

## Boulder Clay

Chalky Boulder Clay is a till (a glacial deposit) forming the gently rolling landscape across Suffolk, ending roughly along the line of the A12 road.



Claydon

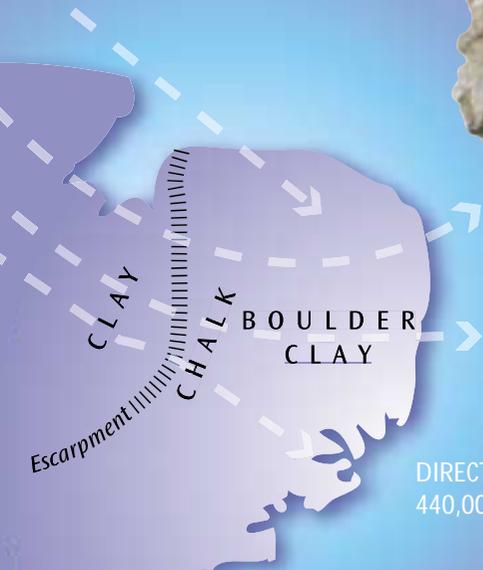
It forms the high quality farmland of Suffolk, and there is a fine section, up to 9 metres thick, in the sea-cliff at Kessingland and Pakefield.

Numerous chalk pebbles, and much-scratched rocks containing Jurassic fossils may be found in gardens and ploughed fields on the boulder clay. These are glacial erratics ('wandering stones').

The ice-sheet eroded Jurassic clay from the area of Fenland and then the Chalk escarpment between Newmarket and Swaffham before fanning out towards the east and south-east to deposit its load of boulder clay on Suffolk.

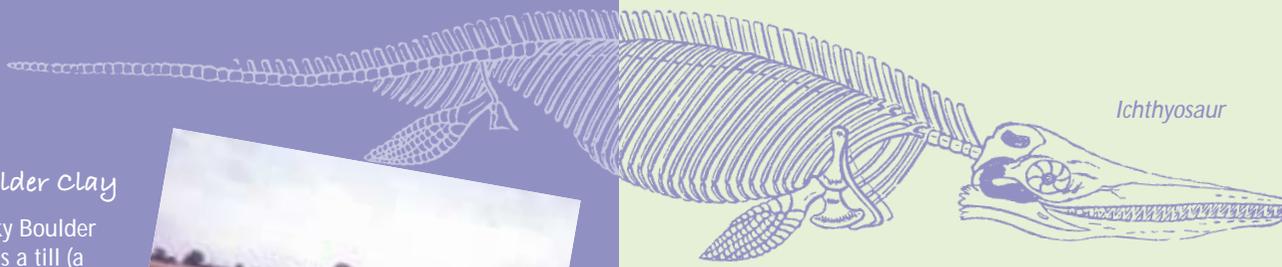


Boulder Clay



DIRECTION OF ICE-SHEET  
440,000 YEARS AGO

Ichthyosaur



## Fossil vertebrae of Ichthyosaur (left) and Plesiosaur (right)

These are the central parts of the vertebrae (back bones) of formidable reptilian predators of Jurassic seas. Ichthyosaurs were superficially fish or dolphin like, had very large eyes, with their limbs being short steering paddles; this fossil was found in the boulder clay at Debenham. Plesiosaurs were often of considerable size, to a length of more than 12 metres, and had well developed paddles for swimming. This vertebra is from Creting St Mary. Their skeletons were broken up by the ice-sheet.



## Geological Maps

The British Geological Survey, Keyworth, Nottingham, publishes 1:50,000 geological maps of Suffolk, 176 Lowestoft, 189 Bury St Edmunds, 190 Eye, 191 Saxmundham, 206 Sudbury, 207 Ipswich and 208,225 Woodbridge and Felixstowe, also 1:250,000, 52N00 East Anglia (Quaternary). They are also available from UKGE Limited, 10 Elliot Avenue, Reydon, Southwold, Suffolk, IP18 6QX; telephone 0870 922 0091, [www.ukge.co.uk](http://www.ukge.co.uk)

This leaflet is published by the Suffolk RIGS Group (GeoSuffolk), 2005, who wish to acknowledge the financial support of English Nature and UKGE Ltd. RIGS are Regionally Important Geological and Geomorphological Sites. We aim to promote understanding and appreciation of the geo-resources of Suffolk. (RM 2005)

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Ipswich Museum  
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# GEO Suffolk

## Suffolk's Time Travellers

# The Erratics

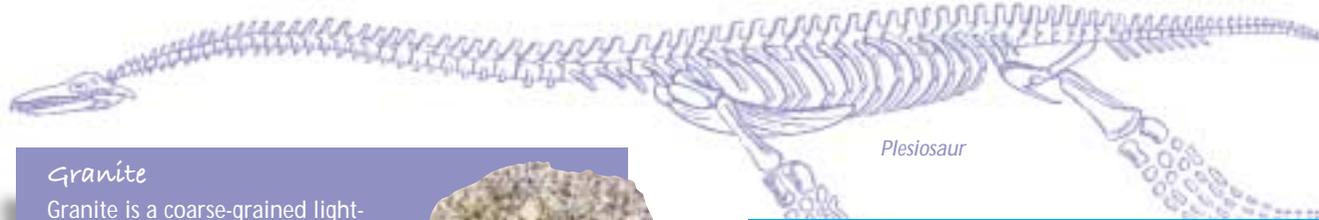
155 million years



440,000 years

# Ice Age erratics in Suffolk

Discover rocks and fossils many millions of years old brought to Suffolk by an ice-sheet about 440,000 years ago during the Ice Age. Here are some erratics you may find in boulder clay country



*Plesiosaur*

## Granite

Granite is a coarse-grained light-coloured igneous (once-molten) rock. It occurs in northern England, Scotland and Scandinavia, exposed at the surface after millions of years of erosion. This specimen was found in the boulder clay of Great Blakenham.



## Dolerite

Dolerite is a medium-grained dark-coloured igneous rock, occurring in geological features such as the Great Whin Sill of northern England. This specimen was found in the boulder clay of Creting St Mary, and shows characteristic sphaeroidal weathering (spalling off of concentric shells from the rock). In such rocks a hand lens and often a microscope are necessary to see the crystals.



## Fossil Sea-urchin (Echinoid)

This high-domed roughly oval sea-urchin is *Echinocorys*. It is preserved in flint. The original shell of this sea-urchin has been dissolved by acidic groundwater, leaving a cavity and preserving external and internal features. This specimen originated in Chalk of Late Cretaceous age, is about 80 million years old, and was found at Hintlesham.



## Fossil Oyster, *Gryphaea arcuata*

A bivalve shell of Early Jurassic age (about 190 million years old). It has a very thick, convex under valve and a lid-like small valve, and is popularly known as the Devil's Toe-nail Oyster. They originate in Jurassic clays in the Midlands and Yorkshire. This specimen was found in the boulder clay at Stowupland.



## Belemnite

This is the internal shell from an extinct mollusc which flourished in Jurassic and Cretaceous seas. It is related to the cuttlefish and squid which swim in modern seas. This Jurassic specimen is from the boulder clay of Great Blakenham.



## Ammonite

Some fossil ammonites still show the pearly lustre of their original outer shell. Worn specimens infilled with rock often show zig-zag lines on the surface, which mark the complex folds of partitions between internal chambers. Ammonites are extinct but have a living relative, the Pearly Nautilus of the Indian Ocean and western Pacific. This Jurassic specimen (about 155 million years old) is from the boulder clay of Corton.



## Striated boulder

From Hadleigh Road, Ipswich

The scratches were produced when the rock was trapped in the moving ice sheet and ground against bedrock at the base of the ice or against other rocks within the ice.



## Septarian Nodule

From Whitton, Ipswich

A Jurassic mudstone nodule with internal cracks filled with calcite crystals forming veins which weather out.



## Kimmeridge Shale

A thinly-layered rock made of silt and clay-size particles, often containing fossil shells. This specimen was found at Great Blakenham, over forty miles from the parent rock in the Fenland.



## Limestone

Limestones are soft carbonate rocks which can travel for great distances in an icesheet without undergoing chemical decomposition. This specimen is Jurassic Oolitic limestone, composed of small spherical carbonate particles, and was found at Claydon.



## Spilsby sandstone

Black phosphate nodules, fossil shells and small rounded grains of quartz sand are cemented by shiny crystalline calcite. This specimen was found at Great Blakenham, having been brought from Lincolnshire or The Wash area by the icesheet.

