
Chapter 15 The Silurian rocks

The Parys Mountain Infold — Beds that can be shown by fossil evidence to be of Silurian age have hitherto been found at one place only, Parys Mountain, a thrust and ruptured synclinal overfold well known on account of the once rich and famous copper mines. All the rocks of the hill have, indeed, been much modified and mineralised, an account of which phenomena will be found in Chapter 19.

The northern dip-slopes of this hill are composed, it will be remembered, of dull greenish shales that may be assigned with some probability to the Barren Mudstones of the Upper Hartfell series. Rising steeply, and apparently from beneath them, is a thick bed of felsite, with an escarpment overlooking a longitudinal hollow filled with shale. To the west the felsite spreads out across the whole width of the plateau, and then bends round. No gap can be found where the streamlet issues from the west end of the hill, passing to the south of the shale and forming another bold range of escarpments along the whole length of the mountain, which is continued beyond the village of Pensarn in one or two bare and bossy hills. The limbs of felsite enclose a deep infold of black shales, different in character from any in the Ordovician beds, smooth, platy, and rather lustrous, the clastic micas being very small.

The shales are well exposed in two great open workings of the old mines, known locally as the 'Great' Opencast, (south of the 'u' of 'Mountain', a continuation of which goes as far as the road over the hill); and the 'Hillside' Opencast, east of that road and south of the summit windmill. They will be alluded to here simply as 'West Pit' and 'East Pit'. (Plate 60)

These shales have yielded an abundant graptolite fauna of characteristic Llandovery or Birkhill type. About 100 specimens have been obtained, some by the present writer, but most of them by Messrs. Macconochie and Muir. These, as well as those obtained by Mr. G. J. Williams, have been named by Miss Elles. They were obtained from the spoil banks of the opencasts, of a tunnel driven southwards from the East Pit, and of a shaft in the northern side of the West Pit known as The Colonel's Shaft: and the following descriptions will show the evidence that there is for the existence and relative positions of the several zones.

Many years ago Prof. T. McK. Hughes obtained from a position in the mine that cannot now be determined, slabs of shale with *Dimorphograptus* and *Mesograptus modestus* Lapw. From some of the later debris of the tunnel, and therefore presumably from its southern end where lower zones might be expected to rise on the fold, the Geological Survey collectors obtained *Clim. medius* Törnq. and a form at first assigned to *Monogr. tennis* (Portl.) but now regarded as *M. atavus* Jones. It is therefore clear that the zone of *Mes. modestus* is present, and that it is situated in the lower and outer portions of the fold.

In material from the bottom of the 'Colonel's Shaft', 270 feet below the floor of the West Pit, the present writer obtained [Af. 3491–3499]:

Climacograptus sp.

Diplograptus (*Glyptograptus*) *tamariscus* Nich.

Monograptus gregarius? Lapw.

Monograptus triangulatus (Hark.)

Monograptus sp.

indicating beds on or near the zone of *M. gregarius*.

In the tunnel there appears, as far as can be seen, to be some folding and disturbance, with a general dip of about 45° north. The material from the different parts of the tunnel, and therefore from the different sub-zones present therein, is all mixed together on the spoil bank.

These shales have yielded [Af. 277–298, 1205–1263]:

* Specimens marked by an asterisk have been determined by Miss Elles from material not in the Survey collection. See G. J. Williams, Note on the Geological Age of the Shales of the Parys Mountain, Anglesey. *Geol. Mag.*, 1907, p. 148.

Cephalograptus cometa *Gein.**

Climacograptus medius *Törnq.*

Climacograptus scalaris (*His.*)

Climacograptus tornquisti *E.&W.**

Diplograptus (*Mesograptus*) *magnus* *H. Lapin.*

Diplograptus (*Glyptograptus*) *serratus*, *var. barbatus* *E.&W.*

Diplograptus (*Glyptograptus*) *sinuatus?* *Nich.*

Diplograptus (*Glyptograptus*) *tamaricus* *Nich.*, *var. incertus* *E.&W.*

Monograptus argenteus (*Nich.*), *var. cygneus* *Törnq.*

Monograptus clingani (*Carr.*)*

Monograptus communis *Lapw.*

Monograptus concinnus *Lapw.*

Monograptus convolutus (*His.*)

Monograptus typhus *Lapw.*

Monograptus discretus (*Nich.*)

Monograptus gregarius *Lapw.*

Monograptus harpago *Törnq.* [— *M. lobiferus* McCoy]

Monograptus incommodus *Törnq.*

Monograptus intermedius (*Carr.*)

Monograptus involutus *Lapw.**

Monograptus jaculum *Lapw.*

Monograptus leptotheca *Lapw.*

Monograptus limatulus *Törnq.*

Monograptus lobiferus (*McCoy*)

Monograptus millepeda (*McCoy*)

Monograptus regularis *Törnq.*

Monograptus revolutus Kurck.

Monograptus sedgwicki (Portl.)

Monograptus tennis (Ford.)

Monograptus triangulatus (Hark.), var.

Petalograptus minor Elles

Petalograptus palmeus, var. *latus* Barr.*

Rastrites approximatus, var. *geinitzi* (Törnq.)

The graptolites are abundant, and the number of species is remarkable in proportion to the number of collected specimens. That of *Glypt. barbatus* is the type-specimen, first found here in 1906. That of *Ceph. cometa* is the typical specimen figured in the Monograph of the Palaeontographical Society. In this tunnel, therefore, there must be present, (as well as the Modestus Flags) beds representing the zones of:

Monograptus sedgwicki,

Monograptus sedgwicki, sub-zone of *Cephalograptus cometa*,

Monograptus convolutus,

Monograptus gregarius,

Monograptus typhus,

so that the whole of the Llandovery succession is represented in the mountain.

Further, in shale on the escarpment, on the south side of the felsite, 330 yards N. of Trysglwyn, were obtained (badly preserved, so that Miss Elles remarks, 'Have general appearance of forms indicated. Identification very difficult'.) [Af. 3615–3622]:

Monograptus cf. halli (Barr.)

Monograptus jaculum Lapw.

Monograptus cf. nudus Lapw.

Monograptus variabilis? Perner

Monograptus sp.

In the quarry near the corner of the road, 200 yards W.N.W. of Trysglwyn (also ill-preserved) [Af. 3623–3626]:

? *Diplograptus* (*Glyptograptus*) *tamariscus* Nich.

Monograptus sp. [of *jaculum*, type]

It appears, therefore, that, as well as the whole of the Llandovery, a zone of passage into the Lower Tarannon is also present.<ref>For a discussion of the Silurian fauna by Miss Elles, see p. 417.</ref>

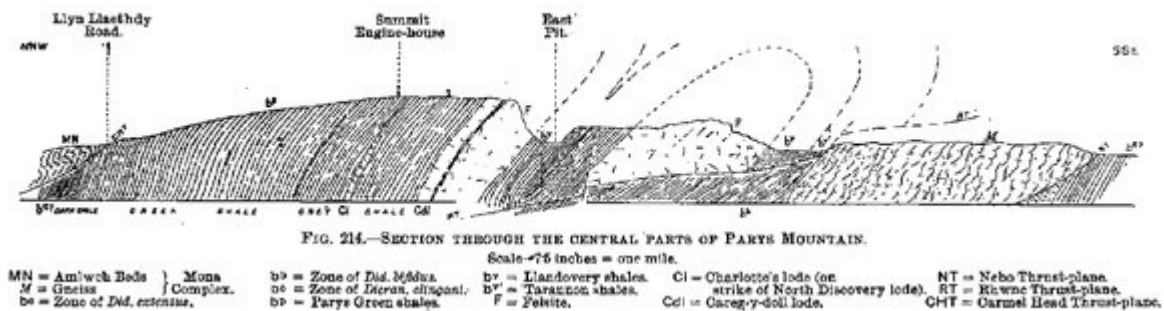
There is reason to think that the succeeding members of the Silurian series were largely composed of grit (see Chapter 22). When Llandovery and even Tarannon fossils were obtained on the southern escarpment and about Trysglwyn, it became evident that there must be a second infold of Silurian rocks, and that the wide felsite outcrop of the southern

ridge must be contained in the core of an isoclinal anticline (Figure 214). But this core must be cut off by and riding upon the Rhwnc thrust-plane (p. 459), by which also the southern limb of the second infold is cut off and carried upwards above the level of erosion.

The Rhos-mynach Infold — On the strike of the Parys infold, and about a mile to the east, at the old mine of Rhosmynach-fawr, is a high boss, 284 yards long, of a felsitic rock like that of Parys Mountain, and it is associated with shale of the same type as that which has yielded the Silurian graptolites (Figure 216). The shale is powerfully, and even doubly, cleaved, and yielded no fossils, but Mr. Muir, who searched it, agrees in recognising its lithological type. Glenkiln-Hartfell passage beds occur near it, as well as green shale of the type regarded as belonging to the 'Barren Mudstones' of the Upper Hartfell; so that there can be little doubt that at this locality there is a small infold of the Silurian rocks.



(Plate 60) Parys Mountain, the West Pit looking towards the summit. Silurian Shale, Silicified Shale, Felsite, Boulder-clay, and Spoil-banks.



(Figure 214) Section through the central parts of Parys Mountain. Scale 7.5 inches = one mile. MN = Amlwch Beds, Mona Complex, M=Gneiss, Mona Complex Be = Zone of *Did. extensus*. bb = Zone of *Did. bifidus*. bc = Zone of *Dicran. clingani*. bp = Parys Green shales. bv = Llandovery Shales. bv' = Tarannon shales. F = Felsite. Cl = Charlotte's Lode (on strike of north discovery lode) Cdl = Careg-y-doll lode. NT = Nebo Thrust-plane. RT = Rhwnc Thrust-plane.

CHT = Carmel Head Thrust-plane.

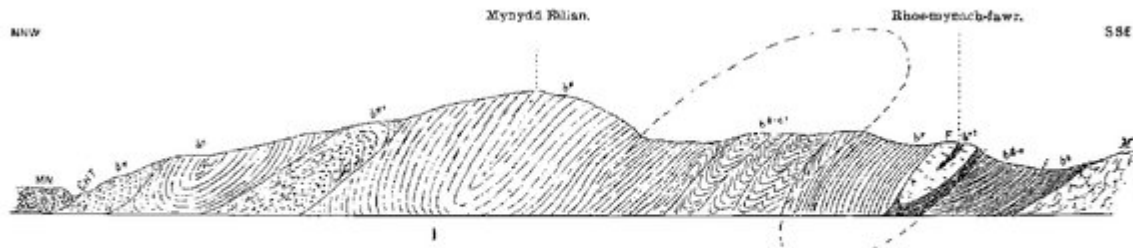


FIG. 216.—GENERALISED SECTION THROUGH MYNYDD EILIAN.

Scale—7.5 inches = one mile.

MN = Amlwch beds } Mona Complex.
M = Gneiss

CHT = Carmel Head thrust-plane.

bt = Zone of *Did. extensus* (with conglomerate).
bb = Zone of *Did. bifidus*.
bt = Zone of *Glypt. teretiusculus*.
F = Felsite.

bg-c = Glenkiln-Hartfell Passage beds.
bp = Parys Green shales.
by = Llandovery.

(Figure 216) Generalised section through Mynydd Eilian. Scale—7.5 inches = one mile. MN = Amlwch Beds, Mona Complex. M = Gneiss, Mona Complex. CHT = Carmel Head Thrust-plane. be = Zone of *Did. extensus* (with conglomerate) Bb = Zone of *Did. bifidus*. bt = Zone of *Glypt. teretiusculus*. F = Felsite, bg-c = Glenkiln-Hartfell Passage beds. bp = Parys Green shales. by = Llandovery.