

Local Geological Sites (LGS)

LGS are recognised for their local geological diversity and earth heritage value. The East Pit at Cherry Hinton was designated an LGS for a number of reasons. It is a fine exposure of the Cretaceous Grey and White Chalk boundary in the area and is probably the best place in the county where the Melbourn Rock and Plenus Marl horizons can be viewed. The site is one of three disused chalk quarries in Cherry Hinton, the others being West Pit and Lime Kiln Close (all three are now nature reserves).

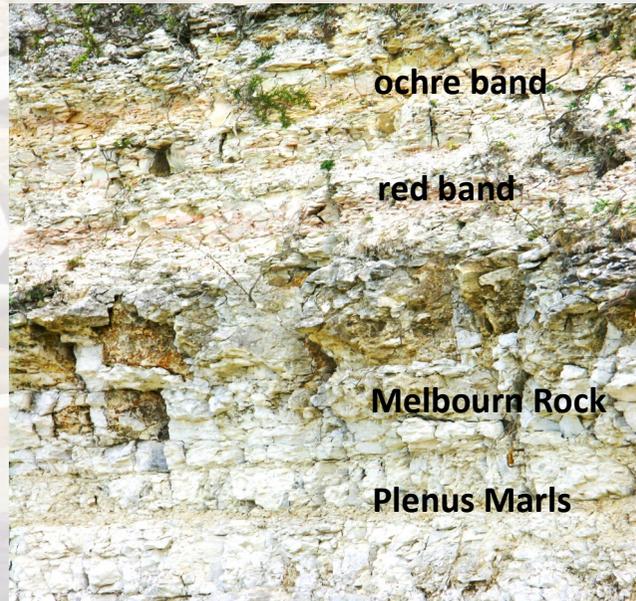
East Pit is an important historical site. The rock was quarried mostly for building stone - much of it used in the University college buildings and some being used for agricultural quicklime or cement. Excavations have revealed a significant Iron Age settlement was located here. It is now an important Local Nature Reserve (LNR) and a Site of Special Scientific Interest (SSSI) for its biological value as it is rich in rare chalk-loving flora such as the Moon Carrot. It is owned by the Wildlife Trust for Beds, Cambs and Northants and managed for its conservation and education value.

The Landscape

East Pit is on the eastern edge of the Cam River Valley, on the slopes of the Gog Magog Hills, south of Cambridge. The higher ground is dominated by Chalk hills, but to the north west, river terraces and alluvium cover the chalk and other bedrock. The chalk escarpment forms an arc around the south east Fen Edge. A series of springs, including the nearby Giant's Grave, emanate from within it, at the level of the Totternhoe Stone, which lies at the base of the Cherry Hinton pits (see our leaflet on Nine Wells).

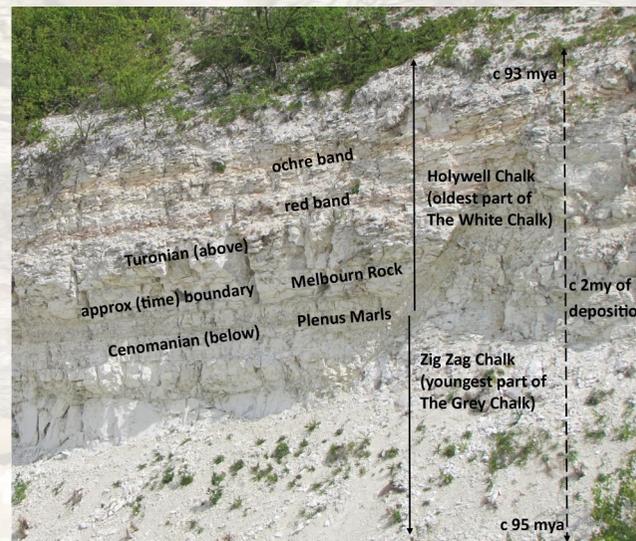
The Stratigraphy

Chalk is a limestone formed from the calcareous skeletons of the pelagic coccolithophores (algae) which flourished in the very warm seas covering this



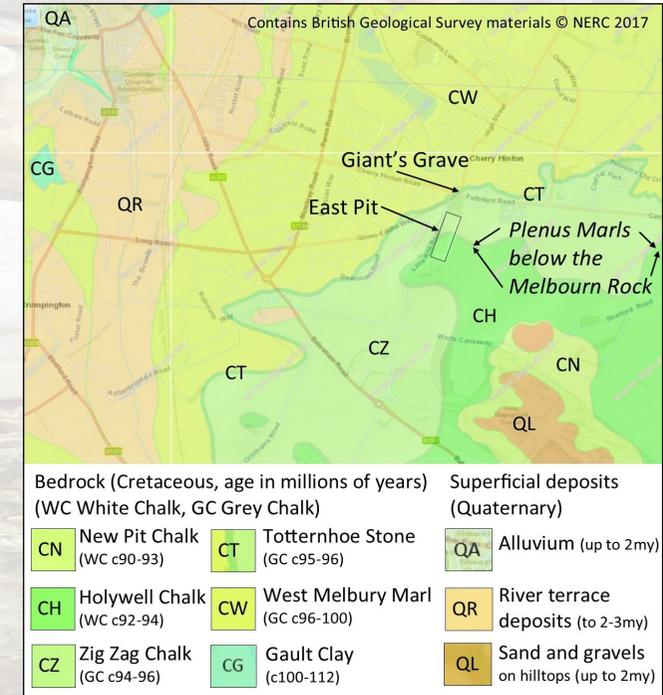
Close up of coloured bands in upper section of cliff.

area in the mid Cretaceous. Fossil shells of other sea animals (bivalves, brachiopods etc) can be found in the loose blocks by the side of the paths. It is thought that the succession making up the cliff was deposited over about 2 million years from the late Cenomanian



Geological succession overlain on cliff face (adapted from P.Friend)

to early Turonian stages (about 95 to 93 mya) of the Cretaceous period. Most of the layers of the Chalk are very similar to the naked eye but close study shows that they contain distinctive fossils that date them and show they formed during differing environmental conditions.



Geology map showing East Pit in relation to the Chalk succession and river valley deposits to the NW

The lowest beds visible, at the base of the cliffs, are the Zig Zag Chalk (the top 'layer' of the Grey Chalk, previously called the Lower Chalk). These are overlain by a band termed Chalk Marls (the Plenus Marls), that contains more clay minerals, making it slightly softer than the purer chalk rock (the White Chalk) higher up. There is a harder band about halfway up the cliff, termed the Melbourn Rock which shows some signs of bioturbation (trace fossils eg worm and crustacean burrows). Above these are some evident yellow/ochre and red bands cutting across the cliff faces (in the Holywell Nodular Chalk) showing the gradual dip (slope) of the beds.

Structure of the beds

The beds are shallowly dipping towards the rear of the quarry (SE), but some variation in this can be deciphered by following the trends of the red and ochre tinted beds about 2/3rds of the way up the eastern quarry face. Looking in detail, some minor faulting is shown up by their relative displacement along steeply angled slip planes. Due to its uniform and soft nature, faulting is difficult to see in Chalk.



Trace fossil in
Melbourn Rock

Terebratulid brachiopod
from East Pit

A clue to the past

Two particular horizons (Plenus Marls and Melbourn Rock) can be correlated with other local Chalk deposits across wider areas of the Chalk Group in eastern and southern England extending across the London-Paris Basin (and further afield).

Isotopic evidence from the English Chalk, as well as from limestone deposits elsewhere in the world suggests there was a period of extensive deposition of organic carbon in many parts of the ocean near the Cenomanian/Turonian boundary. One of the possible causes was widespread depletion of oxygen (known as an Oceanic Anoxic Event, OAE). This boundary coincides with deposition of the Plenus Marls layer of the Chalk, identifiable at this site, and potentially links the deposits here to a regional, if not worldwide, event connected with rising sea-levels and a significant extinction event.

Generally the Chalk was deposited in sea temperatures of over 20° with a CO₂ rich atmosphere causing dense marine algal blooms.



East Pit is accessed on foot from Lime Kiln Road. The closest parking is in Cherry Hinton Road near the pub.

The site is open to the public and a footpath gives access to much of the quarry. Stairs climb up onto some higher platforms where good views of the cliffs can be gained. To visit, check the [Wildlife Trust](http://www.wildlifebcn.org/reserves/cherry-hinton) information (www.wildlifebcn.org/reserves/cherry-hinton). **Note access and safety information on site. NB Access to the cliffs or areas near to the cliffs is not allowed due to safety risks. Permission to look more closely at them (than the paths allow) must be obtained from the Wildlife Trust.**

Also known as Geosites (previously, Regionally Important Geological Sites), LGS are the most important sites of local geoconservation value. Further information on LGS and the geology of Cambridgeshire can be found on the [CGS website](http://www.cambsgeology.org).

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East Pit Cherry Hinton Cambridgeshire Local Geological Site

