



This is a supplementary information sheet on the geology, history and archaeology along the Great Missenden Walk in the 'Walks in the Misbourne Valley' leaflet. See the main walk leaflet for route directions.

Background Information

The Chiltern Hills Area of Outstanding Natural Beauty is a unique place of great beauty and wildlife interest. It incorporates a wide range of landscapes shaped by its geology and history.

The Chilterns geological story began c. 100 million years ago when sea levels rose more than 300m due to global warming. The chalky muds deposited on the sea floor eventually became today's chalk. The rounded hills and deeply dissected dry valleys of the Chilterns are actually very recent, sculpted by melting glaciers about 450,000 years ago.

Stone Age hunters and gatherers lived in the Chilterns.

Neolithic settlers cleared trees to grow crops, leaving behind their burial mounds and starting the process that created flower-rich chalk grassland.

The Anglo-Saxons knew this area as Cilternsetaen, a 'god-forsaken place that no-one in their right minds would want to settle'. But settle they did, leaving Anglo-Saxon names such as Goring, Bledlow, Wycombe, Chesham and Luton to remind us of the many groups of people who have lived, farmed, traded and died in the Chilterns.

Chalk & Chert

The entire length of the Chilterns is underlain by chalk. This very pure, white limestone gives this area its distinct character and has a fascinating history. Chalk is a form of limestone produced in a warm, open sea which is a very long distance from the nearest shoreline. These hills prove that the Chilterns area was once under a tropical sea. Chalk is made of the tiny skeletons of marine algae called coccoliths. These are so tiny that many thousands of them would fit on a pin-head! In fact, they are so small that they still float in the water column after the algae die – these microscopic plates would not normally settle on the sea floor. So why are they here? Each one comes from an alga that was eaten by a shrimp or another algae-eater. The tiny plates of the algal skeleton pass through the gut to fall on the sea floor. So you could think of chalk as shrimp poo. When did this happen? During the Cretaceous period, about 110 million years ago, global warming melted both ice caps and sea-level rose to an all-time high (at least 300 m above the present level). This is when the chalk was laid down.

The remains of other animals that lived in the sea survive as fossils in the chalk. At the end of the Cretaceous (65 million years ago) the sea retreated, global temperatures fell, and the Chilterns became a flat expanse of chalky mud. The beautiful, rounded hills which are so characteristic of the Chilterns landscape were sculpted during a global cooling or 'ice age' 63 million years later.



Church of St Peter & Paul



Mobwell Pond

Features of interest along the walk

1 Sarsen stones: as you walk along the footpath from the back of the car park note the grey Sarsen stone at the first stile. Feel its rough texture of quartz grains. Many of these mysterious rocks are found in Buckinghamshire. Sarsen is a corruption of saracen meaning 'stranger in a field', because that's what they are: isolated stones in fields and woods. Geologists spent many years trying to work out what they are. It is now believed that they are fragments of river beds that existed across southern England perhaps as long as 40 million years ago. The climate was then hot and semi-arid, suitable for producing the quartz sandstones with a tough quartz cement that you see here. In the Ice Age river beds were broken and scattered as blocks in many different locations by freezing and thawing: freeze-thaw breaks up rocks and the blocks then slid down wet, muddy slopes before vegetation began to hold the soils together.

2 Misbourne stream bed: the Misbourne has often been dry here. Streams dry up when the level of the water table (the water in the ground) is lower than the ground surface. Many streams have dried in recent years as the water table fell because of over-abstraction (water pumped out to supply our needs) as well as low rain-fall. Note the cut the river has made in the past. The sands and clays you walk over on the valley floor are the floodplain deposits laid down when much more water was available.

3 Mobwell Pond: opposite the Black Horse pub, a spring of clear, fresh water once rose from the chalk here to feed the Misbourne. The thriving alders show water may not be far beneath the surface as these trees are common close to water, even growing within marshy areas.

4 Dry valley and rolling hills: after crossing the railway look back at the typical Chilterns landscape of grassy hills and beech woodland. The Misbourne valley bottom here lies at 120 to 125m OD (Ordnance Datum, which is mean sea level) and the chalk hills rise to 190m OD on either side. These hills are formed by a rock known as the 'New Pit Chalk Formation' which breaks down to create a thin chalky soil which is poor in nutrients. Fields on the valley floor are much more productive because they lie on rich alluvium deposited when the Misbourne flooded in the past.

5 Angling Spring Wood: is an ancient woodland of many tree varieties, but particularly rich in beech. This was Roald Dahl's local wood and the 'Witches Tree' inspired the story of *Fantastic Mr Fox*. The tree is now on the ground, having been blown down in a gale during 2003. The wood is home to a vast range of plants and animals, not just foxes, including rare slugs and fungi. You can sense when you get near the spring – the air feels cool and damp even when there is no surface water. Visit www.anglingsspringwood.org.uk to download lots more information and a talking trail.

6 The George Inn: built in the 15th century, this is the oldest inn in the village. London Road was once (as its name suggests) the main route to and from London, so there were numerous coaching inns on this road. The George was particularly important because it was also the site of the Court House.

7 Warren Water: this was part of the garden landscaping by the Oldham family who owned Misbourne Abbey at the end of the 18th century. Look into the river bed from the bridge to see a large collection of local sarsen stones used as part of the 'water feature'. The lake fills when the Misbourne is flowing but dries up when the river loses flow. Looking north from the bridge the Abbey stands above its lawns. This is an elegant re-build following a major fire in 1985. Missenden Abbey was founded in 1133 for Augustinian canons. It is recorded that in the early 1200s there were a fair number of suicides amongst the novices; the reasons were never disclosed. The Abbey was dissolved in 1538 by Henry VIII, and the building began a long history as a country residence for wealthy families starting with Richard Drury of Chalfont St Peter.

8 The Church of St Peter and St Paul: this medieval church includes many local rocks. Look for local cream-white 'clunch' (chalk rock); blackish and mottled flints, local cement, and even Roman roof tiles! The beige blocks of Portland limestone (from Dorset) are newer repairs from about the Victorian period, because local rock was no longer available.



The Big Freeze

Like all Chiltern valleys, the Misbourne valley is relatively young. These valleys were sculpted by the extremes of the ice age climate starting about 2.6 million years ago, although most are less than half a million years old. Three major ice ages affected the Chilterns, but in only one – the Anglian – did the ice sheet actually reach this area.

Normally water flows into the pores of chalk, but Ice Age permafrost (soil frozen all year) shaped the valleys by forcing meltwater to flow over the frozen surface, cutting deeply into the chalk. These cuts are the dry valleys of the Chilterns. Some, like the Misbourne, have streams flowing in them today as the valley eventually cut down to the post-Ice Age water table allowing springs to flow onto the surface.

Further Information

This information was collated by Chilterns Archaeology. This group aims to promote awareness and increase knowledge of the archaeology of the Chilterns and membership is open to all. Chilterns Archaeology organises working parties, talks and events in the Chilterns.

For further information visit www.chilternarchaeology.com or email chilternarchaeology@bopenworld.com
You can download more Chilterns Walks at www.chilternsaonb.org