
THE PRECAMBRIAN VOLCANICS, ORDOVICIAN SEDIMENTS AND THE CHURCH STRETTON FAULT SYSTEM

Charles Hiscock

Church Stretton, in Shropshire, lies in the bottom of a narrow, almost flat valley. At first sight, it appears to be a rift valley but is, in fact, a simple fault that downthrows Silurian rocks to the west of the fault where they lie on Precambrian sedimentary rocks. The fault on the east side of the Church Stretton Valley is the primary one in a suite that transgress approximately in approximately NNE across the country on either side of the prominent hill of Caer Caradoc. (*See the accompanying map.*)

About 570 million years ago, south Shropshire lay close to the Antarctic Circle and was probably a section of an island arc. The rocks laid down in this ancient arc can be seen in the Precambrian Uriconian volcanics which are exposed along the Church Stretton fault system and to the west along the Pontesford-Linley fault. Lying between the two are late Precambrian Longmyndian sediments. During the Cadomian orogeny at the very end of the Precambrian, these volcanics and sediments were deformed and initiation of the two fault systems probably occurred, with much tear faulting affecting the formation of the Longmynd syncline lying to the west of the Church Stretton valley.

In Cambrian times, 540 million years ago, a marine transgression laid down shallow water sediments over Shropshire, notably the Wrekin Quartzite, followed by deeper water in the early Ordovician Tremadoc series, when the muddy sediments of the Shineton Shales were formed. However, tectonic conditions caused regression of the sea westwards so preventing sedimentation in the Arenig, Llanvirn and Llandeilo series. Sea level rise around 460 million years ago produced the Caradocian marine transgression over the Welsh Borderland, laying down shallow water sediments in the Caradoc-type area. The collision of Avalonia and Baltica at the end of Ordovician times produced the folding and major faulting seen in the Shropshire area.

The geological sequence in the area of Caer Caradoc and the Long Mynd can be seen on the next page.

The walk started from Willstone, a farm 2km south west of the village of Cardington by following the old road to Church Stretton, now a steep, rutted track. It climbs up over the slightly overturned Ordovician Cheney Longville Flags and the *alternata* Limestone, and then follows the dip slope of the Chatwall Sandstone. Since Roman times, the buildings have been constructed from the sandstone and the Hoar Edge Grit, which we walked over later, while the Cheney Longville Flags have been extensively used for roofing in the area. As we climbed the track we could see the Battlestones, a hill composed of Precambrian Uriconian rhyolites above the Sharpstones thrust, about a kilometre to our left.

After walking 600 metres uphill, the first locality was reached in a small quarry, being an exposure in the Chatwall Sandstones showing purplish brown broken sandstone with an almost vertical dip. Rare shell bands containing gastropods can be found in the current bedding, indicating that these were sandbanks in shallow water. A short distance further on, our next stop was about 70 metres across the field on our right. From this vantage point, Caer Caradoc, formed of Precambrian volcanic rocks, rose up in front of us. In the slightly lower ground between us and the hill, the third fault (F3) of the Church Stretton fault complex, running SW/NE, cut through the Harnage Shales and Hoar Edge Grit. The F2 fault could be seen beyond, approximately a third up the slope of Caer Caradoc, and marked by slight changes in topography and vegetation.

Geological sequence in the area of Caer Caradoc and the Long Mynd, (from Toghill).

Ordovician	Caradoc Series	Cheney Longville Flags <i>alternata</i> Limestone Chatwall Sandstone Chatwall Flags Harnage Shales Hoar Edge Grit <i>unconformity</i>
	Tremadoc Series	Shineton Shales
Cambrian	Merioneth Series	Black Shales Grey (<i>orusia</i>) Shales
	St. David's Series	Upper Comely Sandstone
	Caerfai Series	Lower Comely Sandstone with Comely Limestones Wrekin quartzites
Precambrian	Wentnor Group (Western Longmyndian)	
	Stretton Group (Eastern Longmyndian)	
	Uriconian Volcanics	Little Caradoc Basalts Caer Caradoc Rhyolites Caer Caradoc Andesites Ragleth Tuffs

The track went downhill for about 120 metres over the Chatwall Flags and the Chatwall Sandstones, both with nearly vertical bedding, and then became quite muddy and boggy, marking the position of the Harnage Shales. Fault F3 could be seen by the abrupt change of terrain where the Hoar Edge Grit starts, marked also by a slight ridge. Some 400 metres onwards, a small exposure of the grit yielded moulds of brachiopods and dreikanter (or ventifacts) of quartz - windblown quartz grains with polished faces. The Grit is interpreted as the base of a Late Ordovician shoreline.

Taking the footpath to our right, we walked up the broad slope of Caer Caradoc over well-drained ground on the Hoar Edge Grit with, to our left and lower down, further boggy areas marking the Harnage Shales, with an obvious line of springs at the junction of the two beds.

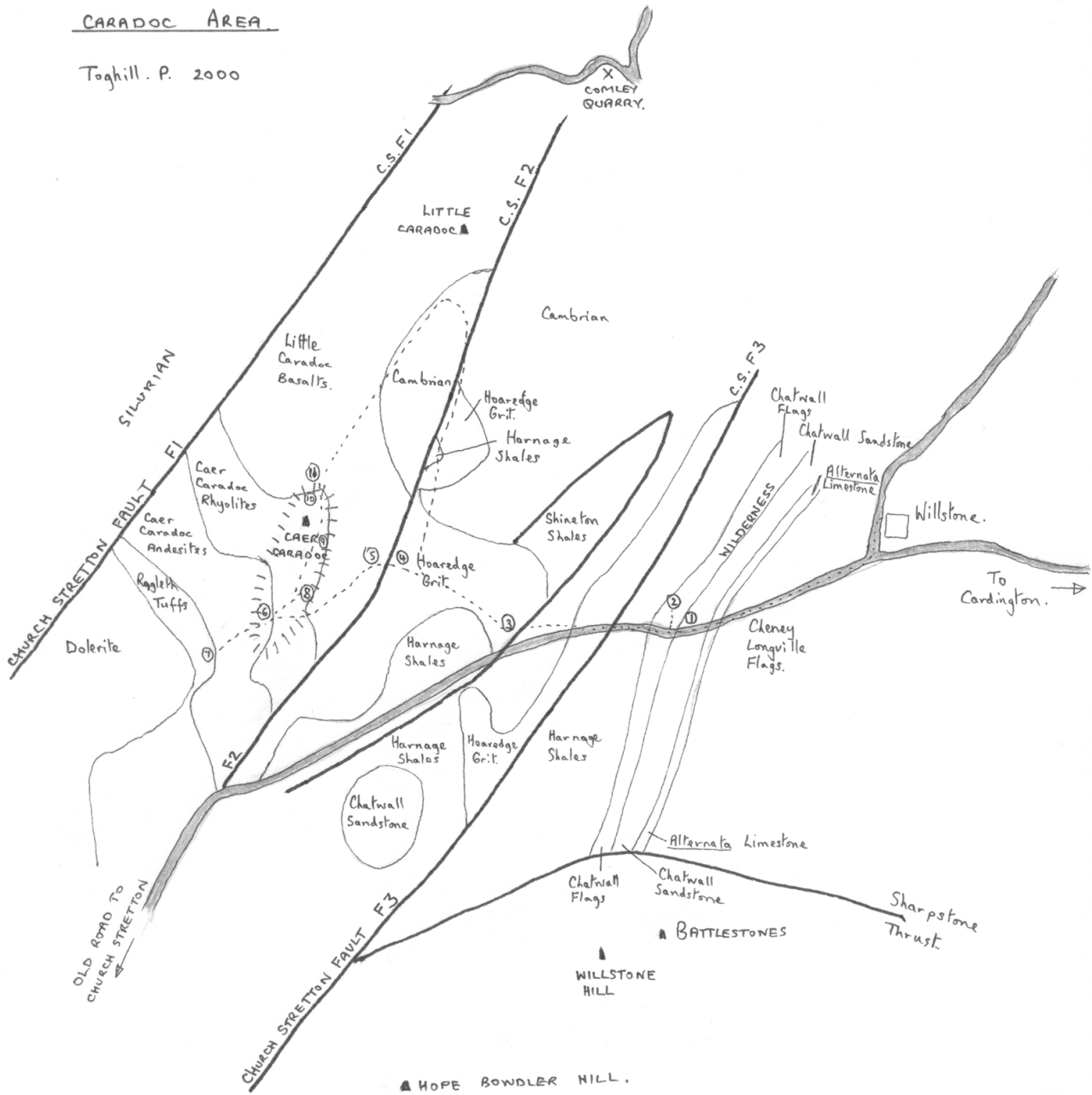
At the bottom of the steep north slope of Caer Caradoc where the path passes through a gate, a stop was made to admire 'Murchison's View'. Looking east: over fault F2 from the slope formed of Uriconian volcanics, we could see the long wooded ridge of the Silurian reef which is Wenlock Edge while further around to the south, the Battlestones ridge rose up only a kilometre or so from our vantage point. This Uriconian volcanic suite is formed from andesites with some basalts and rhyolites.

Resuming our walk in the bright sunlight, we climbed the steepening slope to the summit of Caer Caradoc, passing through a depression in the wall of the Iron Age fort earthwork which encircles the top of the hill. At the southern end, we looked down into Church Stretton valley where the primary fault F1 of the Church Stretton Fault system downthrows the Silurian sediments to the valley floor. Beyond them, the Precambrian Longmyndian sediments rose up as well-rounded, bare hills. Around us, the grey vesicular Caer Caradoc andesites could be examined easily while, about 200 metres down the south ridge, an obvious outcrop of rock of different colour and texture marked the finely bedded Ragleth Tuffs. These dip steeply to the west and show clear bedding. They are Precambrian rocks and are part of the Longmyndian Group of, probably, water-lain sediments laid down in an adjacent fore-arc basin. Climbing back from the exposure of the Ragleth

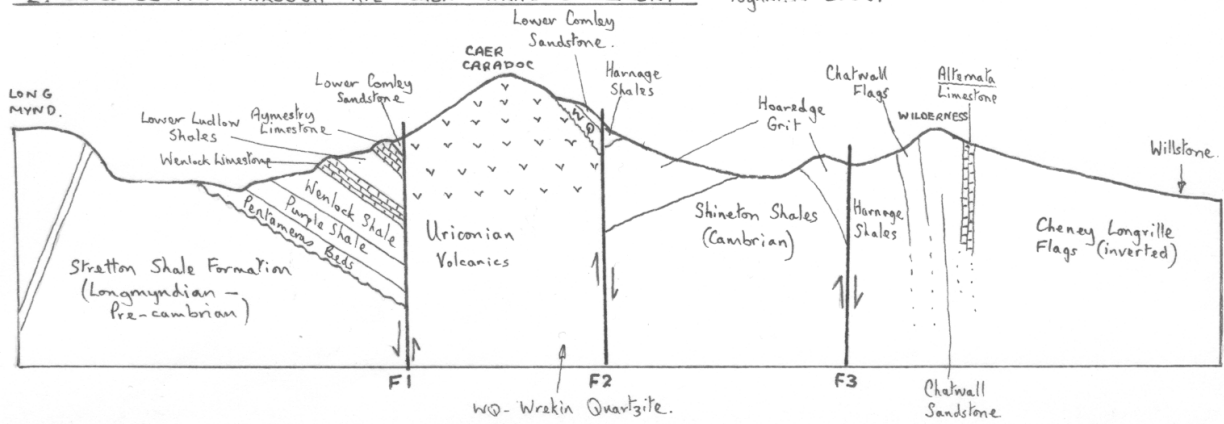
1. OUTLINE GEOLOGY OF THE CAER

CARADOC AREA

Toghill. P. 2000



2. CROSS SECTION THROUGH THE CAER CARADOC AREA. Toghill. P. 2000.



tuffs, we reached the main ridge and then moved north to the highest point of Caer Caradoc which is marked by the pink crags of the Caer Caradoc Rhyolites - fine-grained acid lavas or pyroclastic flows which are clearly brecciated and, in places, show flow banding. The rhyolites are faulted against the andesites and have been dated on Overly Hill, near the Wrekin, at 566 million years. To the north of the peak of Caer Caradoc, the rhyolites are vesicular with amygdales of chalcedony.

From our vantage point, there was an extensive view of the Fault system to The Lawley and The Wrekin in the north, the scarp and vale scenery of Ordovician and Silurian sedimentary rocks of Wenlock Edge to the east and then the Carboniferous-topped Clee Hills, near Birmingham.

On the north slope of the hill, small exposures of black vesicular basalts can be examined with amygdales of calcite and chlorite. On this side, called Little Caradoc, the basalts are not contemporaneous with the rhyolites, having been faulted against them but with the contact not now visible.

From the last locality, we returned to 'Murchison's View' and then retraced our steps back to Willtown.

The walk was led by Dr. Peter Toghill of the School of Continuing Studies at the University of Birmingham as part of the weekend organised by the Shropshire Geological Society and gave a new perspective on the geology of the Church Stretton area which had not been visited since a Bath Geological Society weekend in the 1980s, led by Professor Mike Bassett of the National Museum of Wales.

(The itinerary of the walk will be published in the new GA guide to Shropshire, due out sometime in 2001).

**from MOUNTAINS AND MINERALS,
RIVERS AND ROCKS**
M. Dane Picard

In Wind River badlands layers
I look for form
The ghosts of folds
Flexed and frozen
In deformation.

Anticlines are hard to find
That hide under covers
Where limbs are smoothed
Their crests subdued
Below pastel Tertiary strata

Oil hunters reach deep
To draw contour lines
Of flanks defined by dip and strike
Warily expressed above timeworn
Arches undrilled by anyone.

I think of how
I traced in sand and clay
One fall, North Sand Draw*
Across rock axes,
Up and down their plunge.

Geologists like to close
Contours and drill
The chaste dome
They know in basins
Their rivals little court

Here on green stream strata cut
In black mica and scarlet quartz
I listen for rotary sounds
Drill this structure, Texaco, please.
A wild rock hammer longs to ring.

** North Sand Draw is an anticline*

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This poem was submitted for the Journal by Ruth Abbott.