Afon Seiont

[SH 4788 6247]–[SH 4809 6169] and [SH 483 617]

Introduction

The Afon Seiont exposes an important local section through the upper part of the Arenig Series, furnishing some of the best palaeontological evidence for the Fennian and lower Llanvirn strata in the Nant Ffrancon 'Formation' (now Subgroup), whose outcrop extends north-east to Bangor and is widespread in Snowdonia.

The Arenig age of rocks in this section was recognized by Hicks (in Marr, 1876, p. 126) and by Ramsay (1881, p. 197). Elles (1904, pp. 200–203), who identified on the basis of graptolite faunas the presence of the *extensus, hirundo* and *bifidus* zones, was of the opinion that most of the. Arenig was represented, suggesting that it is one of the few continuous sections through this interval in Britain. However, Beckly (1987) re-collected these exposures and demonstrated that only the upper part of the Arenig (Fennian Stage) and lower part of the Llanvirn (Abereiddian Stage) can be proved. Although the Arenig–Llanvirn boundary itself crops out here, it is poorly exposed, and is better exposed on the shore at Penrhyn Park, Bangor [SH 6035 7304] (see Fortey *et al.,* 1990, p. 126).

Afon Seiont is the type locality for the trilobite *Aeglina hughesii* Hicks (in Marr, 1876) (a junior synonym of *Pricyclopyge binodosa*) and for the phyllocarid crustacean *Caryocaris marrii* (a junior synonym of *C. wrightii* Salter). The faunas here are mixed graptolitic–shelly facies, and afford correlation between South Wales and the Lake District.

Description

The section is described from north to south, up sequence (Figure 9.10). The oldest Arenig strata are seen just south of the quay at [SH 4788 6247], near the core of an anticline which, on the basis of Elles' (1904, p. 201) map, runs approximately NE–SW through the quay itself. A short distance to the north, near the castle, the Arenig is faulted against the Monian Supergroup (Precambrian). Much of the section in exposures to the south of the quay on the left bank as far as [SH 4799 6183], over a distance of some 800 m, exposes grey micaceous siltstone with discontinuous fine sandstone laminae, dipping south-east variously at 25–65°. Fortey *et al.* (1990, fig. 3, p. 126) measured some 275 m of strata here. The northernmost exposures, south of the quay, have yielded the trilobite *Dindymene* sp. at [SH 4782 6240], the trilobite *Eoharpes* sp. with a specimen of the graptolite *Pseudisograptus manubriatus koi* Cooper and Ni at [SH 4801 6233], and a trilobite *Selenopeltis* sp. at [SH 4804 6219]. *Pricyclopyge binodosa eurycephala* Fortey and Owens, which (along with deformed extensiform graptolites) dominates the fauna, ranges between the last two points. Elles (1904, fig. 1, p. 201) placed all this part of the section in the *D. extensus* Zone.

The highest part of the Arenig is exposed in outcrops to the south, alongside the path of an old tramway. Here, the topmost 75 m is much sandier and is poorly fossiliferous but has yielded biserial graptolites, including *Undulograptus austrodentatus* (Harris and Keble) at [SH 4800 6180]. Bluish-black siltstones overlying these sandier beds are characterized by abundant pendent ('tuning fork') graptolites, indicative of the *D. artus* Zone. The junction is poorly exposed at 4803 6181, and the lower Llanvirn crops out over a distance of some 150 m south-east of this point. Besides the graptolites, some of which are preserved in full relief (Jenkins, 1979, unpublished), trilobites (e.g. *Placoparia* sp. and *Pricyclopyge binodosa binodosa* Salter), phyllocarids and lingulate brachiopods occur. This stretch probably includes the type localities for *Aeglina hughesii* and *Caryocaris marrii.*

On the opposite bank of the Seiont, near the gates to Eryri Hospital, blue-black cleaved shales, commonly iron-stained, are exposed to the north of a dolerite intrusion around [SH 483 617] and have yielded graptolites including abundant pendents, together with *Amplexograptus confertus* (Lapworth), *Eoglyptograptus dentatus* (Brongniart) and *Pseudoclimacograptus scharenbergi* (Lapworth). Jenkins (1979) collected 'forms close to *Didymograptus murchisoni* (Beck)' from this locality and therefore considered it to lie low in the *murchisoni* Zone.

Interpretation

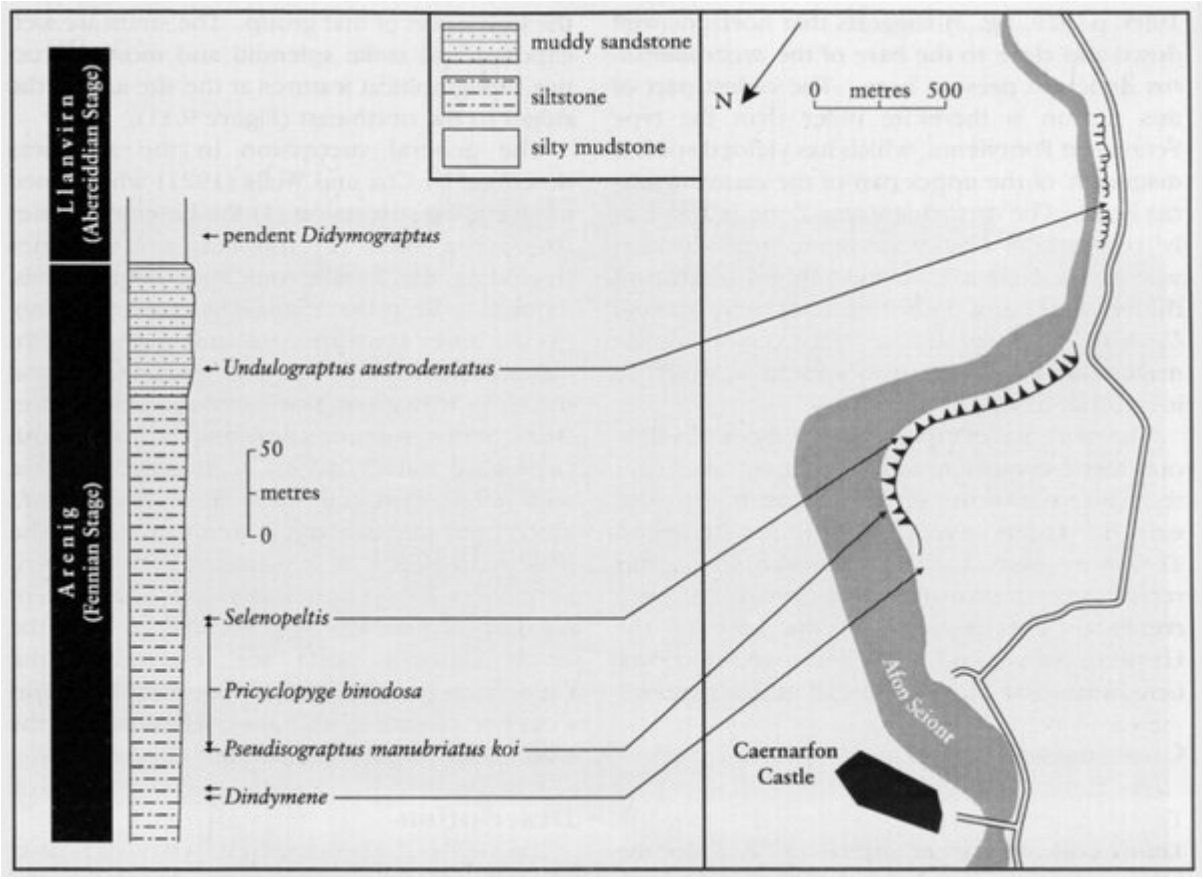
Although Beckly's (1987) work has shown that less of the Arenig is present here than was formerly supposed, the locality does afford a useful section through the late Arenig and early Llanvirn, and confirms the presence in North Wales of the general sequence described in South Wales by Fortey and Owens (1987). Perhaps most significant is the presence of the graptolite *Pseudisograptus manubriatus koi,* which is widespread globally, and in Australia is restricted to the Yapeenian Stage (Fortey *et al.,* 1990, p. 127). The presence of this species immediately below and in the basal part of the *U. austrodentatus* Zone (Mitchell and Maletz, 1995, p. 319, fig. 2) suggests that horizons well down and close to the base of the *austrodentatus* Zone are present here. The oldest part of this section is therefore older than the type Fennian at Pontyfenni, which has yielded species diagnostic of the upper part of the *austrodentatus* Zone. The *austrodentatus* Zone is a globally recognized chronostratigraphical division with a base defined in China (Webby, 1998), and the occurrence of both *P. manubriatus koi* and *U. austrodentatus* in the Afon Seiont section makes this the best British section at which to identify its base.

The presence of cyclopygid trilobites throughout, together with an isograptid graptolite near the basal part of the section, suggests the presence of a deep-water, offshore environment. The sandy interval at the top of the Arenig may represent a regressive phase, followed by a return to deeper water at the base of the Llanvirn, corresponding to a transgression over Gondwana that was widespread at this time.

Conclusions

The Afon Seiont section is important nationally. The faunas allow identification in Britain of the internationally recognized *Undulograptus austrodentatus* Zone, and they include both trilobites and graptolites that aid correlation between the upper Arenig succession in South Wales with that in the English Lake District. Regionally the section provides biostratigraphi-cal evidence for the age of the lower part of the Nant Ffrancon Subgroup, which, though thick and widespread, rarely reveals fossiliferous beds in such good stratigraphical succession.

References



(Figure 9.10) Stratigraphical succession showing the Arenig to Llanvirn succession along Afon Seiont, after Fortey et al. (1990, fig. 3).