

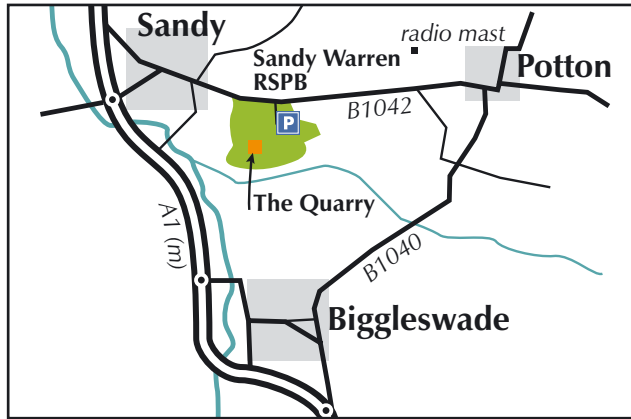
## Bedfordshire geology

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.



The sandstones show laminations, parallel layers that mark slight differences in the sands and sediments. Animals that lived in these sands during the Lower Cretaceous would have burrowed down through the layers, so we'd see their burrows in cross-section today. The holes drilled horizontally into the layers of the cliff face are nests dug by solitary wasps and other modern insects.



Sandy Warren Quarry lies within the RSPB Lodge Reserve. A small charge (payable at the shop) is levied on non-members who wish to visit parts of the reserve not accessible from public rights of way.

**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](http://www.bedsrigs.org.uk)

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## Lower Greensand

# The Lodge Sandy Warren Quarry



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.



PRESENT

QUATERNARY  
2.6 million years

TERTIARY

65 million years

CRETACEOUS

146 million years

JURASSIC

208 million years

TRIASSIC

245 million years

PERMIAN

290 million years

CARBONIFEROUS

362 million years

DEVONIAN

408 million years

SILURIAN

439 million years

ORDOVICIAN

510 million years

CAMBRIAN

570 million years

PRE-CAMBRIAN

4.6 billion years

### Geology at the Lodge

Sitting on the Greensand, with its valuable sands and sandstones, Sandy Warren is surrounded by quarries. Sandy Heath Quarry is still working, but others such as the *coprolite*<sup>1</sup> excavations towards Potton – and two old quarries at the Lodge itself – have been abandoned.

The best of the two quarries on site lies behind the main building; the 'Quarry Trail' leads you past a cliff displaying beds of coarse sandstone that make up a unit called the Lower Greensand.

#### The Lower Greensand

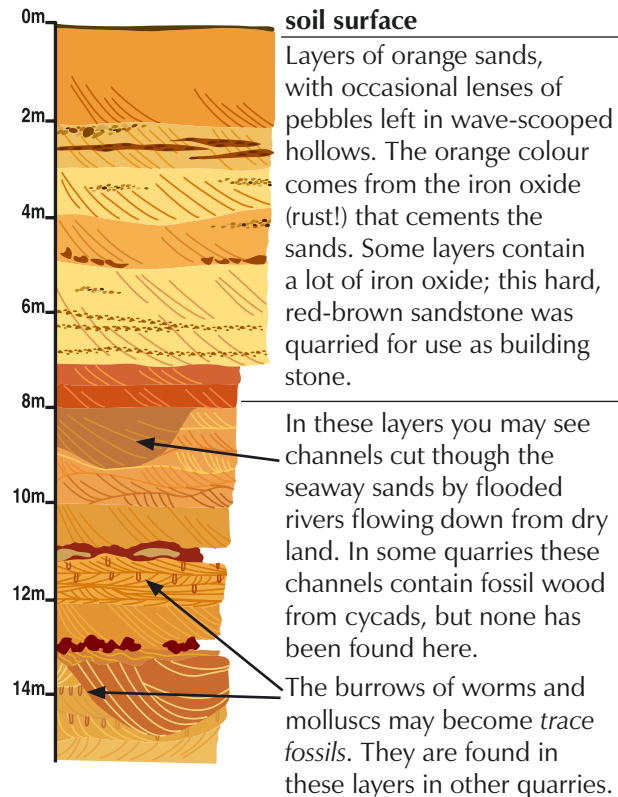
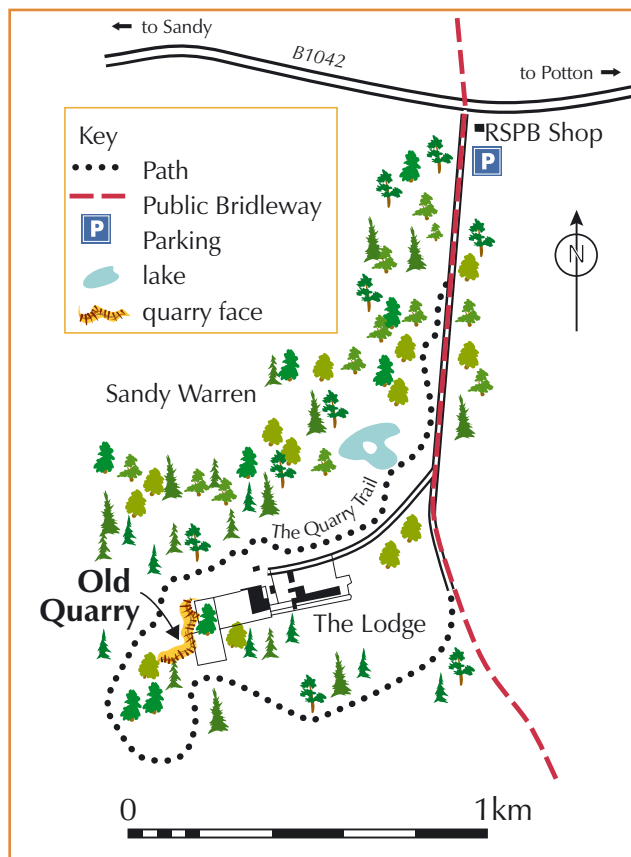
These sands were laid down in a seaway around 100 million years ago, a period known as the Lower Cretaceous. This was an exciting episode in Bedfordshire's geological history: after 40 million years as dry land, the area was suddenly flooded by the sea. The water burst across what is now southern England, 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!

**The evidence of this seaway** can be seen in the rocks of the quarry. Take a closer look:

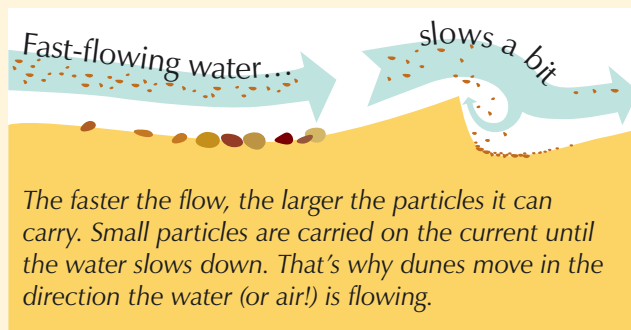
- The glassy (rather than dull or frosty) surfaces of quartz grains in the sands tell us they were moved and polished by flowing water, not blown by the wind.



1. In this part of Britain coprolites are not 'dinosaur dung', but phosphatised nodules. In the late 19th century they were mined and processed to make fertiliser.



- The sands are coarse with pebble horizons (layer boundaries), which means the water was flowing fast.
- No traces of fossils have been seen here (yet). This suggests that the sands built up so quickly that there was no time for seaworms or molluscs to settle.



- The beds are fairly large (a metre or so of height is visible today) indicating sizable dunes (formed by flowing water, rather than flowing air). Changing currents levelled the top of old dunes as they created new ones.
- Most of the *cross-stratification* (lines created in the sands by moving water) tell us that the water was flowing from south to north when these sands were deposited.
- Some cross-stratification indicates currents flowing to the south, so we know the channel was tidal at times.
- Occasional cross-stratification to the west indicates sinuous dunes.