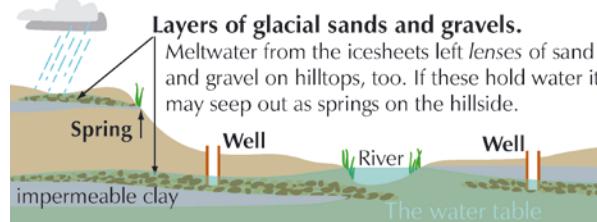


## The Ice Age in Bedfordshire

The rivers of Bedfordshire – the Great Ouse, the Ouzel, the Flit, Lea, the Ivel and others – flow in sinuous valleys carved through lush meadows and farmland. The geology of the valley floors is dominated by the sands and gravels that the waters have deposited there during and since the Ice Age. The sands and gravels in Bedfordshire river valleys are relatively thin, never more than 5m thick and often much less. This means they have limited (often only local) economic significance, but they can be very useful in a different way. Because they are highly permeable, sands and gravels can be aquifers, storing water underground for us to use.



### Why quarry aggregates?

Aggregates (sand and gravel) are the foundation of all our building and civil engineering: look closely at the world around you and you'll see aggregates everywhere, from toothpaste through windows and walls, to the roads and railways we travel every day. Without aggregates our comfortable modern life would not exist.

- Over 250 million tonnes of aggregate are quarried each year in the UK – a 20-tonne truck load for every family in the UK!
- The average quarry life span is 30 years (rock), 5–10 years (aggregate).
- 185,000 new homes are built annually, each using 50–60 tonnes of aggregate.
- The cost of aggregate doubles for every 30 miles it travels, so every area needs a local source.

## 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

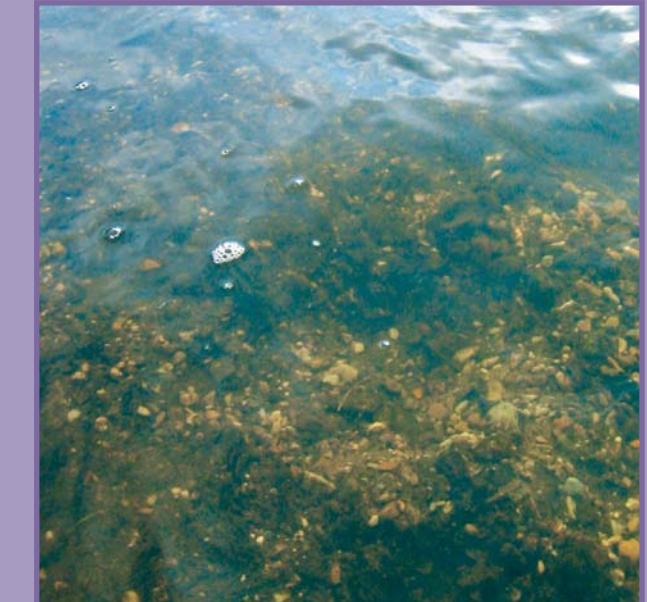
[www.bedsrigs.org.uk](http://www.bedsrigs.org.uk)

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

# Ice Age Sand and Gravel the basics



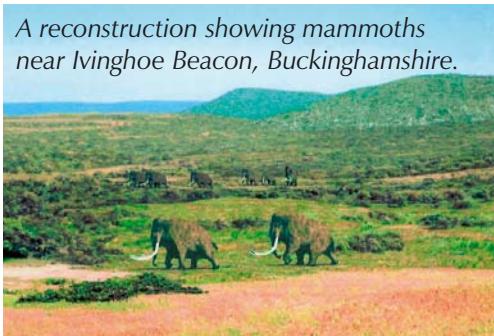
Gravels in the River Ivel near Biggleswade.

Over the last 2.6 million years sheets of ice up to 2km thick crept south across Britain as the climate cooled, melted away as it warmed, only to grow again as the climatic cycles continued. The ice sculpted our landscape and left behind many reminders of its presence, including beds of sands and gravels in our river valleys.

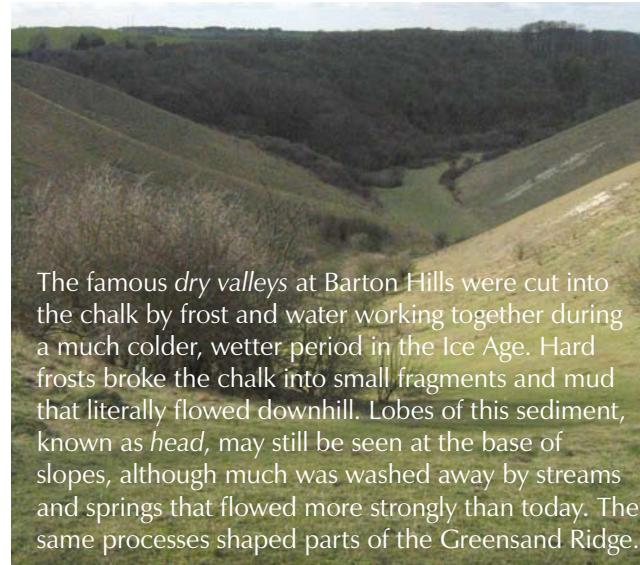


Present	<b>The Ice Age</b>
Flandrian 10,000 BP	
Devensian 79,000 BP	
Late Pleistocene Ipswichian 132,000 BP	
Wolstonian 367,000 BP	
Middle Pleistocene Hoxnian 400,000 BP	
Anglian 472,000 BP	
Cromerian 2 million years BP	

**The Ice Age**  
The Ice Age, which covers the last 2.6 million years of our history, has been one of extreme climatic variation. During this time the landscape was sculpted to its present form. Before the Ice Age Bedfordshire was a very different place – none of the present river valleys existed, and there was no Chalk escarpment or Greensand Ridge. Even during the Ice Age there were tremendous differences in the vegetation and animal life present, depending on whether it was a cold phase or a warmer interglacial. In the Anglian period most of the county was covered by an ice sheet over 2km thick; after it melted, early man may have hunted elephants and giant deer here. Later, during the Devensian, mammoths browsed trees and shrubs in Bedfordshire.



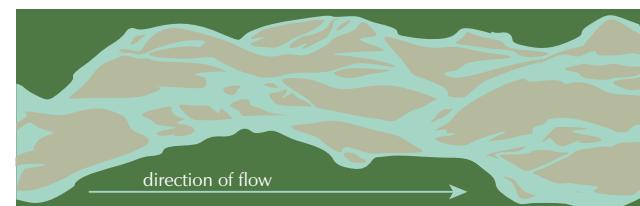
We know that the Anglian ice sheet ground its way across Britain because it left behind a layer of *till* covering much of the county. Till is a clay containing pebbles and sand, the ground-up, crushed fragments scraped from many different rocks as the ice flowed over them. Bedfordshire till includes a lot of chalk, flint, ironstone, quartz pebbles and even some igneous rock from Scandinavia! This tells geologists that the ice travelled southwest from Scandinavia across the North Sea and the chalk of Norfolk and Cambridgeshire before it reached this area.



The famous *dry valleys* at Barton Hills were cut into the chalk by frost and water working together during a much colder, wetter period in the Ice Age. Hard frosts broke the chalk into small fragments and mud that literally flowed downhill. Lobes of this sediment, known as *head*, may still be seen at the base of slopes, although much was washed away by streams and springs that flowed more strongly than today. The same processes shaped parts of the Greensand Ridge.

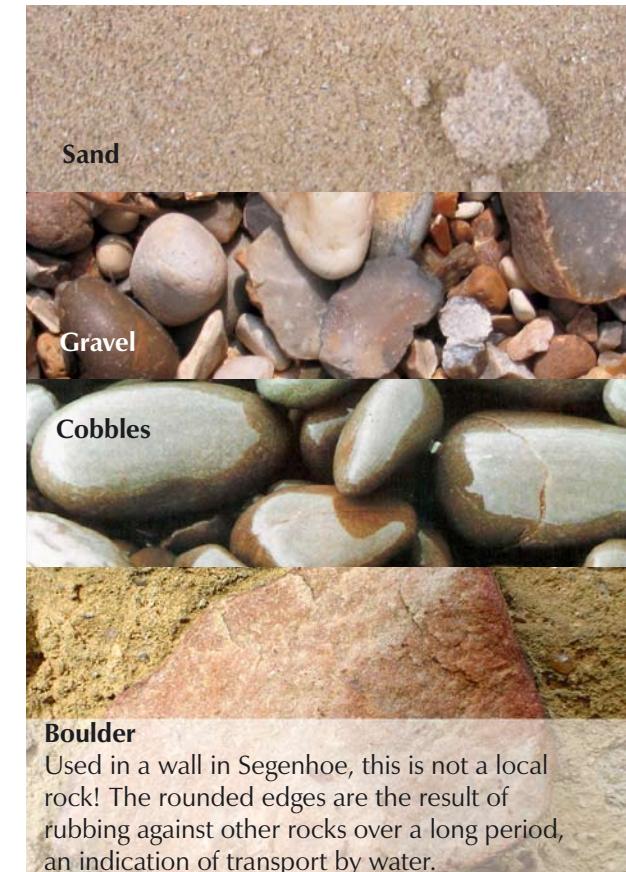
Ice can dramatically change landscapes. For instance, ice lobes and glacial streams cut the escarpment at the Lea Gap at Luton. The River Ouzel seems too small for its valley, and it is – the valley was *overdeepened*, eroded by flowing water trapped beneath an ice sheet. Very finely laminated clays were deposited in large lakes formed at the front of the ice sheet; today structures built on these clays must have special foundations.

Britain is currently enjoying a warm interglacial, and our rivers are all meandering rivers, cutting sinuous valleys. The meltwater from the Anglian ice sheet rushed away in *braided streams* carrying vast quantities of sediment. (Today the only braided river in the UK is Glen Feshie in the Cairngorms.) The channels of braided streams shift constantly across the *unconsolidated* (loose) deposits; some of these channels are preserved in the sediments filling Bedfordshire's river valleys.



A braided stream fills its valley with shifting bars of sand and gravel.

There are all grades of deposit within Bedfordshire's ancient valleys: clays, silts, sands, gravels, cobbles and boulders. Clays and silts are both very fine sediments, but silt is slightly coarser – some geologists distinguish them by rubbing samples on their teeth: if it feels slightly gritty, it's silt; if it's smooth, it's clay.



#### Boulder

Used in a wall in Segenhoe, this is not a local rock! The rounded edges are the result of rubbing against other rocks over a long period, an indication of transport by water.

Palaeolithic handaxes that may date from the Hoxnian and mammoth teeth from the Devensian are found in Bedfordshire's river gravels.



handaxe



mammoth tooth