



A short summary of the geological past which can be viewed from or near Whiteleaf Hill.

There are 170 million years of Earth's history visible from the viewpoint at Whiteleaf Hill. The youngest rocks are lying on the top of the hill and the oldest are down in the Vale of Aylesbury. They tell an amazing story of a land inching its way across the Earth's surface, gradually northwards, to our present position. These pages are designed to be used in conjunction with the metal viewpoint mounted directly above Whiteleaf Cross, together with the annotated view at the beginning of this book, local maps, and the first part of the timeline pages.



GEOLOGY





176-170 million years ago: tropical seas cover Bucks.

The Great Oolite rocks.

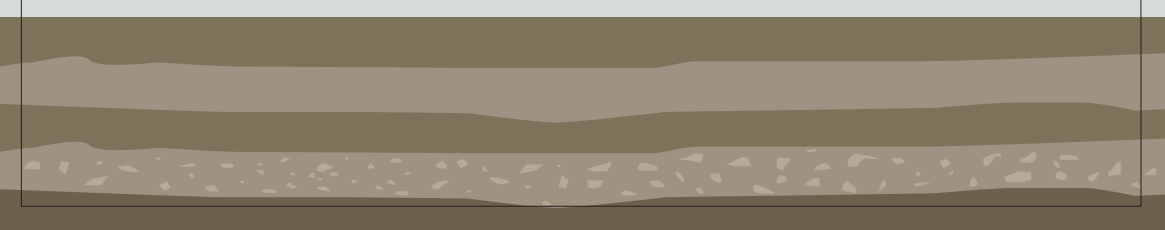
These rocks are Middle Jurassic in age and are evidence for a period of time when the warm, shallow seas forming the earlier fossiliferous limestone began to shallow. The result is a rubbly set of limestones containing much fossil debris (the fossils were smashed by waves). These limestones are called Forest Marble and Cornbrash and are mostly hidden beneath the surface (200m beneath Whiteleaf for instance), rising to ground level at several points west of Brill.

170–150 million years ago: the seas deepen. The Kellaways Beds and the Oxford, Amptill and Kimmeridge Clays.

This sequence of sticky muds reveals a return to deepening seas. The clays represent progressively offshore muds indicating deeper and deeper waters. Today these clays produce a flat, featureless landscape. They lie under the north side of the Vale of Aylesbury, in a band stretching from Aylesbury via Long Crendon to the west of Thame.

150-145 million years ago: the seas fall again. The Portland and Purbeck Beds.

Buckinghamshire is the most northerly source of a famous Dorset rock called Portland Limestone. This rock was formed in a shallow sea and can be seen in numerous buildings of the area, particularly the churches such as St Mary's in Princes Risborough. Sea-levels fell further to allow the lagoonal muds of the Purbeck Beds to be deposited with their associated freshwater fossils. Being slightly harder than the surrounding soft clays, they stick up as a line of tiny hills such as Shotover, Brill, Chilton, Long Crendon, Ashendon, Haddenham, Cuddington, Upper Winchendon, Waddesdon and Hartwell; for this reason, the line is often called the mid-vale ridge.





140 million years ago: Whiteleaf becomes land.

The Whitchurch Sands.

Much of the early Cretaceous is missing in Bucks (known to geologists as a large unconformity). This is the result of about 40 million years of uplift and erosion as a land area. The Whitchurch Sands (sands and ironstones) are the only remaining evidence of large rivers which flowed across this land. Brill and Whitchurch Hills, which can be easily seen from Whiteleaf, are capped with these harder rocks.

115-113 million years ago: the seas break through.

The Lower Greensand.

Following this gap in our geological history the sea broke through forming a narrow seaway cutting across the eastern side of the country from the Wash to the Isle of Wight. The seaway deposited the tidal sands of the Lower Greensand. These sands once covered a much wider area of Bucks than they do today; erosion has left only remnants in the Brickhill area. This sudden incursion by the sea heralded the biggest global warming the Earth has ever seen. The evidence for this lies in the overlying muds and chalk



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113-97 million years ago: the seas deepen and deepen...

The Gault Clay.

Although at first a shallow sea, a gradual deepening provided a quiet, offshore sea within which fine clays settled out. Within the clay are phosphate bands and abundant fossils. If you live on the Gault at Longwick, Aston Sandford, Kinsey and Towersey, for instance, you might dig these up in your garden! There are a few outliers of Gault Clay, notably at Chilton and Long Crendon, where they cap the tops of the hills. The clays became chalkier as the seas got deeper, thus heralding the beginning of The Chalks.

About 110 million years ago a massive global warming began.

The Chalks

Both ice caps melted and sea-levels rose to an all-time high (at least 300m above the present level). The result was a widespread deposit of hundreds of metres of soft mud made from microscopic plankton, which later hardened into chalk. The entirety of the Chilterns is made up of these deep layers of chalk (Lower, Middle and Upper).

The majority of Monks and Princes Risborough lies on the pale grey, chalky clays of the Lower Chalk. The boundary of the Lower and Middle Chalk is marked by The Melbourne Rock, a hard bed which forms a notable ledge on the topography at the foot of the escarpment, just before the housing areas of the town. The steepest incline of the chalk escarpment is formed by the Middle Chalk, the uppermost 10m of which forms the slopes immediately below Whiteleaf Cross. A harder bed of chalk marking the boundary between the Middle and Upper Chalk is known locally as Clunch and has been a common building stone in the past. The Upper Chalk forms the top 50m of the Chilterns escarpment, including Bledlow Cop and Whiteleaf Hill.

