

EASTERN WILTSHIRE - EDGE OF THE LONDON BASIN AND THE STRUCTURE OF THE VALE OF PEWSEY

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It was a grey, damp 23rd of April, with a cold easterly wind for our 'annual' outing into Wiltshire, led by Isobel Geddes (author of "Hidden Depths: Wiltshire's Geology and Landscapes" published by Ex Libris Press, 2000) - very unlike previous years when we have had warm sunshine. The wind was particularly penetrating for our first stop at Chisbury Hill fort, to look at the landscapes and general overview of the geology to the east of the Vale of Pewsey, around the villages of Chisbury, Great and Little Bedwyn, and in Savernake Forest. Using the map and section from her book, (*diagrams 1 and 2*), Isobel explained that we were on a gentle anticline of the Chalk with erosion having removed the overlying Tertiary beds in some areas, while in others they remained, capping the Chalk and generally supporting only woodland. The Chalk anticline dips steeply. However, in spite of the poor visibility, we could see the rounded hills to the north and east were capped by woodland, indicative of the Reading Beds and London Clay, called 'Clay-with-Flints', because the land is difficult to work, is poor quality and drains very slowly. Underlying the Clay-with-Flints, and in the valleys and hillsides where erosion has stripped off the Tertiary sediments, Chalk comes to the surface. A thin covering of the Clay-with-Flints, derived from the Tertiary and underlying Chalk, often just cloaks the Chalk. Most of the buildings are built of flint and rubble of which the 13th century Chisbury Chapel of St. Martin, long-time ruined, is typical.

We were pleased that the first stop was of short duration so that we could return to the warmth of the cars for the short drive to Stype Wood. This is typical of the woodland on the Clay-with-Flints and where we were able to see features of the Tertiary - rounded flint pebbles lying on the surface composed of clay with sandy deposits where water had washed out and concentrated the sand. Isobel took us into Stype Wood to a depression where a small stream was running down the slope, amongst the trees. At the lowest point of the depression, the stream disappeared into two or three small holes, each no more than 12 cm. diameter and

surrounded by deposits of buff-coloured, clean sand. Where was the water going? The clays had stopped the water from sinking into the soil, but over thousands of years, the clays had gradually thinned by erosion until the Chalk was just barely covered in the bottom of the depression. Here, the water had formed a 'sink-hole', running into and dissolving out the Chalk, leaving a void which had been filled by the overlying sediments.

So far, we had not, by following the sequence downwards, seen any Chalk, although in Stype Wood we must have

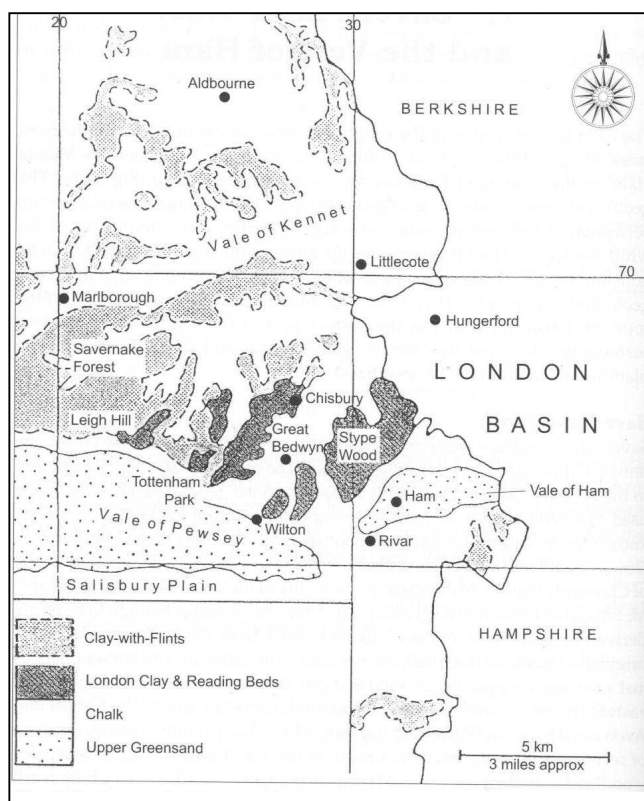


Diagram 1: Geology of the the Savernake Forest and the Vale of Ham (reproduced with permission from Isobel Geddes)

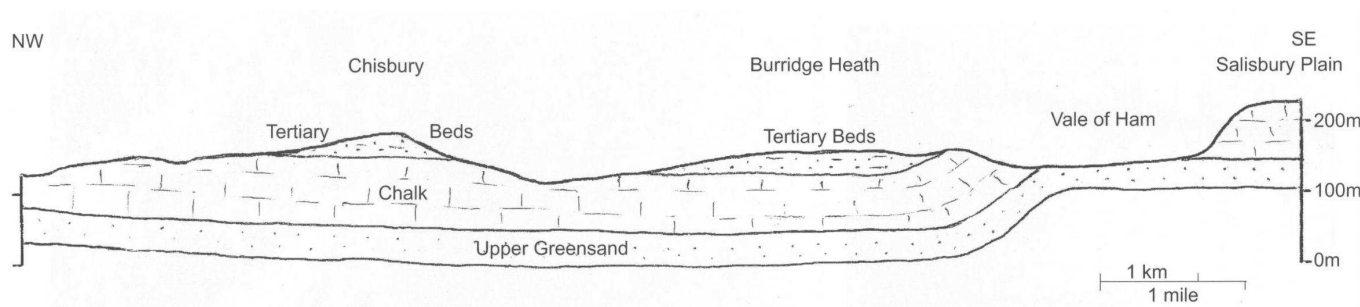


Diagram 2: Section across Chisbury hill-fort, Burr ridge Heath and the Vale of Ham (reproduced with permission from Isobel Geddes)

been within a metre or so of its top surface. Our next stop was in a Chalk quarry near Littlecote House Hotel where we were able to see about 10 metres of Upper Chalk face with abundant flints. The rather weathered rock faces made the quarry insecure but the floor of the quarry was strewn with Chalk and flints. The latter had produced the weirdest of shapes from spheres about cricket ball size to large rocks of fantastical, even erotic form. Most interesting were the obvious fossil sponges (*photograph 1*) while some cracked flints contained hollows of delicate crystals and chalcedonic forms, (*photograph 2*).



Photograph 1: Fossil sponges preserved in flint



Photograph 2: Chalcedony in flint nodule

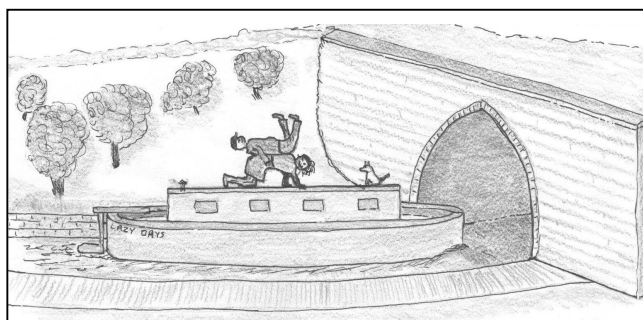
In the middle of the quarry, and extending the full depth of the face, an earthy mound stood out from the surface on which much vegetation had grown. This was the side view of a sink-hole, where the water had dissolved out the Chalk and filled the void with the overlying Clay-with-Flints or later Quaternary sediments. Some of the members collected specimens of the sponges and flints for later examination.

It was decided that lunch would be taken in the carpark of the Crofton Pumping station, a few miles to the west. Driving along the road to Crofton, at Great Bedwyn, we were able to look at the dinosaur footprints outside the Post Office. On arrival at the car park, we casually asked if others had seen the footprints, only to be met with cynical

disbelief and accusations of 'leg-pulling'. But, sure enough, the footprints were there, surrounded by tombstones, memorials with doggerel verses, stone figures and carved stone-work - even an ammonite. It is understood that the memorial mason next door to the Post Office, had collected the items, many from redundant churches.

The Crofton Pumping Station was built to supply water to the Kennet and Avon Canal at its highest point using two steam driven beam engines. Although now about 220 years old, they are still run at certain well advertised times.

It was another feature on the Kennet and Avon Canal which we were to visit next - the Savernake Tunnel, where the canal runs through the Greensand and, although not far below the surface, geological conditions forced the canal builders to tunnel for about 200 metres. In fact, they had to line the tunnel with 2 million bricks made at the brickworks in the Gault Clay at Caen Hill, Devizes (to the south of the lock flight) and brought in along the canal. The tunnel is about 12 feet wide and 14 feet high at its apex, with no towpath which begs the question - how did the early barges pass along the tunnel? Well, they were 'legged' through (to which I hear "no-one's got legs as long as that!). I am told by an expert on canals that the bargees would put out 'legging boards' on which they lay on their backs or sides and pushed the barges through by 'walking' along the sides of the tunnel - one each side to equalise the push on the barge. Another fact of interest was that the main railway line (known as the Berks and Hants line) from Reading to Taunton had been laid parallel, and very close to the canal on the north side, both exploiting the contours and lowest point of the land.



Legging It

Bargee wife to bargee, "When you said we had to leg it through, I didn't hear anything mentioned about piggy-backs."

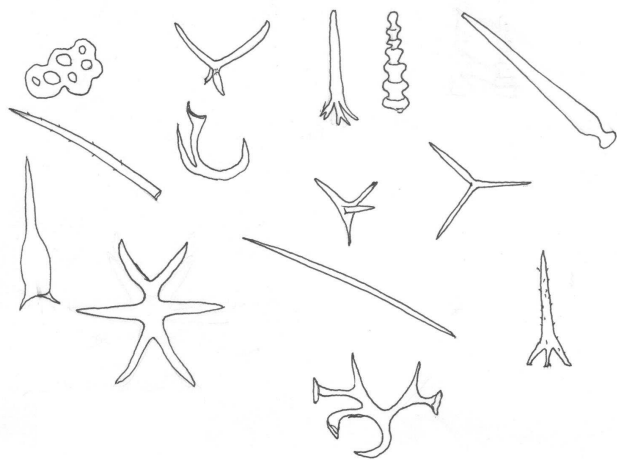
Bargee, "Don't worry about that - turn round, we're facing the wrong way."

Leaving the tunnel, we entered the eastern end of Pewsey Vale where the openness of the country was in direct contrast to the wooded hilltops and attractive villages nestling in the valleys. Referring to the geological diagram, we were now on the top of the anticline, with the Tertiary and Chalk eroded away so that Greensand, which underlies the Chalk, is uppermost. The valleys and wooded hilltops had given way to the soft undulating fertile Vale of Pewsey

with huge fields of crops extending in all directions. To the north, the rolling Marlborough Downs are formed by the dip of the anticline while, in the south, on Pewsey Hill, the scarp is much steeper because the Chalk dips south at a lower angle but is capped by a hard rubbly Chalk, The Melbourn Rock. This has protected the softer underlying Lower Chalk from erosion and marks the base of the Middle Chalk. We were able to see this at the last site on our field trip at Milton Lilbourne Quarry, about 1 mile south of the village and high on the edge of Salisbury Plain. In contrast to the Chalk at Littlecote House quarry, there were no flints and, although not abundant, we were able to find fossils such as the bivalve *Inoceramus*, Rhyconellid brachiopods but no sponges. From the western lip of the quarry there is a fine view over the Vale of Pewsey which, just as we were leaving, came out from under the grey cloud into bright sunshine, enabling us to get a good appreciation of the steepness of the scarp, the dry valleys and the attractive pattern of the Springtime greens.

We had had a very interesting day in East Wiltshire where Isobel had demonstrated the importance of the underlying geology in an area where centuries of habitation and cultivation had removed most of the obvious signs, particularly on the Chalk downs and the Vale of Pewsey.

Postscript 1: During our visit to the Chalk quarry where flints were collected, many sponge fossils were found. Many of these hollow fossils contained chalky debris which has been washed out into fine sieves. Once the material was dry, examination under a binocular microscope showed a welter of spectacular shapes of the sponge spicules, every one preserved in the most delicate detail in silica, (*diagram 3*). In the photos, some of the fossils can be seen while the drawing shows a range of spicules and skeletal structure. With the sponge material there was a selection of foraminifera.



*Diagram 3: Sponge Spicules x 10,
Littlecote Quarry, 23-04-05*

Postscript 2 - "Legging it".

While on holiday in Derbyshire, during June, my wife and I visited the Cromford Canal, near Matlock. Walking about a mile south from the town along the towpath, we came to the wharf where the Cromford and High Peak Railway loaded coal from narrow boats into railway wagons to transport it over the hills of Derbyshire to the Manchester area. In the station building, now a book and information shop, we saw a book on the Butterley Canal (near Ripley, Derbyshire). On the front cover was a reproduction of an old sepia photo of the portal of Butterley Canal tunnel. The photo showed a narrow boat, either entering or leaving the tunnel, with two men lying on their backs, head to head on boards, with their legs extended over the water on each side of the boat, 'legging' the boat through the tunnel. This is surely how the narrow boats were moved through the Savernake Tunnel.

YET MORE EXTRACTS FROM TAG

More Student Wisdom

A trench with ocean crust on both sides may attempt to consume a continent (usually unsuccessful).

It is presently believed that the moon is hollow to some degree.

That was what they came to the conclusion of.

Apparently, studies have shown that the Earth is the nicest planet to live on.

The surface of Mars resembles a huge dessert.

Exceptionally hot conditions encourage materials to melt.

Oceanic crust is very high profile compared to some other crustal types.

Palaeomagnetism offers evidence of continental drift because we can safely assume there is only one pole at a time.

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