LOCAL GEOLOGICAL SITES
THURROCK DISTRICT

GeoEssex
Promoting the geology and landscape of Essex

ThG7 Gravelhill Wood

Site location: Gravelhill Wood, Langdon Hills (part of Langdon Hills Country Park)

Grid reference: TQ 6775 8637

Status: Publicly accessible

Summary of the geological interest:

The Langdon Hills straddles the boundary between the districts of Thurrock and Basildon. This high ground is capped with Bagshot Sand and the enigmatic flint gravel known as 'pebble gravel' (also known as Stanmore Gravel), the origin of which is not fully understood but may have been laid down by northward-flowing south bank tributaries of the 'pre-diversion' Thames up to a million years ago.

Gravelhill Wood, southwest of the church, contains at least two large and obvious gravel pits, very overgrown, but with plenty of gravel visible here and there, especially where trees have toppled over or badgers have been at work. Gravel is also showing in the banks on the side of the adjacent Old Church Hill. Gravel Hill car park is on the edge of the wood.

There are panoramic views over the present Thames Estuary and across to London, although some viewpoints have been lost due to uncontrolled tree growth.

Site Assessment. *Local Geological Sites (LoGS) in Essex are assessed using criteria based on DEFRA guidance. An assessment form is used which asks key questions under four value categories: scientific, educational, historical and aesthetic. This site has been assessed and qualifies under these criteria.*

Date of selection/last revision: November 2020

The Langdon Hills

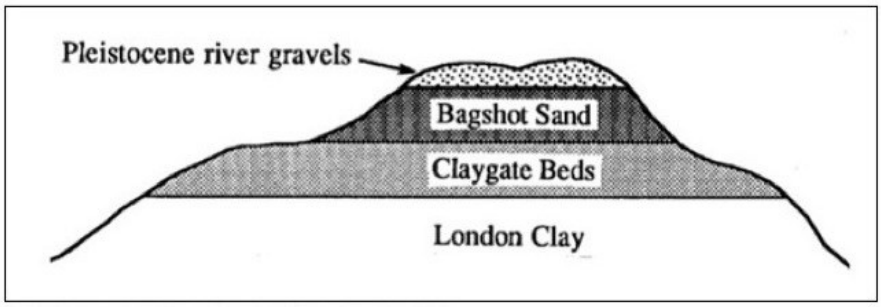
The Langdon Hills are composed of an isolated patch of Bagshot Sand overlying Claygate Beds and London Clay, and the summit, like other similar high points in the area, is capped with flint gravel. The Bagshot Sand and the overlying gravel were formerly visible in several small pits in the area.

The Bagshot Sand, Claygate Beds and London Clay were formed on the floor of a sub-tropical sea some 50 million years ago but the gravel at the very top of the hill is clearly much younger and of a different origin. Originally known as 'pebble gravel', and called Stanmore Gravel on modern geological maps, this gravel was for years thought to have been laid down under a sea but it is now thought that it may have been deposited by a river. But how could river gravel, of geological recent origin, be capping the tops of some of the highest hills in the region?

For many geologists the riddle of the pebble gravel has now been solved by studying the pebbles it contains. Although mostly of flint, a small proportion are distinctive pebbles of chert from the Lower Greensand of The Weald, and other rock types that could only have been deposited by a river flowing from the south. Similar gravels are found capping the high ground in Epping Forest and the Rayleigh Hills. These isolated outcrops of gravel date from the early part of the Ice Age, perhaps as much as a million years ago, and were probably laid down by northward-flowing tributaries of the Thames, when the Thames flowed across north Essex and Suffolk before its diversion to its present course by the Anglian ice sheet 450,000 years ago.

It is difficult to believe that this gravel may originally have been the floor of an ancient river valley. Curiously this gravel may even be the reason these hills are here, the gravel protecting these parts of Essex while the surrounding land was reduced to the present lowland by hundreds of thousands of years of erosion.

Although only partly within the district of Thurrock the Country Park is run by Thurrock Council's Ranger Service.



Section through the **Langdon Hills** showing the bedrock strata overlain by river gravel. The gravel is known as Stanmore Gravel (formerly called pebble gravel) and may be as much as a million years old.

References:

BRIDGLAND, D.R. 1999. **'Wealden Rivers' north of the Thames: a provenance study based on gravel clast analysis.** *Proceedings of the Geologists' Association*. Vol. 110. Pages 133-148

COLE, W. 1908. **Visit to the Laindon Hills, Essex in conjunction with the Geologists' Association.** *Essex Naturalist.* Vol. 15. Pages 144-146.

WOOLDRIDGE, S.W and BERDINNER, H.C. 1922, **Notes on the geology of the Langdon Hills, Essex**. *Proceedings of the Geologists' Association.* Vol. 33. Pages 320-323.

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