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 the early Cretaceous period, when dinosaurs walked dry land. Come and see the sandy floor of the shallow seaway that eventually became the Greensand Ridge.

Erosion: here today, gone tomorrow
The very same day sediments or rocks are made, the process of breaking them down (weathering) and taking them somewhere else (erosion) begins. These processes can be seen everywhere on The Pinnacle: the wide valley cut by the Ivel; the sandy slopes on which gravity pulls loose particles downhill, and the wind picking up sand grains and removing them entirely. The extremely rapid erosion here is very unusual in Britain.
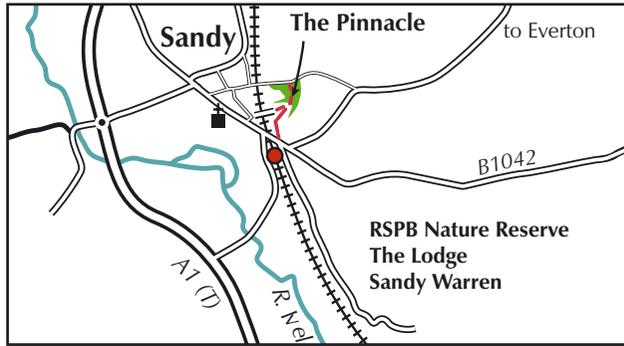
OS grid TL 179490. Two footpaths lead to The Pinnacle from Sandy: a bridleway off the Sandy to Potton road right next to the railway bridge (by Sandy Station); the other leads from the housing estate across the railway line from Cambridge Road. A track unsuitable for vehicles runs past The Pinnacle from the Everton Road.

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

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Bedfordshire & Luton Geology Group

bringing landscape to life
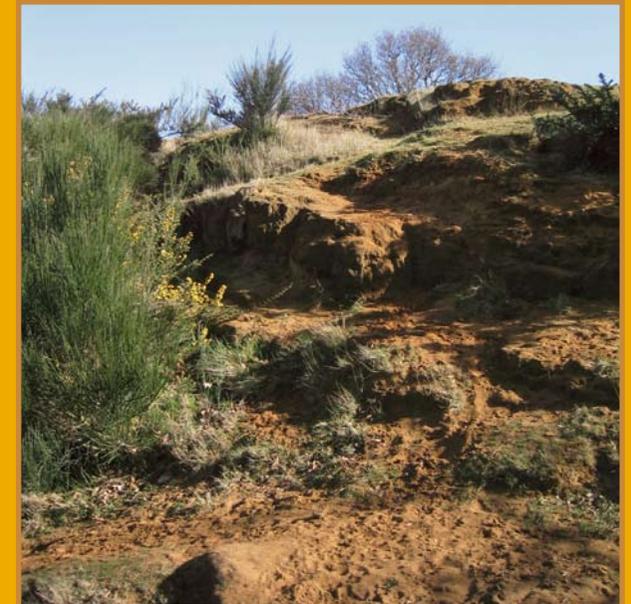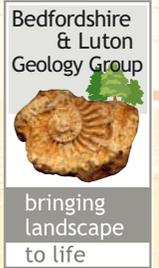
In the Lower Cretaceous, while dinosaurs walked on dry land, Bedfordshire was a sandy shallow seaway. Tides and strong currents moved the sands to and fro, rivers and streams washed tree trunks and branches from the cycad forests into the sea. Nearly 100 million years later, glaciers sculpted the landscape we now live in.

Sandy geology

The town of Sandy sits partly on the eroded base of the Greensand Ridge, and partly on the sediments and glacial gravels of the Ivel valley. The Pinnacle offers an opportunity to view the valley, and to see the Greensand the Ivel cut through to create it.

The Lower Greensand

The Greensand Ridge is an outcrop of the Lower Greensand. These sands were laid down in a seaway around 100 million years ago, a period known as the Lower Cretaceous. 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. This was part of a world-wide event caused by global warming, for sea-level continued to rise and flooded much of the Earth! Bedfordshire's Lower Greensand is unique, because here the estuary of a large river met the Cretaceous sea. The name 'Woburn Sands' marks the difference in the sands and fossils (or lack of fossils) in this area. There are three different sands in the Woburn Sands: the Red Sands, the Silver Sands (exposed here), and the Brown Sands. At Sandy the phosphate pebble bed that marks the base of the Greensand is at the base of the Silver Sands, so the Brown Sands are thin or missing.

The glassy (rather than dull or frosty) surfaces of quartz grains in the Lower Greensand tell us they were moved and polished by flowing water, not blown by the wind.
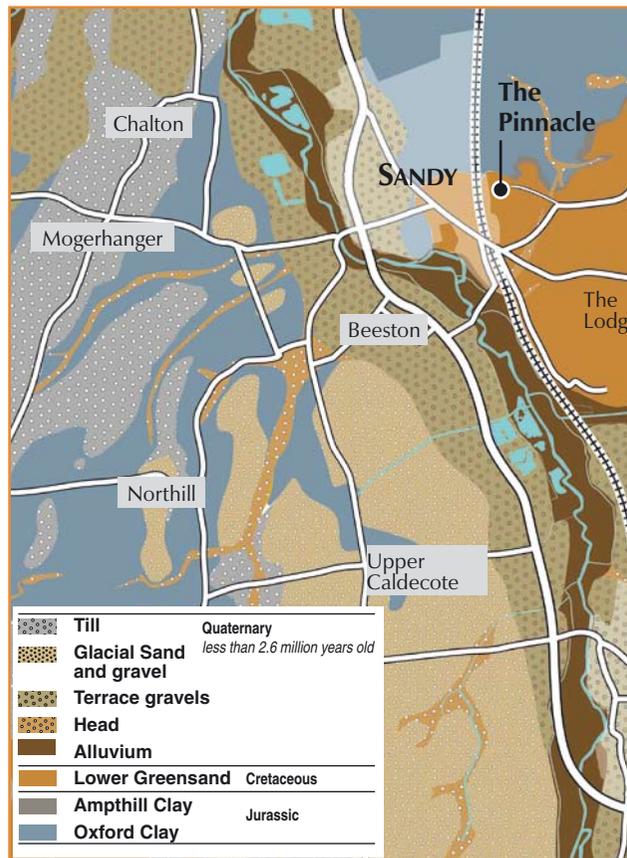
Chalton

Mogerhanger

SANDY

The Pinnacle

Beeston

The Lodge

Northill

Upper Caldecote

	Till	**Quaternary**
	Glacial Sand and gravel	*less than 2.6 million years old*
	Terrace gravels	
	Head	
	Alluvium	
	Lower Greensand	**Cretaceous**
	Ampthill Clay	**Jurassic**
	Oxford Clay	

This view of the path shows the results of erosive forces: the wooden steps intended to decrease erosion caused by people's feet emphasise one of the terraces cut by the Ice Age River Ivel.

The ground rises more gently on the far side of the valley because the Oxford Clay is a softer rock.
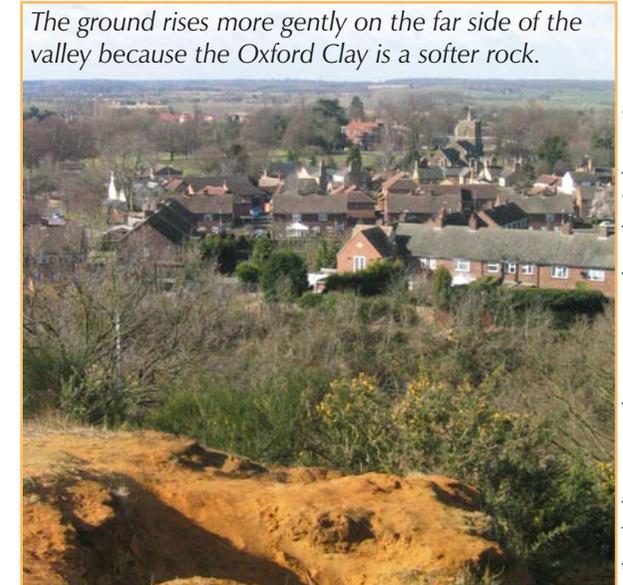
The Ivel and the Ice Age

At Sandy the River Ivel has cut through the sands and sandstones of the Greensand Ridge. On a clear day from the top of the Pinnacle you can see the far side of the valley, where Mogerhanger sits on a layer of till covering the Oxford Clay.[1] Try to imagine this view about 2 million years ago, during the Ice Age. Instead of houses, there would be sand and gravels covering the flat valley floor below you. There would be no trees, just tundra scrub and lichens. About 500,000 years ago an ice sheet advanced, covering Bedfordshire with ice over 2km thick. Then the climate warmed; the Ivel and other Bedfordshire rivers were swollen by meltwater from the ice. The force and volume of its flow allowed the Ivel to cut down through the Greensand in several stages. Each time it did so, it left behind a *terrace* covered with glacial sand and gravel. At times the river's flow and volume dropped, and the Ivel became a *braided river* wandering across a wide valley full of sand and gravel it had brought here from the melting ice sheet. As you walk the footpaths around The Pinnacle, note the sinuous outline of the hillside, a reminder of the sinuous River Ivel that shaped this edge of the ridge.

1. Spare a glance for the steeple of St Swithun, built in sandstone from the Lower Greensand.