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

CARBON-IFEROUS
362 million years

DEVONIAN
408 million years

SILURIAN
439 million years

ORDOVICIAN
510 million years

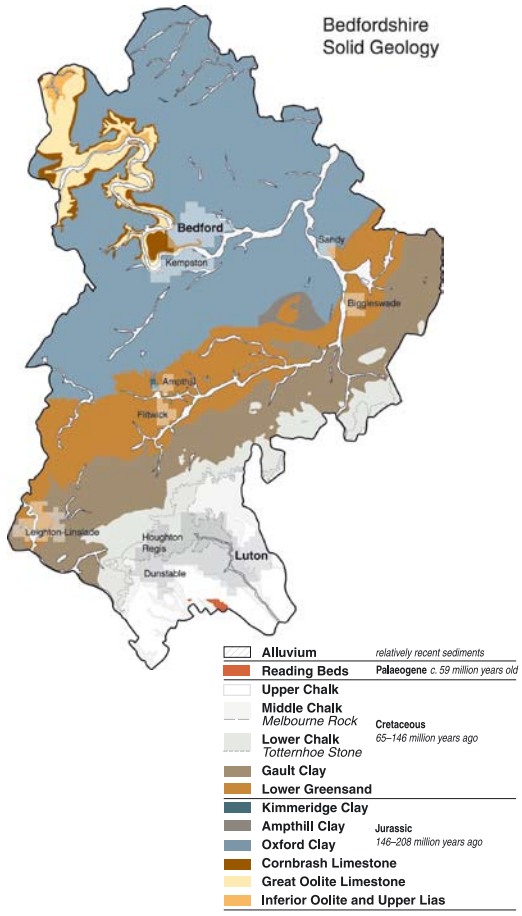
CAMBRIAN
570 million years

PRE-CAMBRIAN
4.6 billion years

Bedfordshire's Jurassic Park

The rocks of Bedfordshire date from the early Jurassic to the Tertiary Period, about 190 to 40 million years ago. (The rocks laid down during the late Cretaceous and Tertiary are missing in our area, worn away by time and the glaciers of the Ice Age) All these rocks are made from many layers of sediments – limestones, clays and sands.

For various reasons (including the wrinkling caused by Africa colliding with Europe) England actually tilts slightly down to the southeast. This means that older rocks are closer to the surface in northwest Bedfordshire. So it's not surprising that this is where we find the county's oldest rocks: the Jurassic limestones.



The Bedfordshire & Luton Geology Group

We exist to encourage understanding of the geology and geomorphology of the county and to undertake site recording, interpretation, advice and education. We aim to:

- Protect local geological and geomorphological sites
- Encourage public enjoyment of rocks, fossils and landscape
- Encourage the use of RIGS* sites by the public, by schools and local groups
- Keep a listing of RIGS sites in Bedfordshire
- Provide information for potential users of sites
- Encourage landowners to participate in the scheme
- Involve landowners and users of RIGS in good practice and management

What are RIGS?

Regionally Important Geological and Geomorphological Sites, 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. Even buildings made of local stone can be RIGS! Official RIGS are recognised by county councils and by Natural England (the statutory nature conservation body of England).

How to contact us

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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Jurassic Limestones

Bedfordshire & Luton Geology Group

bringing landscape to life

The Ouse Valley and the limestone spire of St Peter's, Harrold.

Bedfordshire's Jurassic Park was an ocean!

At some times the water was warm and shallow, at others it was cold and deep, but it was always full of life. From Jurassic oysters and coral reefs to giant marine reptiles, their remains survive in the limestone and clays beneath our feet.

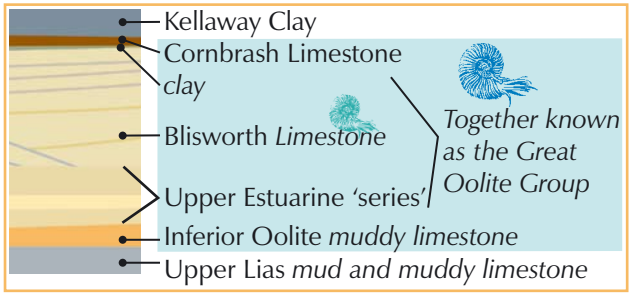
Jurassic Bedfordshire: welcome to the Bahamas!

During the Bathonian Stage of the Jurassic Period (170 million years ago) Bedfordshire was much closer to the equator, with a warmer climate than today. The County was covered with a shallow, warm, tropical sea, an environment just like the modern Bahamas.

All Bedfordshire's Jurassic rocks are marine, so this was an underwater 'park' full of ammonites and other molluscs, fish, and marine reptiles instead of dinosaurs and other land animals. However, signs of dry land have been found in parts of Buckinghamshire and Oxfordshire, with dinosaur trackways (such as at Ardley) and bones (e.g. Woodeaton Quarry).

This leaflet deals with the limestones formed in relatively shallow water early in the Jurassic; for information on the rest of the period – the Oxford, Ampthill and Kimmeridge clays – see the Marston Vale leaflet or our website *www.bedsrigs.org.uk*

Bedfordshire's Jurassic Limestones.
Not all are visible in surface exposures; some are seen only in the cores from boreholes.



The **Upper Lias** is the oldest of Bedfordshire's rocks. This series of silty muds and muddy limestones was laid down around 190 million years ago in a sea teeming with life including fish, belemnites and ammonites.

Dactylioceras, a Liassic ammonite.

Dapedius, a Liassic fish

The top of the Upper Lias is weathered (which tells us it was exposed to the air), and some is missing, eroded away.

The **Inferior Oolite** above the Upper Lias is about 175 million years old and contains marine shells as well as *ooliths* – tiny round balls of calcium carbonate (calcite). Ooliths are important. They tell us that the sea was warm and shallow (about 5 to 10m deep) with gentle waves that rolled tiny particles such as shell or sand to and fro to build up an even coat of calcite in many thin layers, as is happening in the Bahamas today. The Inferior Oolite is also fairly muddy, telling us that land was not too far away. The mud means this is a poor building stone, so this stone is rarely quarried.

The **Great Oolite**, the next rock in the sequence, has much less mud, is well-cemented and makes a good building stone. Ammonites, bivalve shells and sea urchins are common fossils in this rock. The Great Oolite surfaces in a thin strip of land on the valley sides of the River Ouse between Bromham, Oakley, Pavenham and Milton Ernest and also along the section starting at Harrold and south to Chellington. It is this rock that gives the pretty villages of Harrold, Odell, Pavenham and Stevington their character.

The last of the limestones is the **Cornbrash**. This sequence of thin, rubbly limestones is very different to the other limestones because it contains smashed-up shells giving the rock a very rough and gritty texture. It occasionally provided roof tiles in Roman times, but is not used for buildings today. However, it does make a fertile, well-drained soil, hence *corn brash*: a place where good corn is grown!

The Cornbrash is a pale brown or sometimes bluish-grey rock, gritty and full of broken shells.

Where can you see Jurassic limestone?

Today there are no working quarries or partially exposed old pits. The only place to see the limestone is in Ouse Valley buildings made of local stone.

*First mentioned in 1224, **Bromham Bridge** (TL011507, above and below) was extensively altered in 1813 and 1902, it is largely built of typical Great Oolite limestone. Much of the stone is fossiliferous, containing bivalve shells. Look for* cross-stratification, *lines in the stone marking the fossilised slip-faces of small underwater sand dunes. They always slope down in the direction of flow.*

Harrold (below), Odell and Pavenham contain many buildings of local limestone. Much was cut by hand; toolmarks can still be seen on many of the stones.