Sheinton Brook

[SJ 608 042]–[SJ 608 036]

Introduction

Sheinton Brook is a section of national importance. It has the best exposures of the upper divisions of the widely distributed Shineton Shale Formation and is the original source of the rich fauna that defines the Migneintian *Shumardia* (*Conophrys*) *salopiensis* Zone and of the acritarch flora of Zone 7 (Rasul, 1979), both of which provide a standard for correlating upper Tremadoc rocks both regionally and internationally.

When Callaway (1877, p. 657) first distinguished the Shineton Shales from the Harnage Shales of the Caradoc Series, he was unable to demonstrate an unconformable relationship between the formations, but he gave convincing evidence for a stratigraphical hiatus by showing that the Shineton Shale fauna, practically all of which he obtained from Sheinton Brook, was of Tremadoc age. Detailed work by Stubblefield and Bulman (1927) confirmed Callaway's results and refined his correlations. They extended the faunal lists and established an upper Tremadoc zone of *Shumardia pusilla, later* to be renamed '*Shumardia* (*Conophrys*) *salopiensis*' Zone (Fortey and Owens, 1991b). The good preservation of material from Sheinton Brook and the fact that it is the type locality for several species has resulted in further work to revise taxa, describe trilobite ontogenies and describe new forms. Rasul (1979) used samples from the macrofaunally-controlled succession in Sheinton Brook to establish part of his acritarch zonation for the Shineton Shales.

Description

The section in Sheinton Brook traverses the strike of the Shineton Shale Formation for some 400 m (Figure 7.10). The downstream end of the section exposes grey, silty mudstones with cone-in-cone concretions, dipping at about 24° to the south-east. These are assigned to Stubblefield and Bulman's 'Brachiopod Beds'.

South of the Cressage to Sheinton road bridge the Brachiopod Beds pass up into finer-grained blue-grey shales with fewer concretions. These beds, which weather to a greenish-grey tint, are referred to the *salopiensis* Zone; they are exposed sporadically in the stream bed and banks for more than 300 m across strike and dip at 20° to 45° to the south-east. The principal exposures are at the large meanders towards the southern end of the site, and there Stubblefield and Bulman (1927, p. 112) recorded a section through about 90 m of beds. They divided the succession into seven units and tabulated the distribution within them of 28 taxa of fossils, in effect the whole fauna of the '*Shumardia pusilla* Zone', as known to them.

The brachiopods *Eurytreta sabrinae* (Callaway) and **Lingulella nicholsoni* Callaway (illustrated by Owens *et al.,* 1982) range throughout the succession and are the only species recorded in the uppermost division (* signifies a species whose type locality is Sheinton Brook). Hyoliths, bellerophontids, smooth ostracods (Williams and Siveter, 1998) and the cystoid **Macrocystella mariae* Callaway, redescribed by Paul (1973–1997), are common in places, but the priapulid-like **Palaeoscolex piscatorum* Whittard (1953) is rare (Conway Morris, 1997). The trilobite fauna includes some 20 taxa, of which the commonest are *Asaphellus homfrayi* (Salter), **Shumardia* (*Conophrys*) *salopiensis* Callaway (Figure 7.9)b, **Geragnostus callavei* (Raw, in Lake) **Platypeltoides croftii* (Callaway), **Proteuloma monile monile* (Salter), **Parabolinella triarthra* (Callaway) and **Leptoplastides salteri* (Callaway). These, which form the basis of the fauna of the *salopiensis* Zone, were described by Lake (1906–1946), and some have since been revised by Fortey and Owens (1991b) and Owens *et al.* (1982). The rare **Cyclopyge genatenta* Stubblefield was revised by Fortey (1981) and made the type species of *Prospectatrix,* and Fortey and Rushton (1980) described the shumardiid **Acanthopleurella stipulae*.

In compiling his acritarch zonation for the Shineton Shales, Rasul (1979) drew his highest samples of Brachiopod Beds, B1–B3, from the downstream end of Sheinton Brook. These are referred to the upper part of his zone 6. He took samples S1–S5 from Stubblefield and Bulman's exposures of the *salopiensis* Zone farther upstream, and used the appearance there of *Acanthodiacrodium crinitum* Rasul, *A. ovatum* Rasul *A. tremadocum* Górka, *Stelliferidium trifidum* (Rasul)

Fensome *et al.* and *Tectitheca decorata* Rasul to characterize his zone 7.

Interpretation

Exposures in Sheinton Brook reveal a south-east-younging succession representing a part of the upper Shineton Shales succession. Although the sedimentology of the silty lower beds (the Brachiopod Beds) has not been studied, it is thought that they may have been deposited in quiet (but oxygenated) conditions (Stubblefield and Bulman, 1927, p. 111). The overlying mudstones of the *salopiensis* Zone were likewise deposited in quiet conditions, as shown by the presence of undisturbed trilobite exoskeletons showing moulting configurations.

The fauna of the *salopiensis* Zone in Sheinton Brook is an important reference for the correlation of the upper Tremadoc rocks in the UK. It has yielded a large fauna, mainly of trilobites, many of which have been found in Upper Tremadoc rocks in other parts of Britain: North and South Wales (Fortey and Owens, 1991b; Owens *et al.,* 1982), the central England sub-crop (Bulman and Rushton, 1973) and the Lake District (Rushton, 1988). The correlation of these is summarized by Cowie *et al.* (1972) and Fortey and Owens (1991b). The value of the acritarch assemblages of the *salopiensis* Zone in Sheinton Brook was confirmed by the work of Molyneux (in Pratt *et al.,* 1995, p. 16) and when Rasul (in Bulman and Rushton, 1973, p. 7–8) gave evidence that the Tremadoc beds of the Deanshanger Borehole (Buckinghamshire) should be assigned to the *salopiensis* Zone, contrary to the evidence suggested by '*Dictyonema*' (=*Rhabdinopora*) but in keeping with the trilobite evidence.

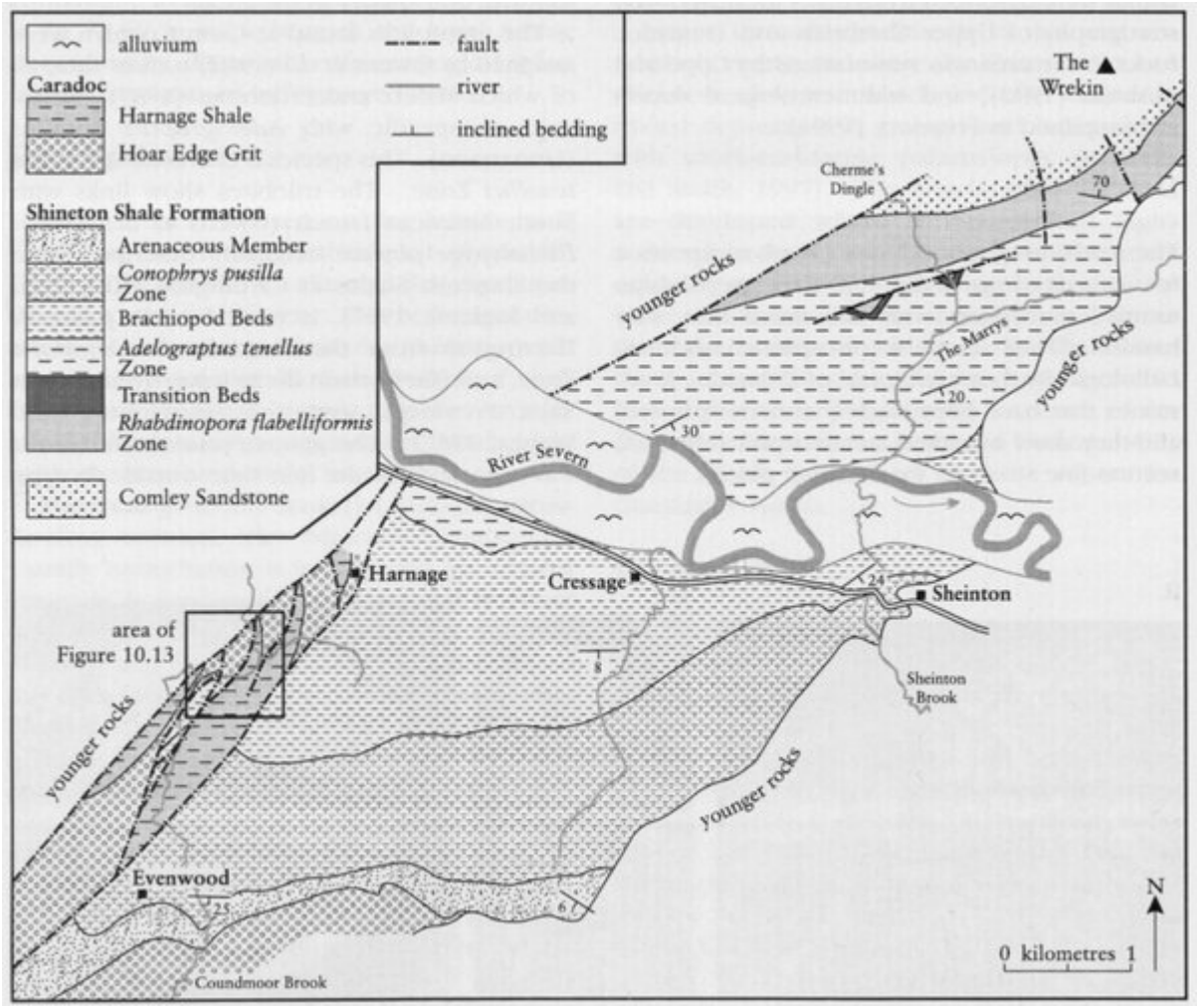
The good preservation of certain fossils in the shales of Sheinton Brook is epitomized by the delicate details visible in the type and other material of *Palaeoscolex piscatorum* Whittard (1953), which shows the jaw apparatus, the gut, and 'papillae' on the skin. Conway Morris (1997) has shown that the papillae are exoskeletal elements akin to *Hadimopella.*

Some beds contain abundant moulted exoskeletons of juvenile trilobites, allowing observations on the ontogeny of various species, for example *Asaphellus* and *Acanthopleurella.* However, the most significant is the complete suite of growth stages of *Shumardia* (*Conophrys*) *salopiensis,* which Stubblefield (1926) described (as *S. pusilla*) and from which he drew important general conclusions about growth in trilobites. The ontogeny of *Leptoplastides salteri* was likewise described by Raw (1925), and although he, too, drew far-reaching conclusions from his studies, they have not in general been accepted by later workers.

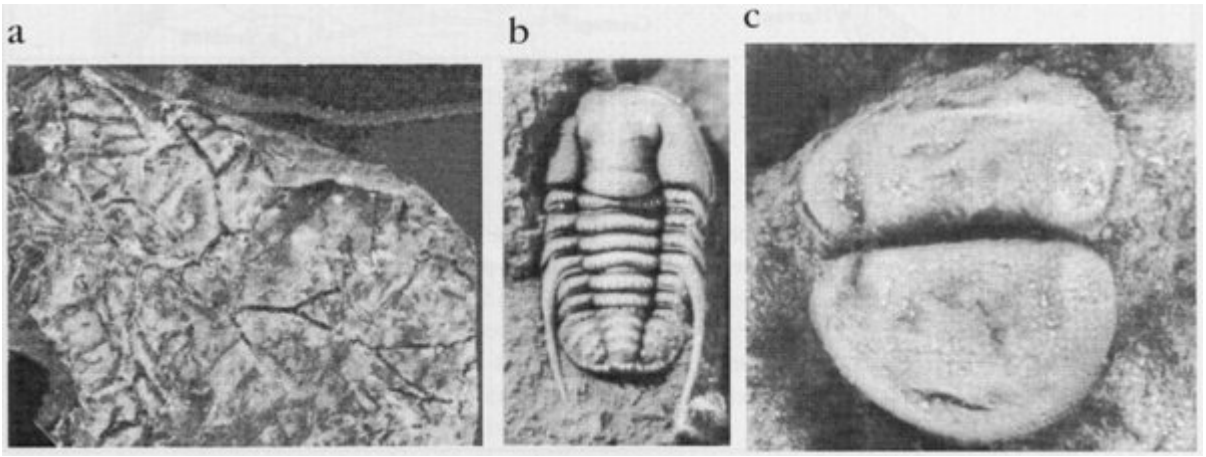
Conclusions

Sheinton Brook is of international importance because it has yielded fossil faunas typical of the upper Tremadoc Series, for which it remains a prime reference section. The faunas include the original specimens of several species, many of which have biological, taxonomic and historical significance.

References



(Figure 7.10) Geological map of the Shineton Shales of the Wrekin district, after Stubblefield and Bulman (1927, pl. 5). Coundmoor Brook includes the Tremadoc GCR site south-east of Evenwood and the type Harnage Shale locality south-west of Harnage (Chapter 10).



(Figure 7.9) Fossils from Tremadoc sites. (a) Adelograptus tenellus (Linnarsson), x 3, Cwm Crymlyn. (b) Shumardia (Conophrys) salopiensis Callaway, x12, Sheinton Brook. (c) Beyrichona triceps Matthew, x 25, Coundmoor Brook, Evenwood.