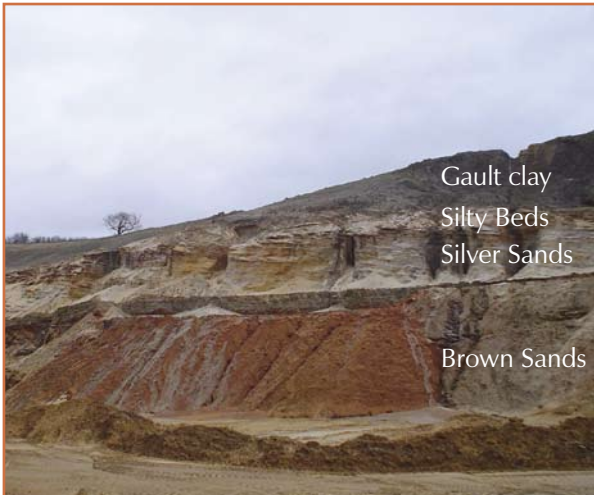


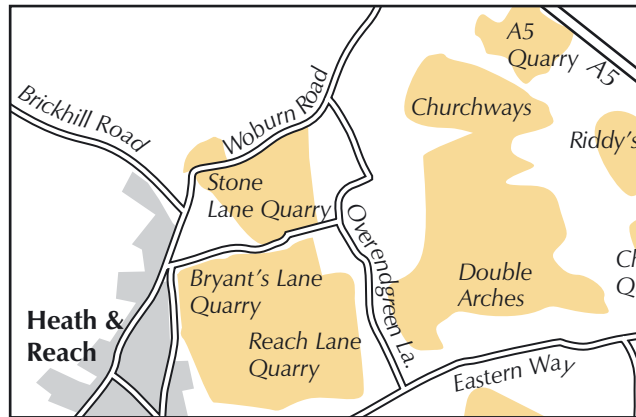
Bedfordshire geology

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.



Stone Lane Quarry has created one of the best cross-sections you will see through the Lower Greensand, including the Silty Beds and the Brown Sands. It's not visible in this image, but by chance the quarry has also revealed a deep channel cut through the Gault that overlies the Greensand. The channel is filled by till created by the grinding action of ice on rock as a glacier passed over this part of Bedfordshire half a million years ago.



Stone Lane Quarry, Heath & Reach, is a working quarry owned by WBB Minerals Ltd. Access is strictly by permission only. The quarry can be viewed from the public footpath running parallel to Woburn 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



Supported by English Nature through Defra's Aggregates Levy Sustainability Fund

Lower Greensand

Stone Lane Quarry



Bedfordshire & Luton Geology Group



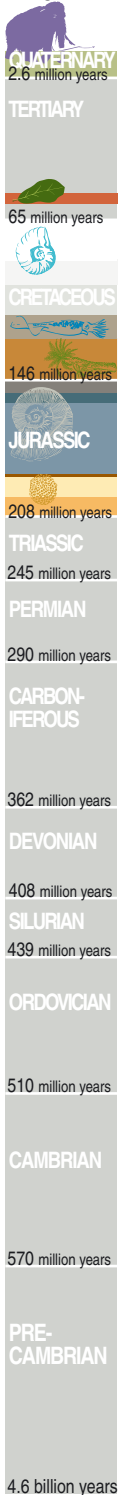
bringing landscape to life



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. Each quarry in Heath & Reach tells another part of the story of the Greensand Ridge.



PRESENT



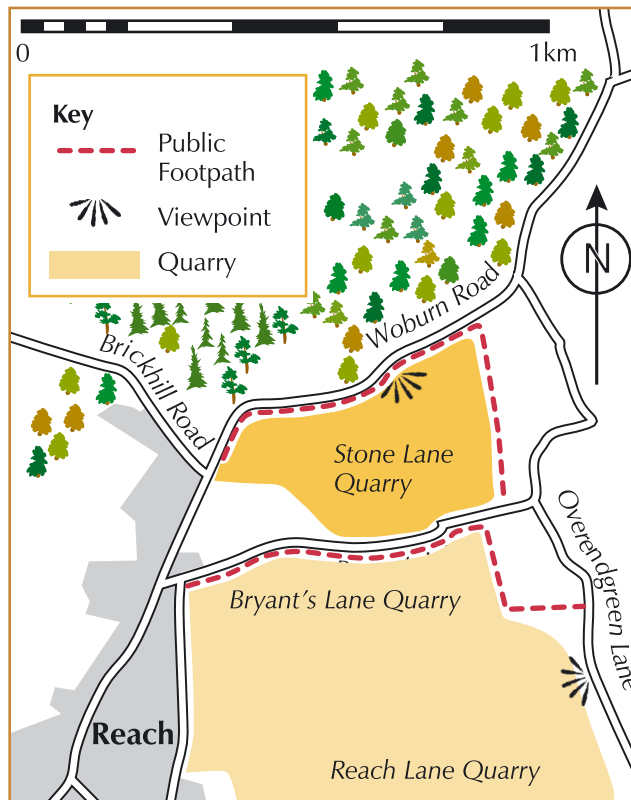
The Lower Greensand

These sands were laid down in a seaway around 100 million years ago, a period known as the Lower Cretaceous. It 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; sea-level continued to rise and flooded much of the Earth!

The quarries of Heath & Reach are among the best places in England to read the story of the flood, preserved in the Lower Greensand.

Stone Lane Quarry shows us three units of Lower Greensand. The lowest, the *Brown Sands*, were laid down in the seaward end of an estuary. They are strongly iron-stained and full of the burrows of shrimp and other animals, which stick out of the sand face like tiny drain pipes, preserved by an inner coating of hard ironstone. Above the Brown Sands are the *Silver Sands*, showing cross-stratification in beds that may be over 1m thick. These were large dunes forming a sand bar at the mouth of the estuary. Above the sands is a unit containing many different thin, flat beds of silts, sands, clays and ironstone. This, the *Silty Beds*, was a tidal flat during the Cretaceous. About 100 million years ago the sand layers were the lower flats, while the muds were deposited in the back lagoons.

Eventually all of Britain lay at the bottom of a warm tropical ocean. The *Gault Clay* tells us something of this, but about 95 million years of the story are missing, eroded by the ice that deposited a thick layer of *till* on top of the Gault. A mix of materials scraped from rocks by the glacier, here the till is almost Gault-grey, but includes pebbles of flint and Chalk, as well as fossils such as *Gryphaea* from the Jurassic Oxford Clay. The fossils are in good condition, so they did not travel far under the glacier.



The *Brown Sands* of Stone Lane Quarry are beautifully patterned by iron-rich minerals moving through the sands.



Till

The **Gault Clay** was deposited at the bottom of a tropical ocean. There are lots of tiny marine fossils in this clay, including ammonites, belemnites (little squid) and bivalve shells.

The **Silty Beds** appear only in the Heath & Reach area.

The **Silver Sands** are pure quartz sands that may be many colours, from pale cream and tan to dark orange. When the iron oxide that holds them together is washed away, the sand grains include clear, quartz, yellow citrine, and mauve amethyst.

These sands are fossilised underwater sand dunes. The cross-stratification we see here was created by layers of sand cascading down the slip face of the dunes. The pattern of layers – parallel or intersecting – tell us about the shape and size of the dunes, and whether they were being built or eroded as the shifting currents took the sands away. There are few if any signs of animals living in the dunes here, probably because the sand was moving too quickly in the tides and currents.

The **Brown Sands** are seen at their best in the Heath & Reach area. They are quite distinctive: look hard at the lower levels of the quarry and you should be able to see the iron-rich patterning. Bring a pair of binoculars!