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

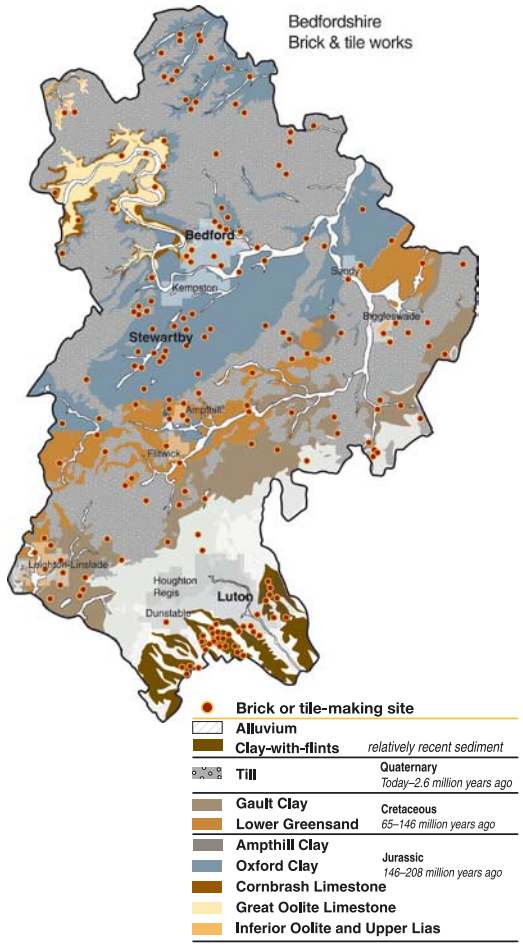
CAMBRIAN
570 million years

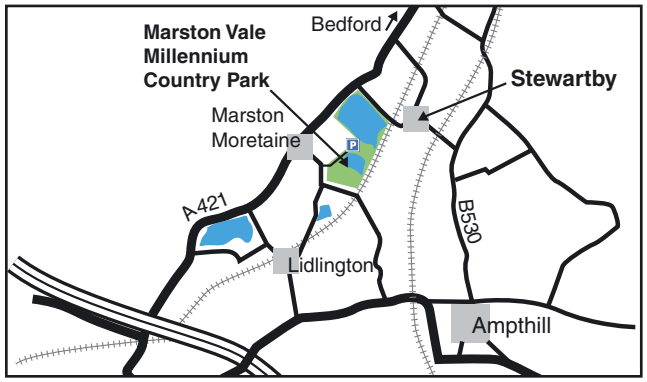
PRE-CAMBRIAN
4.6 billion years

Bedfordshire meant bricks!

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.

During the Jurassic and Cretaceous periods Bedfordshire was under the ocean at the latitude of the modern Bahamas. The *fletton* bricks in so many British houses were made from the muddy floor of the Jurassic ocean.





When Stewartby closes, the nearest brickworks will be at Peterborough. But you can still investigate the brick industry in Bedfordshire! A walk along a city street reveals a wealth of bricks in different styles and colours. Stewartby remains as a memorial to the industry, and the old brick pits at nearby Marston Vale Millennium Country Park are a useful resource for wildlife and people.

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

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Tel: 01234 353323; Fax: 01234 273401

Heritage Lottery Fund

Local Heritage *initiative*

Bedfordshire's geological industries

Brickmaking

Bedfordshire & Luton Geology Group

bringing landscape to life

Photo courtesy of Beds County Record Office

In 1897 BJ Forder & Son opened a new brickworks at Wootton Pillinge. In 1936 Stewartby (as it was now known) was the largest brickworks in the world.

The Cretaceous and Jurassic seas left Bedfordshire one of its most valuable legacies: clay! The brickpits of the Marston Vale supplied the raw materials for many British houses.

There are more ways to make a brick…

People have made bricks for nearly 10,000 years, beginning with moulded clay baked in the sun. Fired bricks appeared *c*. 5,000 years ago in the Middle East.

Almost any clay can be used to make bricks (or tiles). Brickmakers add sand or other materials as necessary to create strong bricks and reduce shrinkage and cracking. ***Alluvial* clays** (sorted and deposited by water relatively recently) are easier to access than deep formations such as the **Oxford clay**. The **Gault Clay** and **Kimmeridge Clay** were used, as was the '**brickearth**' associated with weathering of the Chalk near Luton and Caddington.

Most modern bricks are made by mixing several clays with water and other materials to create a blend that will give the desired characteristics. About 65% of bricks are *extruded*, forced through a die to form a column of raw brick *wirecut* into slices. The 'soft mud' process presses the mix into sand-lined single brick moulds, and accounts for another 20% of production.

Unfired or *green* bricks are dried before firing. Most travel on carts through continuous feed 'tunnel kilns', although some are still fired in batch kilns. At 900–1100°C (depending on the clay) *vitrification* occurs: the sand and other minerals in the clay fuse together to create hard, weather-resistant bricks.

Bedfordshire bricks through the centuries

Only fired bricks were of use to the Romans in Britain – mud bricks would have softened in the rain! Each Roman legion had a stamp to identify products from its portable kilns. Bricks would also have been fired in temporary kilns and purpose-built structures: nine kilns at Harrold produced both pottery and tiles.

The Saxons built with timber. Fired floor tiles are rare before the 13th century and are found together with re-used Roman brick and tile in high-status buildings such as churches. The earliest post-Roman bricks are 12th century, but The Someries (near Luton) built *c*. 1448 is still one of the oldest brick buildings in Britain.

Roman bricks were larger and flatter than modern bricks. This fragment still retains some mortar.

Early medieval brickwork in The Someries

In the 16th century a brick-making industry developed near Luton, but elsewhere small claypits opened and closed according to local demand. In 1850 the Brick Tax imposed in 1784 to meet some of the costs of the American War of Independence was repealed. By this time most parishes had their own claypits and brick became a popular building material especially in areas without local building stone.

In 1881 the *Fletton Process* revolutionised the brick industry. In 1899 the London Brick Company (founded in Fletton, near Peterborough) began to buy brickworks and land on the Oxford Clay near Wootton Pillinge. At about the same time BJH Forder & Company, originally a small brickworks on the Gault at Westoning, expanded to work the Oxford Clay at Elstow. Forder was bought by Halley Stewart who, with others, transformed it into a public company. In 1923 the London Brick Company merged with BJH Forder and Company under Halley Stewart and then his son Percy. The London Brick Company built a village for its workers at Wootton Pillinge, which after Stewart's death in 1936 was merged with Wootton Broadmead and part of Kempston and named Stewartby in his honour. Business continued to improve: workers from Italy, Pakistan and India were recruited to raise production to supply the post-WWII building boom.

Since the 1960s brickmaking has become less profitable. Smaller houses require fewer bricks; the use of concrete block, timber, glass, and steel is increasing. Combined with sulphur pollution from the firing, the decline will lead to the closure of the Stewartby works in 2008.

Some Bedfordshire bricks

Flettons: Also known as 'commons', flettons dominated the British brick industry for almost a century. The *Fletton Process* relies on the character of the Lower Oxford Clay, which can be forced into brick moulds straight from the pit and contains 5% lignite, sufficient to supply 75% of the energy needed to fire the bricks. The green bricks are sealed in the kiln and dried in the heat of a previous firing before spending 30 hours at 930–960°C. The production cycle takes about 10 days. Flettons are porous bricks unable to bear high stress and unsuitable for external use, but much used for internal walls or those to be rendered.

Flettons are made in a variety of styles.

Arlesey Whites: The Arlesey Brick & Lime Co. Ltd worked the Gault Clay from about 1858 until it was taken over by the London Brick Company in 1928. A tramway carried clay from the main quarry (now the water-filled Blue Lagoon) to a brickworks stretching nearly half a mile along the tracks of what was then the Great Northern Railway in Arlesey. The 'Arlesey White' with 21 perforations allowing even firing to create a very hard brick was patented in 1878. Later that century Robert Beart revolutionised production of the bricks by using mechanical presses to force the clay into moulds previously filled with wet puddled clay. Pressed bricks were drier and could be fired more quickly. At one time there were six brickworks in Arlesey; today only the pits remain.

Luton Greys and Reds: The Luton *brickearth* is associated with hollows created by water dissolving the Chalk, probably during the Pliocene. The production of Luton 'greys' was a significant industry from the mid-1800s to the 1930s.