
Rumney River

[ST 209 789]

Introduction

The River Rumney flows in an overall north to south direction through the north-east outskirts of Cardiff and into the mouth of the Severn. As it does so it cuts through Wenlock, Ludlow and Pridoli age sediments, the Wenlock and Ludlow strata forming part of the main Silurian inlier of this part of south Wales (Figure 4.19).

As with the other Cardiff sites discussed herein that have Wenlock age strata (Penylan and Rumney quarries), particularly important references relating to the detailed litho- and biostratigraphy of the present site are those of Sollas (1879) and Waters and Lawrence (1987). Sollas was the first to give a detailed, broadly accurate account of the Cardiff Silurian, for which Waters and Lawrence have lately presented a comprehensive revision. Strahan and Cantrill (1902, 1912) described the Rumney River section but their account (like their descriptions of Penylan and Rumney quarries) essentially mirrored that of Sollas. The palaeontological work of Bassett (1969) on the Cardiff Silurian was significant, as he determined that the oldest rocks in the inlier (at Penylan) were of *Wenlock*, not *Llandovery*, age. He subsequently (1974a) gave a synthesis of the Wenlock stratigraphy of the district, though did not comment specifically on the Rumney River locality.

This site exposes Cae Castell Formation, Wenlock age, strata; the site boundary also takes in beds of the Hill Gardens and Llanedeyrn formations of the Cardiff Group, which are all Ludlow in age (Figure 4.20) and (Figure 4.21).

Description

Discontinuous exposures of the three Wenlock and Ludlow formations noted above occur on the east bank of the River Rumney, along which the rocks young north-eastwards. The section stands as one of the type localities for the Cae Castell Formation and also as one for the Hill Gardens Formation. Waters and Lawrence (1987), who established these lithostratigraphical units, provided the following log:

Stratigraphy/lithology/fauna	Thickness (m)
LUDLOW SERIES:	
Cardiff Group:	
<i>Llanedeyrn Formation:</i>	
At NGR [ST 2107 7919]: Trenching shows sediments of Llanedeyrn Formation at about the level of Eastern Avenue Member–Chapel Wood Member boundary in faulted contact with basal sandstone of Raglan Mudstone, flidoli Series.	
At NGR [ST 2106 7918]: Exposure high in river bank, has green-grey blocky weathering siltstones and mudstones, and a few brownish green weathering, thin, fine-grained sandstones, at about Eastern Avenue Member–Chapel Wood Member boundary. The (lowest Ludfordian) fauna includes <i>Favosites</i> sp., bryozoans, <i>Aegiria grayi</i> , <i>Atrypa reticularis</i> , <i>Coolinia pecten</i> , <i>Dayia navicula</i> , <i>Howellella elegans</i> , <i>Isorthis clivosa</i> , <i>I. orbicularis</i> , <i>Leptostrophia filosa</i> , <i>Microsphaeridiorhynchus nucula</i> , <i>Orbiculoidea</i> sp., <i>Protochonetes ludloviensis</i> , <i>Salopina lunata</i> , <i>Shagamella minor</i> , <i>Sphaerirhynchia wilsoni</i> , <i>Kionoceras angulatum</i> , <i>Orthoceras ibex</i> and <i>Dalmanites</i> sp..	0.45
<i>Eastern Avenue Member:</i>	

At) NGR [ST 2105 7917]: Small pit high in river bank, with pale greyish-green, very silty, tough, calcareous, micaceous mudstones, locally reddened along joints and forming blocky beds up to 0.13 m thick, with 'nodules' and thin beds of silty green-grey shelly crinoidal limestone with corals. The (late Gorstian) fauna includes *Amphistrophia funiculata*, *Atrypa reticularis*, *Gypidula* sp., *Howellella* cf. *subinsignis*, *Isorthis* 2.5
orbicularis, *Leptaena depressa*, *Leptostrophia filosa*, *Lingula* ? sp., *Mesopholidostrophia lepisma*,
Microsphaeridiorhynchus nucula, *Protochonetes ludloviensis*, *Shaleria* aff. *ornatella*, *Sphaerirhynchia wilsoni*, *Ptychopteria* sp., *Bembexia lloydii*, *Dalmanites?* sp. and a proetid.

At NGR [ST 2105 7915]: Many elements of the above fauna as well as bryozoans, *C. implicatus*, *H. elegans*, *I. clivosa*, *Salopina lunata* and *Calymene* sp..

Hill Gardens Formation:

At NGR [ST 2102 7909]: Siltstone; olive-green, laminated, locally cross-laminated, beds to 0.1 m; abundant thin interbeds of buff-weathered, shaly silty mudstone; subordinate green-grey, patchily purple stained, laminated or cross-laminated, fine-grained sandstones in beds to 0.2 m; c. 70.0
in top third many sandstones have impure limestones weathering to rottenstones at their bases; sparse, thin, silty, shelly crinoidal limestone; scattered brachiopods and bivalves; burrows, commonest in the mudstones; *A. reticularis* and *G. galeata* common in lower part.

Sandstone; purplish-grey and green mottled, fine-grained, hummocky cross stratification, planar-lamination and cross-lamination present, calcareous; in 5 prominent beds up to 0.3 m thick, some shelly and crinoidal at base; 1.85
interbeds of olive-green silty shaly mudstone with scattered thin siltstone and very fine grained sandstones.

Ty Mawr Ironstone; red; oolitic, argillaceous, ferruginous limestone; rich shelly fauna including *Catenipora?* sp., 0.6
Syringopora? sp., *A. reticularis*, *G. galeata*, *Sphaerirhynchia wilsoni*, *S. euglypha*, crinoid colum-nals.

Mudstone; olive-green, very silty, burrowed, abundant beds of siltstone and sandstone; sandstones are grey-green, buff weathered, calcareous, fine grained, laminated, some 8.24
cross-laminated; scattered disrupted silty shelly crinoidal limestone beds.

WENLOCK SERIES:

Cae Castell Formation:

At NGR [ST 2096 7892]–[ST 2101 7898]: Sandstone; green-grey, buff weathering, fine- and medium-grained, locally coarse, variably calcareous; finely and coarsely interlayered with grey silty mudstone; parallel- and c. 23.0
cross-lamination, lenticular and flaser bedding common; abundant, scattered plant-like debris; scattered brachiopods, crinoid debris and bivalves; burrows. Some gaps in exposure.

Additionally, Silurian rocks from the Rumney River section, which must be lower in the Wenlock than those given in the above log, were recorded by Sollas (1879). They were observed by him at low tide, beginning from a point just upstream from Rumney Bridge. Included in his description were mudstones and sandstones, which he correlated with those at Penylan Quarry; these were succeeded by the Rhymney Grit. However there is no recent record of these rocks being exposed here at the present day. The sporomorphs described recently by Burgess and Richardson (1995) from the Cae Castell Formation (and also from the Hill Gardens and Llanedeyrn formations) of the Rumney River section, were from stratigraphically above the Rhymney Grit. From the Ludlow part of the section, Sollas (1879) established three gastropod and one bivalve species: *Cyclonema turbinatum*, *C. simplex*, *Murchisonia corpulenta* and *Leda (?) ambigua*.

Interpretation

Since the time of Sollas (1879) until recently, the precise age of parts of the Silurian succession in the Rumney River section was uncertain, and in particular the position there of the Wenlock–Ludlow boundary. Sollas believed that the 0.6 m thick Ty Mawr Ironstone (see log) together with the 4.26 m of strata above it and 8.53 m of strata below it (his Cae Castell sequence) were the equivalent of the 'Wenlock Limestone', thus making these beds latest Wenlock in age. Bassett (1974a) also thought that this red, calcareous, crinoidal ironstone probably correlated with part of the 'Wenlock Limestone', a view tentatively followed by Waters and White (1980) in their initial, summary log of the Rumney Borehole. Subsequently, Waters and Lawrence (1987) reported that acritarch evidence from the borehole showed that that part of the Hill Gardens Formation below the ironstone is of early Gorstian, Ludlow age and that the Wenlock–Ludlow series boundary should be taken at the junction of this formation and the Cae Castell Formation below it. Graptolites from the lower part of the Hill Gardens Formation of the borehole support this correlation.

That part of the Cae Castell Formation such as is detailed in the above log, that is, higher in the formation than the Rhymney Grit and excluding the Newport Road Member, was deposited in a shallow inner-shelf environment, mainly above storm-wave base and sometimes above normal-wave base; it has a restricted fauna. The Rhymney Grit is thought to be a subtidal sand bar whilst the Newport Road Member (recognized in the middle of the formation in the Rumney Borehole) represents a short, more open marine phase. The base of the Hill Gardens Formation marks a transgressive event accompanied by a high diversity fauna (brachiopods, molluscs, trilobites, bryozoans, crinoids) and a return to mid-shelf conditions similar to those in which the mid-Wenlock Pen-y-Lan Mudstone was deposited. Regression towards the top of the Cardiff Group heralds the arrival of the red mudstones, calcretes and dominantly fluvial sandstones of the Pŷdoli Raglan Mudstone Formation.

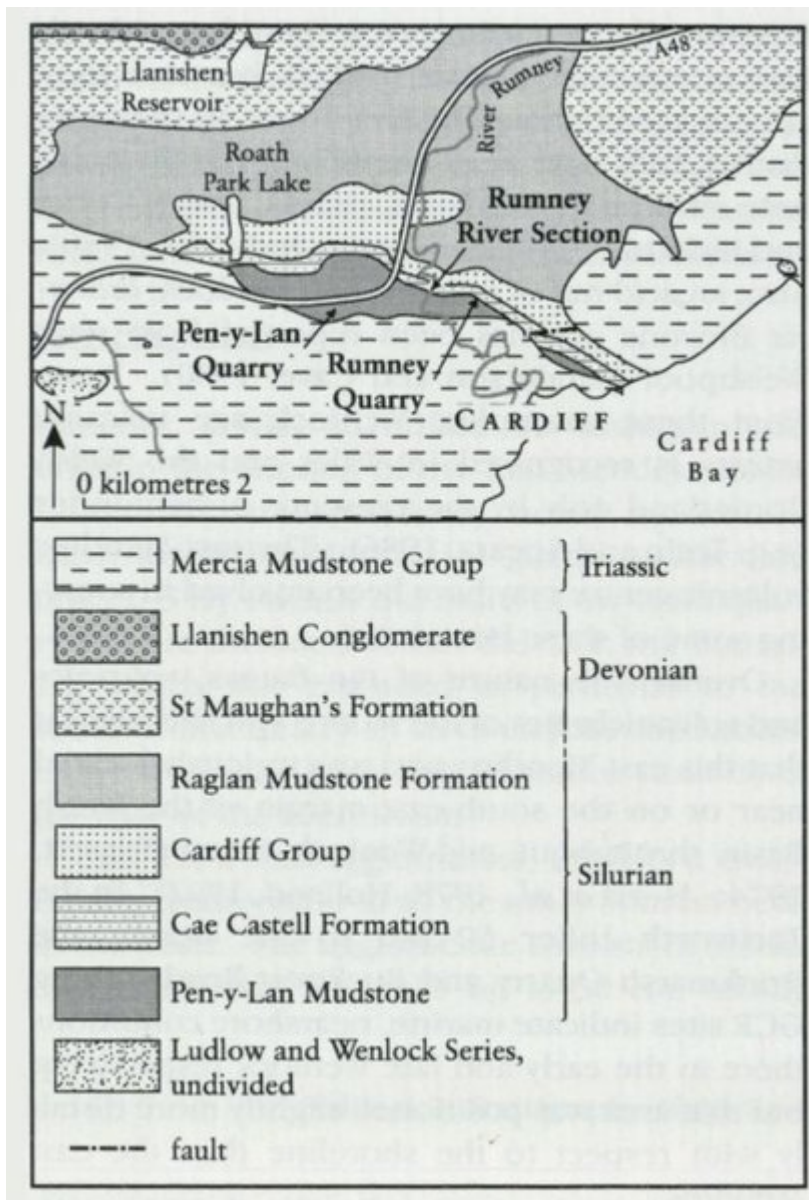
Wenlock strata exposed in this Rumney River section follow on stratigraphically from those in the nearby Rumney Quarry site, where the lower part of the Cae Castell Formation (Rhymney Grit and slightly higher beds) crops out.

Conclusions

This site complements stratigraphically the other two listed sites of Wenlock age in the Silurian inlier of the Cardiff district, Penylan and Rumney quarries, to provide comprehensive coverage for this series in the south Wales region. Rumney River is the only locality in this area where the higher beds of the Wenlock Cae Castell Formation are exposed at the surface. The site is also of merit in containing the Wenlock–Ludlow boundary horizon, together with succeeding beds of the Ludlow Series up to lowest Ludfordian strata. Much of the late Homeric to lower Gorstian part of the section, which reflects a regressive then transgressive history, benefits from fairly continuous exposure.

The Ludlow here is the type locality for several species of mollusc.

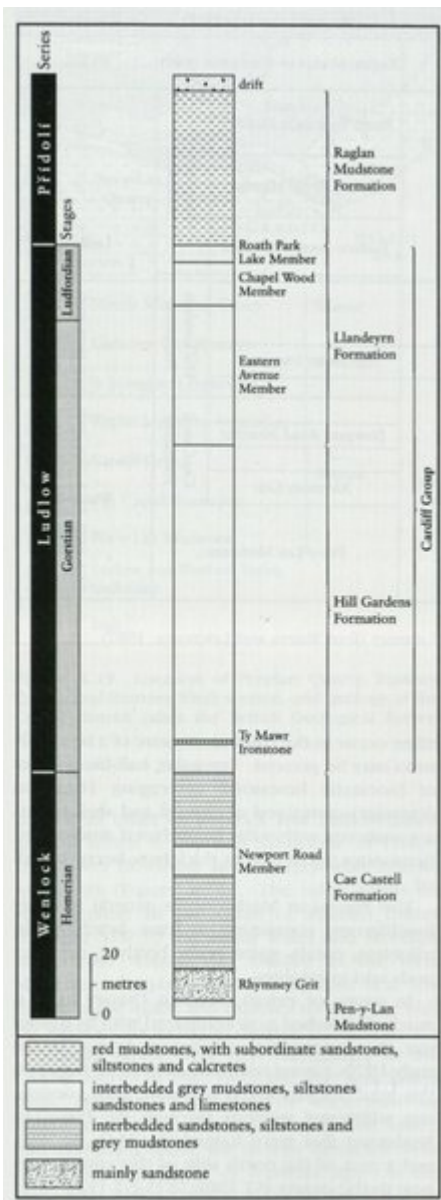
[References](#)



(Figure 4.19) Location of Penylan Quarry, Rumney Quarry and Rumney River section, and geology of the Cardiff district (after the British Geological Survey, 1986).

Sollas (1879)	Strahan and Cantrill (1902)	Waters and Lawrence (1987)		Series	
Lower Old Red Sandstone (<i>pars</i>)	Red Marls (<i>pars</i>)	Raglan Mudstone Formation (<i>pars</i>)		Pŷdoli	
alternating mudstones, sandstones and shales	Ludlow Beds	Roath Park Lake Member	Llanedeyrn Formation	Ludlow	
		Chapel Wood Member			
		Eastern Avenue Member			
			Hill Gardens Formation		
Wenlock Limestone	Wenlock Limestone	Ty Mawr Ironstone			
alternating mudstones and sandstones		Wenlock Beds	Newport Road Member	Cae Castell Formation	Wenlock
			Rhymney Grit		
Rhymney Grit	Rhymney Grit				
mudstones and sandstones			Pen-y-Lan Mudstone		

(Figure 4.20) Silurian stratigraphy of the Cardiff district (from Waters and Lawrence, 1987).



(Figure 4.21) Silurian stratigraphy of the Rumney Borehole, Cardiff District (after Waters and Lawrence, 1987).