

Bedfordshire geology

Rocks make landscape, and Bedfordshire's countryside is shaped by many different rocks. The county's visible geological history spans a period of more than 200 million years. It begins in the tropical seas of the Jurassic limestones of the Ouse valley, followed by lagoons where dinosaurs roamed 170 million years ago. The Greensand Ridge was once a shallow seaway, and the high white Chalk hills were deposited at the bottom of a warm blue ocean.

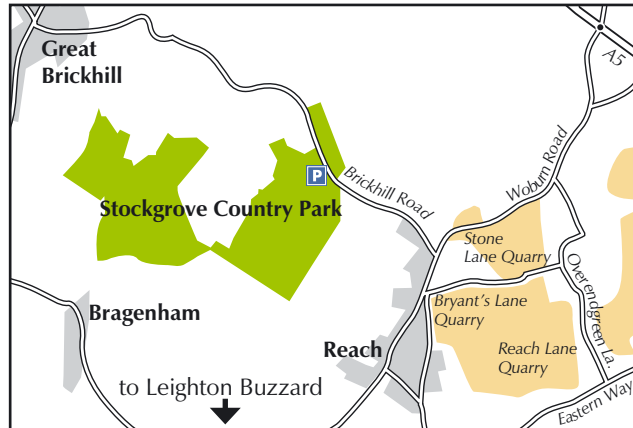
Bedfordshire's amazing geological history is open for you to read; you just have to know where to look! Here's a brief guide to take you back through time to see what frost and ice did to the Greensand Ridge in Stockgrove Country Park.



Based on BGS sheet 220, Leighton Buzzard Solid & Drift
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	Stockgrove Country Park boundary	
	Quarries working or disused	
	Till	
	Glacial Sand and gravel	Quaternary
	Terrace gravels	Today-2.6 million years ago
	Head	
	Alluvium	
	Gault Clay	Cretaceous
	Lower Greensand	65-146 million years ago
	Amptill Clay	Jurassic 146-208 million years ago

Till is the remains of rocks crushed by a glacier as it flowed across the landscape, left behind when the ice melted. Quaternary sands and gravels were eroded out of the till and underlying rocks by rain and meltwater.



Stockgrove Country Park is on Brickhill Road, just under 1km west of Heath & Reach.

The Bedfordshire & Luton Geology Group exists to encourage understanding of the geology and geomorphology of the county and to undertake site recording, interpretation, advice and education

Regionally Important Geological and Geomorphological Sites (RIGS) are places that reveal our geological past and are considered important enough to deserve conservation. They include sites where rocks can be seen (such as quarries and road cuttings) or where the geology or geological processes can be inferred from the shape of the landscape. Official RIGS are recognised by county councils and by Natural England.

For more information about the BLGG and our events as well as the geology and geomorphology of your area visit our website at

www.bedsrigs.org.uk

or contact Chris Andrew c/o Bedford Museum, Castle Lane, Bedford, Bedfordshire MK40 3XD. Tel: 01234 353323; Fax: 01234 273401



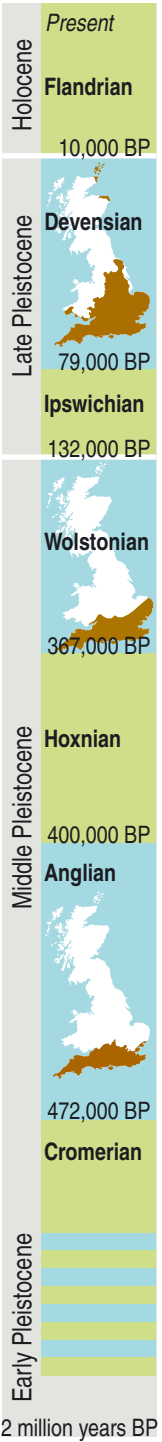
This project was supported by English Nature through Defra's Aggregates Levy Sustainability Fund



A view down the dry valley in Stockgrove Country Park.

Over the last 2.6 million years sheets of ice up to 2km thick crept south across Britain as the climate cooled, melted away as it warmed, only to grow again as the climatic cycles continued. The ice sculpted our landscape and left behind many reminders of its presence.





The Lower Greensand

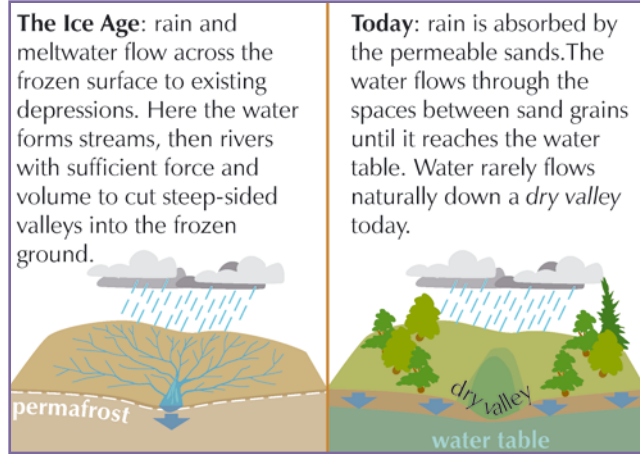
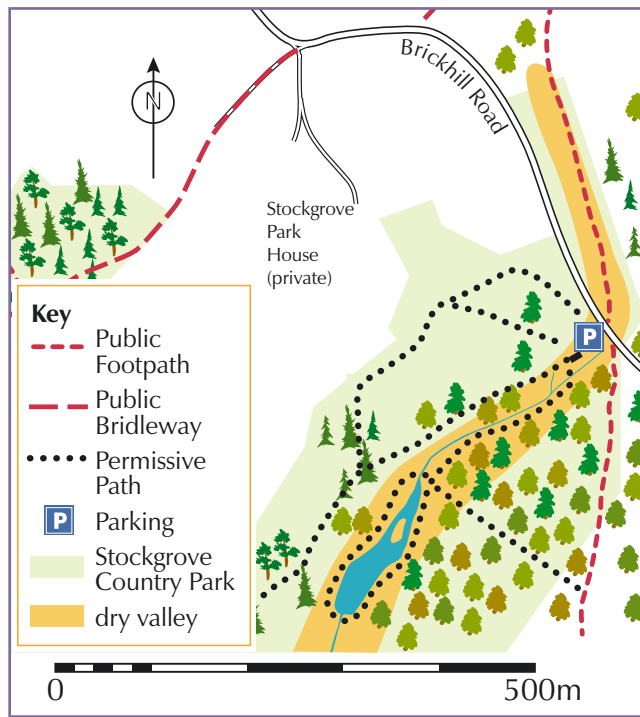
The sandy soils of Stockgrove Country Park are derived from the Lower Greensand, which was laid down in a seaway during the Lower Cretaceous around 100 million years ago. This was an exciting episode in Bedfordshire's geological history: after 40 million years as dry land, the area was suddenly flooded by the sea. The water burst across what is now southern England, forming a narrow channel running southwest from the Wash, across Bedfordshire, and onward to the Isle of Wight.

The flood that created the seaway was part of a world-wide event caused by global warming. Sea-level rose further; the Gault clay that lies above the Lower Greensand was deposited on the floor of a tropical ocean that covered the whole of Britain. After that we don't know what happened in this area until the Ice Age 2 million years ago: 95 million years of geological history is missing, stolen by erosion.

The Ice Age

Till, sand and gravel

Some of the erosion occurred during the Ice Age. Today we're in a warm phase, but during the Anglian most of Britain was covered by a sheet of ice over 2km thick. As the ice flowed across the landscape it carried *till* it had crushed and scraped from underlying rocks. When the ice melted, this till was left behind. The clay and pebble-rich soils on the hills west of the visitor centre are derived from till (telling us ice once covered those hills), and sand and gravel deposited by meltwater flowing away from the ice. Look for the difference: pebbles from the till have relatively sharp corners, while those tumbled in the meltwater streams are more rounded and worn. The map on the inside flap shows you more generally where these deposits lie in the Heath & Reach area.



How dry valleys form in the periglacial (near a glacier) environment. Permafrost is ground that remains frozen all year (to a depth of 600m in Siberia today). The surface may thaw in the summer, but the frozen ground below remains impermeable: water cannot percolate through it.

More Ice Age

Dry Valleys

Dry valleys are often shrouded by mysteries and local legends, but their formation was easily understood once we knew more about past environments. Dry valleys are always found cut into porous rocks such as the Chalk (there's a famous example at Barton Hills) or, as here, sand. Rain falling onto these rocks today, in a warm phase of the Ice Age, soaks away into the rock rather than running over the surface. However, during a cold phase the water in these porous rocks would freeze solid, often to great depths. The ice blocked the gaps between the sand grains (and the pores of the chalk) so, as the ice melted, the meltwater and any rainfall had to flow over the surface. As rivulets and streams united they became strong enough to carve valleys down through the frozen soil; when the cold phase ended, the soil thawed and water once again soaked into the soil. A glacial stream carved the dry valley at Stockgrove sufficiently deep that it cut through the Greensand into the underlying impermeable Jurassic clay (as shown on the map on the inside flap). This meant it was easier for the landscape architects working for the Stockgrove Estate to create the stream and lake we see in the otherwise dry valley today.



Looking northwest up the dry valley north of Brickhill Road.