuted brachiopod and echinoderm fragments. Approximately half-way up the succession occur two horizons rich in phosphate nodules,

each horizon about 20 cm thick and separated by 1.8 m of limestone, 13 m above the base of the exposed beds. The limestone outcrop is a fault-bounded lenticle, dipping at 60° to the north. Shales with *Nemagraptus gracilis* crop out to the south and cleaved 'upper Bala' mudstones, presumed to be referable to the Slade and Redhill Formation, to the north.

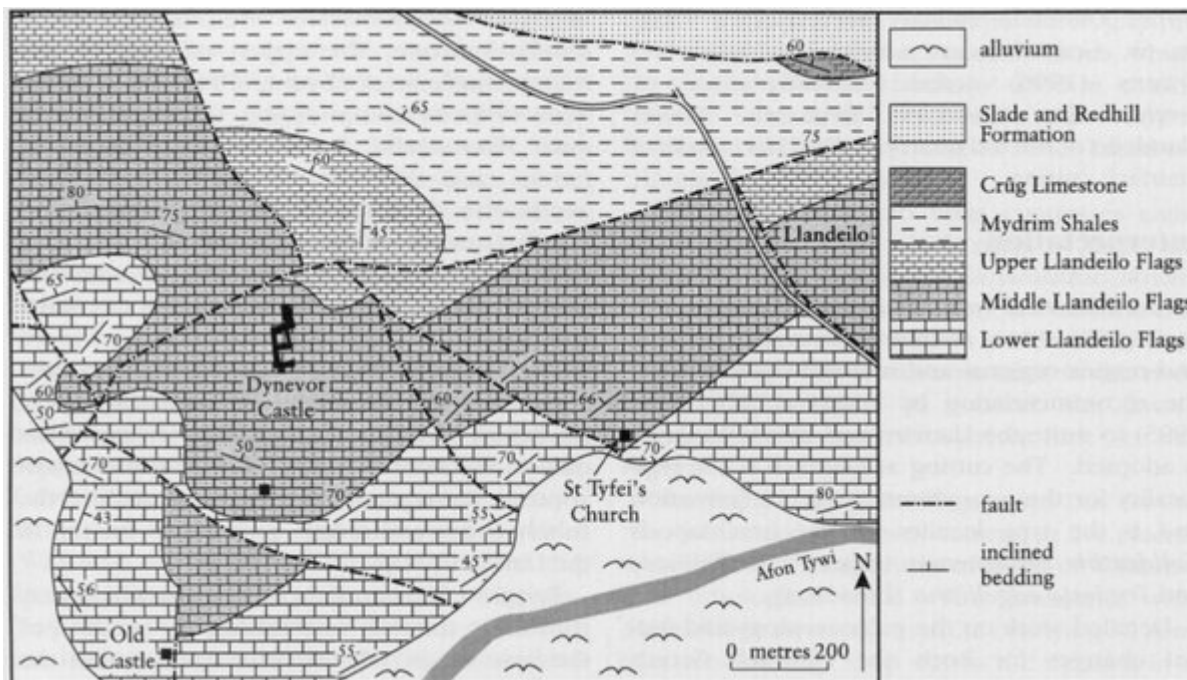
## Interpretation

Williams (1953, p. 203) described the Crûg Limestone as being of shallow-water origin. Lindstrom (1959) considered it to be a reworked deposit, with the greatest abundance of conodonts in the lower part and those from the upper part fragmentary and corroded. This claim was supported by Orchard (1980, p. 13), who believed that the conodont association reflected a degree of reworking and condensation. Both the conodont and trilobite faunas support an early Ashgill age (probably Cautleyan Stage), and they show more differences than similarities to the older (Caradoc) faunas, with which the Crûg Limestone had formerly been correlated, as discussed above.

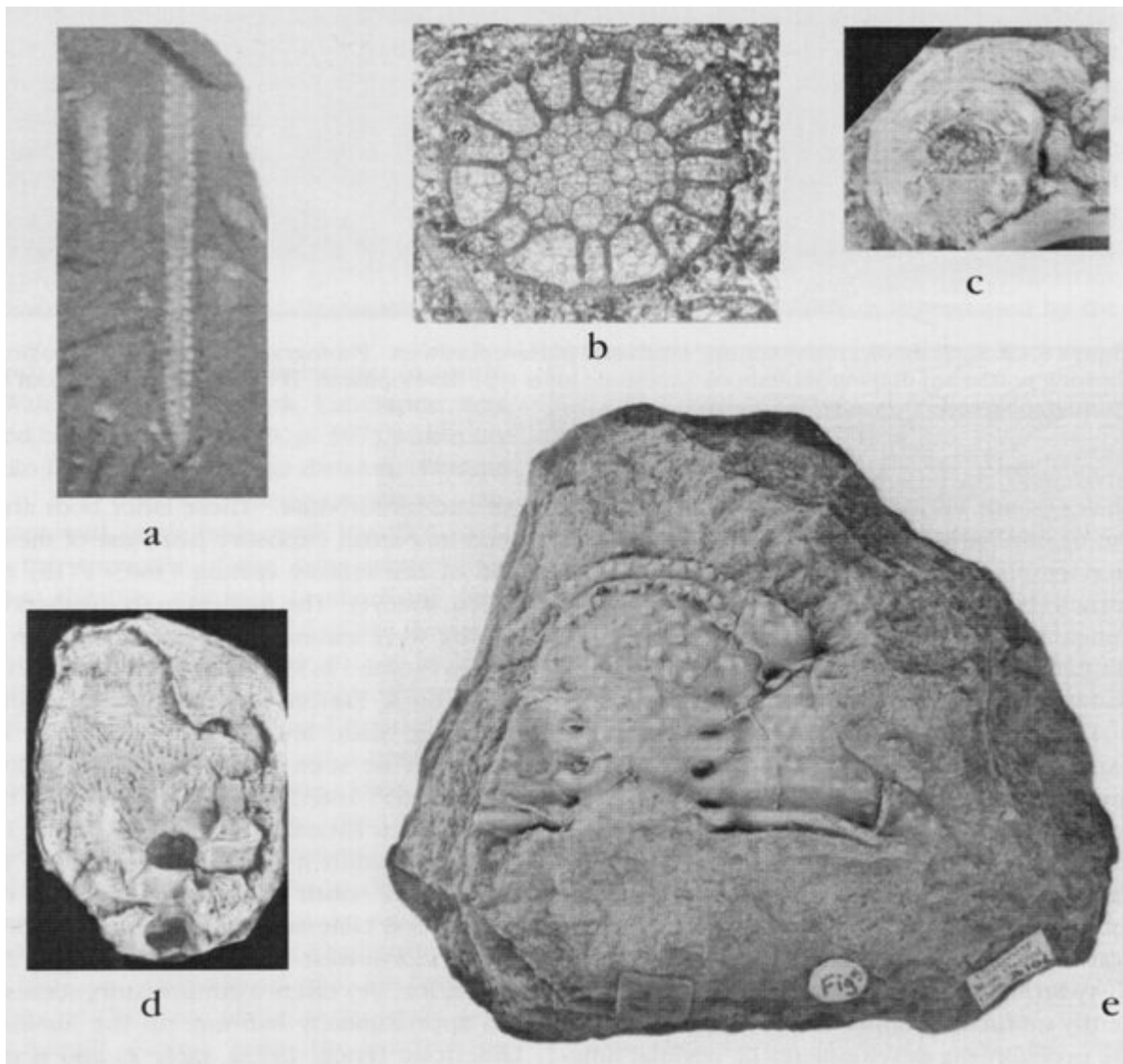
## Conclusions

Crûg Farm is the only place where the Crûg Limestone, a unique conodont-rich limestone facies in the Ordovician of Wales, is exposed. It is the type locality for certain species of trilobites and conodonts.

## References



(Figure 8.17) Geological map of Dynevor Park, after Williams (1953).



(Figure 8.23) (a) *Normalograptus* sp., x 3, a typical graptolite that proliferates in the upper beds of the Mydrim Shales at Pengawse Hill. (b) Transverse section of the bryozoan *Kuckersella borealis* (Bassler), x30, Slade and Redhill Beds, Pengawse Hill. (c) *Eucystis pentax* Paul, x4, Shoeshook Limestone, Shoeshook. (d) *Arhegocystis stellulifera* (Salter), x2, Shoeshook Limestone, Shoeshook. (e) *Atractopyge verrucosa* (Coalman), holotype cranium, x1.5, from the Crûg Limestone, Crûg.