

CHALK IN THE EAST OF ENGLAND

The Chalk of the East of England was deposited in warm seas of Late Cretaceous time, between 100 and 70 million years ago. The name Cretaceous comes from the Latin for Chalk.

The western edge of the Chalk is a fairly steep escarpment slope in the Chilterns, becoming lower and gentler – being worn down during the Ice Age – before reaching the north-west coast of Norfolk. The Chalk layers tilt south-eastwards and eastwards and are over 400m thick in north-east Norfolk. Its surface is mostly covered by later deposits in the east of the region.

The oldest Chalk occurs (at the surface) in the west of the area and, because of the tilt (or dip), the youngest in the east. A succession of fossils and in some places bands of flint nodules enable the Chalk to be divided into a number of intervals allowing us to read the 'history' of that geological time. Of particular interest are changes in sediment conditions about 84 million years ago, caused by the African tectonic plate rotating into the European plate.

Variable conditions in the sea gave rise to a variety of Chalks. There is more clay in the older parts of the Chalk and marl (chalk-clay) seams are characteristic. 'Hardgrounds' are local features recording where the sediment surface was cemented during a period of non-deposition.

Chalk preserves beautiful fossils of many forms of Cretaceous sea-life – sponges, shells, sea-urchins, and the last ammonites before they became extinct. Fossil barnacles in the Chalk were studied by Charles Darwin. Remains of washed-in land animals are very rare, but a find in Hertfordshire shows that Hadrosaurs (duck-billed dinosaurs) were living on the land.

Water sinks into bare Chalk and travels underground via fissures to give an excellent supply of clean water. This means the surface of the Chalk is generally quite dry and forms a characteristic 'downland' landscape with intermittent streams and dry valleys. Springs occur where water emerges from the base of the Chalk.

Chalk has been used for building purposes for centuries, both as 'clunch' (such as the Totternhoe Stone) for a building stone and also for the manufacture of lime and, more recently, of Portland Cement.

SAFETY

Geo-East takes safety seriously

- Cliffs and quarry faces are unstable and liable to collapse at any time; keep away from them and be aware of falling material.
- Be aware of tides when on the coast. Low tide is the best time to visit beaches.
- Be aware that water is potentially dangerous and stay away from lakes and the sea.
- Follow the countryside code see - www.countrysideaccess.gov.uk
- Keep to public footpaths and do not go onto private property.
- Be aware of uneven ground and trip hazards.
- Wear appropriate clothing for the locality and time of year.
- If taking dogs, please keep them under control.



Chalk in Hunstanton Cliff, Norfolk
Photo © Jenny Gladstone

Further Information

Chalk East is an East of England Geodiversity Partnership (Geo-East) project. The aim of the project is to raise public awareness of Chalk geodiversity and landscape in the East of England Region, through its links with biodiversity, culture, industrial heritage and economic activity. To find out more see www.geo-east.org.uk Geo-East wishes to acknowledge the financial support of Natural England.



CHALK IN THE EAST

Explore the Chalk landscape of Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk and Suffolk



Hunstanton Cliff, Norfolk
Photo © Jenny Gladstone



Photo © Mike Sandison

CHAFFORD GORGES NATURE PARK, ESSEX

The Nature Park is in large disused Chalk quarries and shows superb exposures of Chalk in the Purfleet Anticline. Earth movements have brought this upfold in the Chalk close to the surface here. The park has a good Chalk flora, including many species of orchids. This is an Essex Wildlife Trust reserve (TQ 597795) near the Lakeside shopping centre in Grays. Free admission and visitor centre, see www.essexwt.org.uk



Photo © Caroline Markham

SUFFOLK

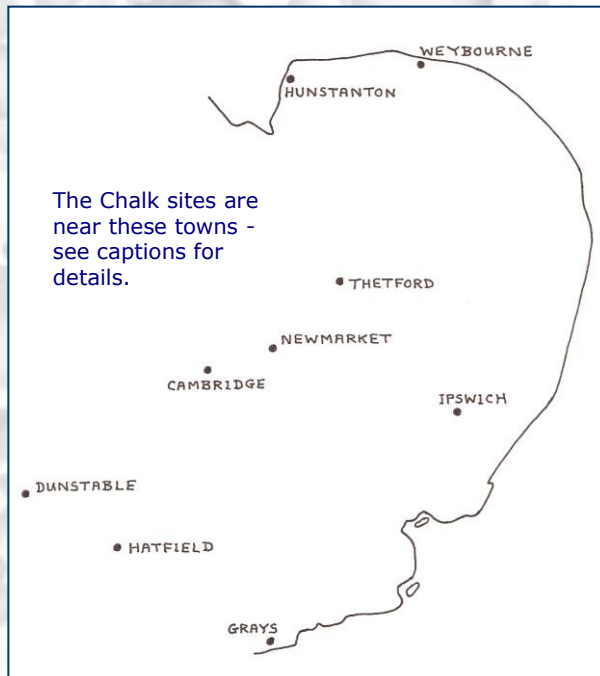


Photo © Peter Friend

DEVIL'S DYKE

CAMBRIDGESHIRE

This remarkable Anglo-Saxon earthwork has open walking access along its 12km preserved length with a ditch to dyke relief of up to 10m. It provides habitat for Chalk flora including pasque flowers and harebells. From the Devil's Dyke you can look eastwards into Suffolk to the relatively flat Newmarket Heath and the Rowley Mile Racecourse. The Jockey Club allows public access to walkers on the Heath with few restrictions. Looking westwards from the Devil's Dyke into Cambridgeshire provides views of the July Racecourse. The short turf of the Chalk is ideal for horse racing and the Chalk is only 15-20 cm below the surface in places. Car parking at Reach TL 567662 and Newmarket July Racecourse TL 619615



The Chalk sites are near these towns - see captions for details.

DID YOU KNOW- Chalk is mostly formed from fossils of calcareous planktonic algae? The microscopic fragments – rings or rosettes – known as coccoliths are shown (much enlarged) as the background of this leaflet.

© Elizabeth Harper

HARLTON WOOD, CAMBRIDGESHIRE

The wooded crest (TL 393517) of Barrington Ridge may be approached via the path from Harlton village leading up through the wooded Harlton Clunch (hard Chalk) Pit. From here there is a good view south into the Barrington Chalk Pit (no access) which shows Ice Age boulder clay on Chalk which overlies Gault mudstones at the base of the pit. Phosphate nodules occur at the junction of the Chalk and Gault and were once dug as 'coprolites' to make superphosphate fertiliser from the area to the north of the footpath. Barrington is 1km SW of Cambridge. The path (Rod's lane) starts 40m SE of the Hare and Hounds pub, TL 388524.



Photo © Peter Friend



Photo © Tim Holt-Wilson

DUNSTABLE AND WHIPSNADE DOWNS BEDFORDSHIRE

The Chilterns Gateway Centre provides walking access to the Chalk escarpment with characteristic Chalk grassland habitat. There are footpaths around the working Chalk quarry (no access) at Kensworth and to the Totternhoe Knolls, with nearby important Iron Age and Saxon sites. Totternhoe Stone is a hard stratum of Chalk used as 'clunch' (building stone) in historic times. There is a pure water spring at Totternhoe. The Downs lie beside the B4541, south of Dunstable. Park at the National Trust Chilterns Gateway Centre. www.nationaltrust.org.uk/ Look out for the Whipsnade white (Chalk) lion!

HUNSTANTON CLIFF, NORFOLK

The upper part of the cliff shows the base of the Chalk resting on older 'Hunstanton Red Chalk' and brown sandy Carstone. The strata may be seen dipping gently northwards in the cliff. Fossils of shells and other animals occur in many of the fallen blocks of Chalk. Car parks and access to the beach at TF 672412 (south end of cliff) and TF 678424 (north end).

The Chalk at Hunstanton is about 98 million years old and dips down until it is some 300 metres beneath the younger Chalk (about 75 million years old) at Weybourne, 45 km to the east. These two sites enable you to see some of the oldest and youngest Chalk in England.



Photo © Jenny Gladstone



Photo © Jenny Gladstone

There is open access to these beaches, but be aware of tides and cliff falls. Low tide is recommended for visits.

WEYBOURNE CLIFF, NORFOLK

Chalk is visible at the base of this coastal cliff, beneath younger gravels, sands and clays. Bands of black flint run through the Chalk of the North Norfolk coast. Look carefully at the Chalk to see fossil shells and sea urchins that lived in the Chalk seas.

Further to the east, at West Runton, the top of the Chalk is at sea level and at low tide it is possible to walk over the slippery Chalk platform. Embedded in the Chalk are flints and fossils. Between West and East Runton, large glacially derived Chalk chunks or rafts may be seen in the Ice Age clays in the cliff.

Car park at Weybourne Hope TG 110437.

Car park and café at West Runton TG 185432

SUNDON HILLS COUNTRY PARK BEDFORDSHIRE

At Sundon Hills the Chalk escarpment is dissected by dry valleys and shows Chalk grassland habitat created by centuries of grazing. Look across to the Sharpenhoe Clappers part of the escarpment with its beech and ash woodland planted in the 18th century for the furniture industry. Totternhoe Stone used to be excavated in the Sundon Chalk quarry.

Sundon Hills Country Park TL 048287 is north of Dunstable and Luton in the Chilterns Area of Outstanding Natural Beauty (AONB) – see www.chilternsaonb.org/



Photo © Bev Fowlston



Photo © Herts Geol Soc

WATER END, HERTFORDSHIRE

Swallow holes at Water End show where the Mimmshall Brook has eroded through impermeable clays to disappear underground into the permeable Chalk. When discharge is low they often become choked with mud and other debris, so a little search may be needed to find one. When discharge is high the stream flows on the surface. Water End, TL 230042, is south of Hatfield.

DID YOU KNOW - the Houghton Regis pits were used in an episode of Dr Who?



Photo © Janet Munro



Photo © English Heritage

DID YOU KNOW- much of the water supply of the East of England comes from underground - the Chalk aquifer?

HOUGHTON REGIS MARL LAKES, BEDFORDSHIRE

These lakes, TL008235, have developed in a large disused Chalk quarry, with exposures of Totternhoe Stone and other Chalk bands in the quarry face. The lakes are a habitat type rare in southern England and support a flourishing charophyte algal flora covering the lake bed. Public footpaths to this site are accessible from Houghton Road/High Street and from the A5 near Dunstable.

GRIMES GRAVES, NORFOLK

This is a prehistoric flint mine open to visitors. The landscape of pits and hollows was created some 5000 years ago by Neolithic/Bronze Age flint miners, excavating shafts to reach top quality black 'floorstone' flint. Visitors may climb down a shaft into Chalk galleries and peer into side tunnels dug for flint. Entrance off A134 NW of Thetford at grid ref TL 816908. Grimes Graves is an English Heritage site, see www.english-heritage.org.uk for times and prices.

BLAKENHAM WOODLAND GARDEN SUFFOLK

This garden is mainly on sand with a surprise in the woodland, where a turf art feature spirals down to a 'plughole' in the Chalk beneath the sand. The car park gives a good view of adjacent Chalk quarries (no access) which have yielded 80 million year old fossil belemnites, now preserved in Ipswich Museum. There are nearby public footpath walks across attractive Chalk downland. The garden (TM 111492) is 7km NW of Ipswich. See web site for times and prices – www.blakenhamwoodlandgarden.org.uk



Photo © Caroline Markham