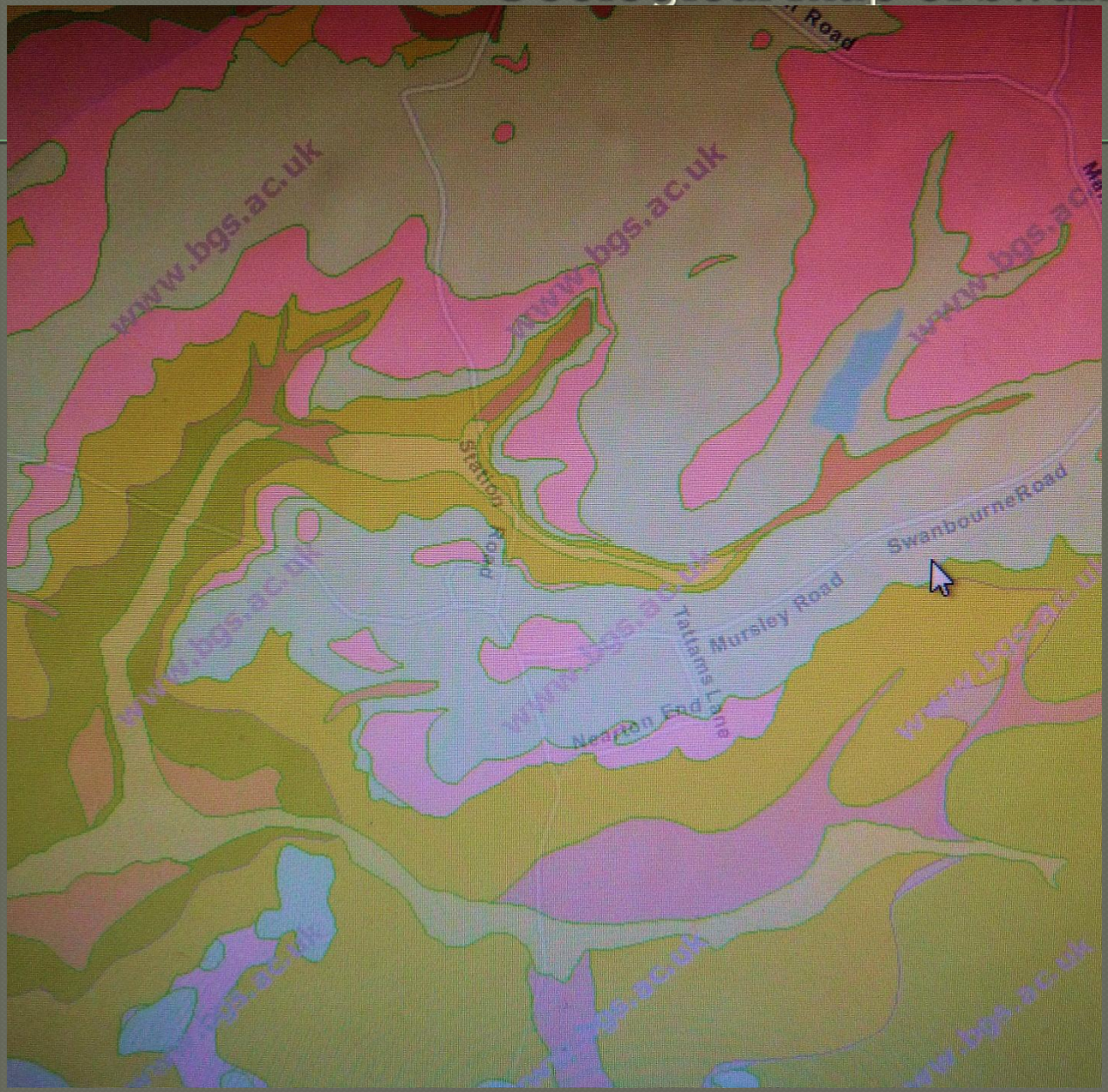
The Earth History of Swanbourne & Aylesbury Vale

Part 1

Superposition – shown in a soil section in Swanbourne

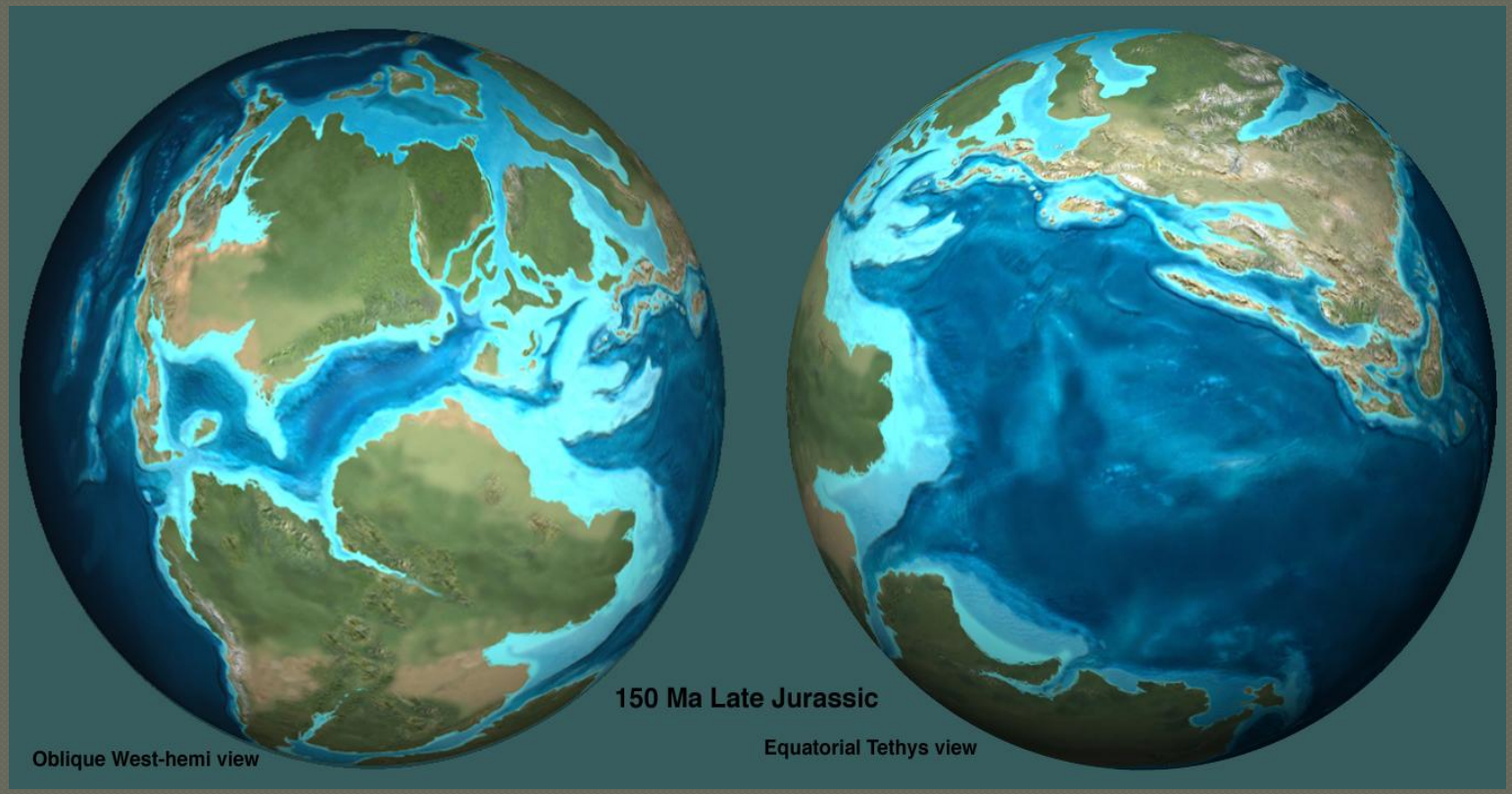
Geological map of Swanbourne



JURASSIC AND CRETACEOUS PERIODS

Sedimentation in sub-tropical latitudes

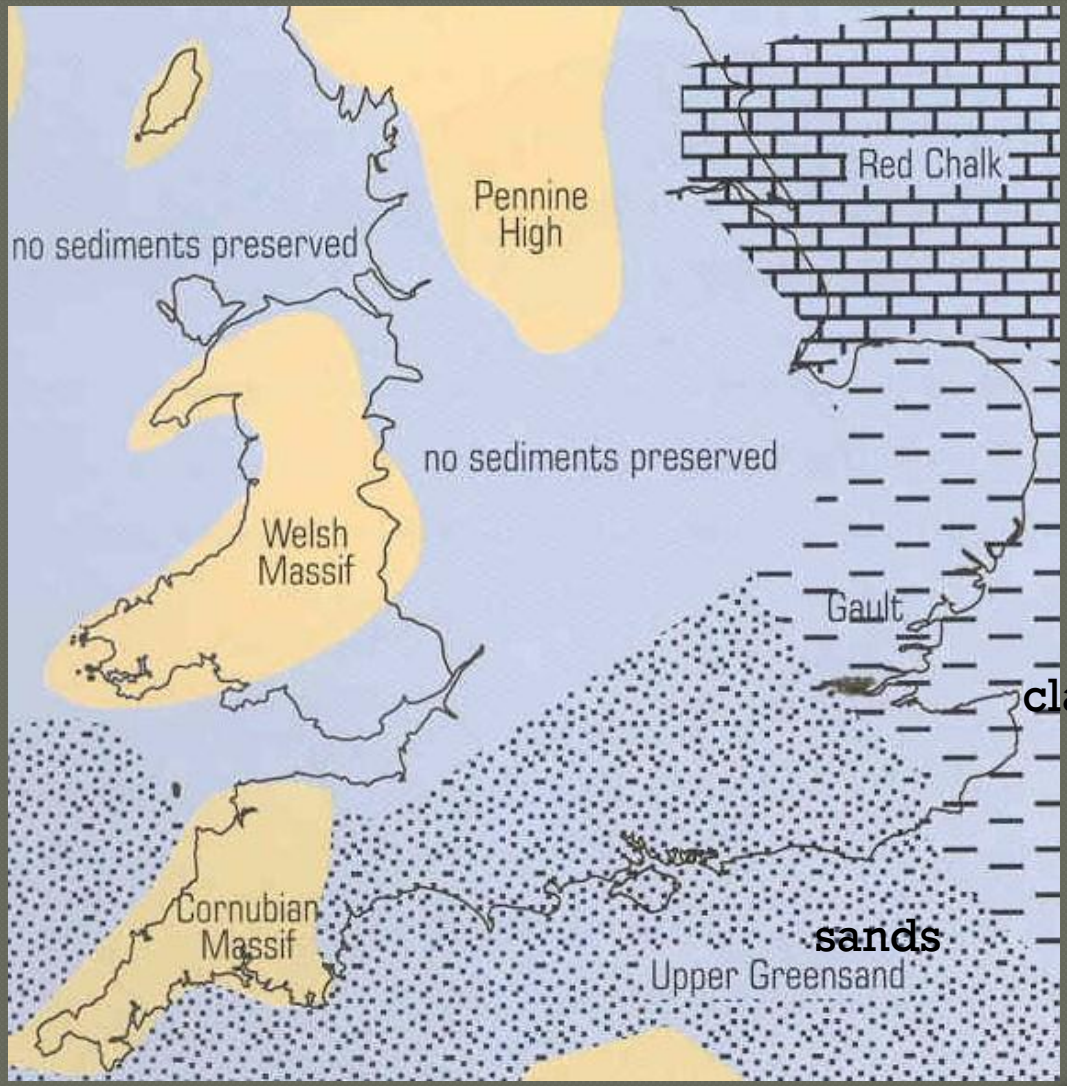
The world 150 million years ago in late Jurassic times showing the break up of Pangea, the ancient supercontinent



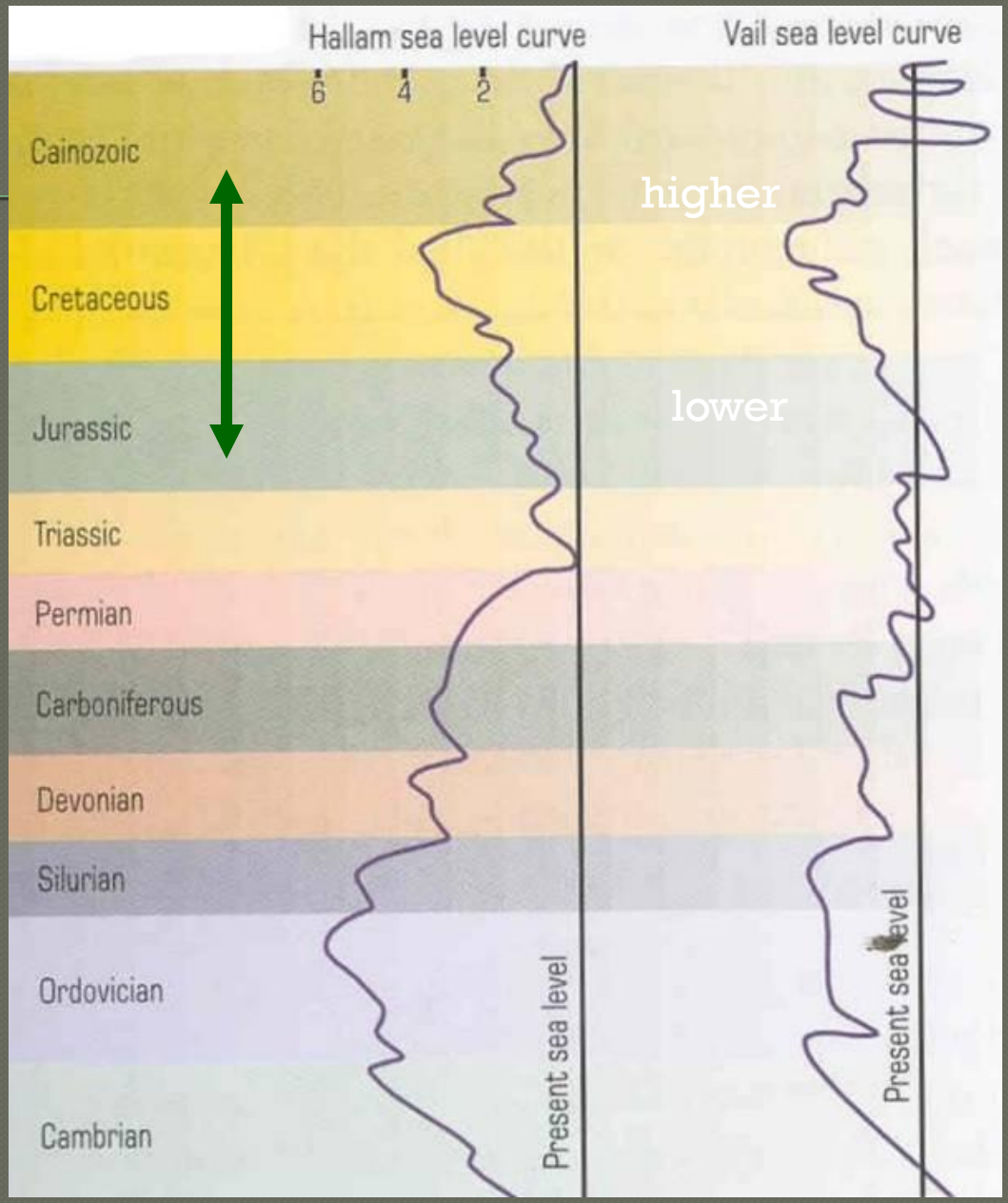
The North Atlantic is beginning to open along constructive plate margins to the E and W of Greenland. North America and Eurasia are separating. Shallow seas, shown in pale blue, are found above many areas of continental crust, giving widespread shallow water deposition on continental shelves.

Lower Cretaceous palaeogeographic map

This map shows that most of the area that is now the UK was covered by water in the Lower Cretaceous, although different sediments were deposited in different places. In the Upper Cretaceous sea-level rose again so that Chalk was deposited everywhere.



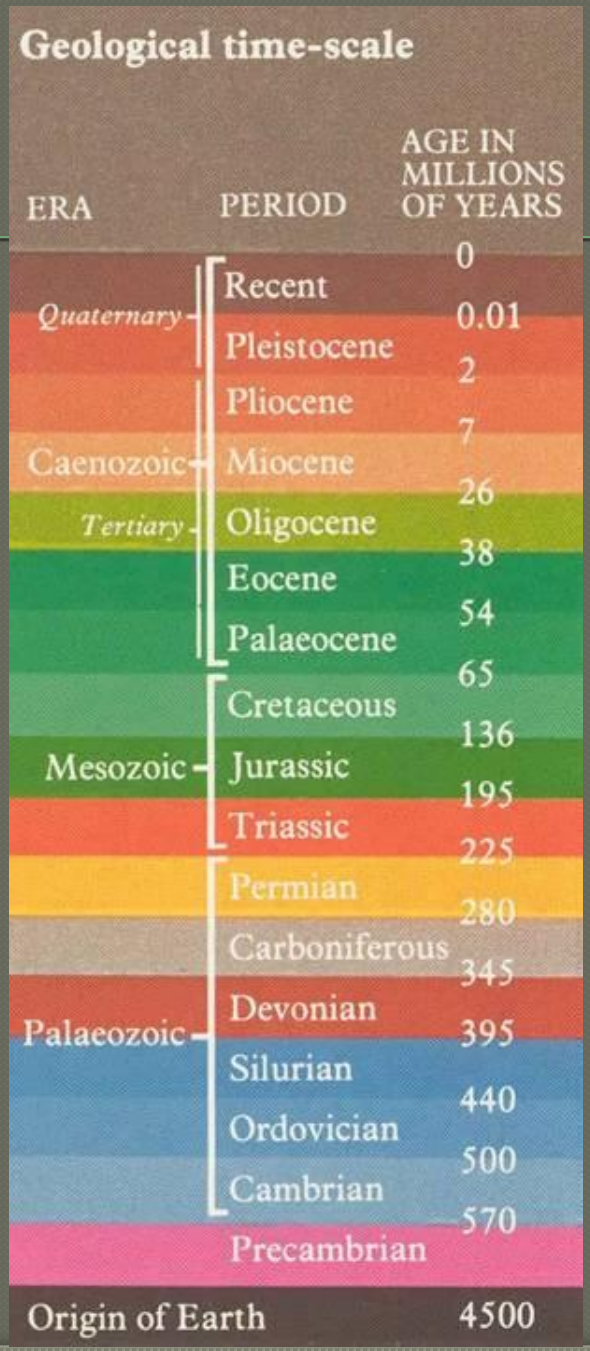
Sea-levels rose during the Jurassic and Cretaceous periods. As Pangaea broke apart, constructive plate margins displaced ocean water onto continental shelves. Fluctuating sea-levels in the Jurassic and Cretaceous periods led to a great variety of deep and shallow water continental shelf sediments.



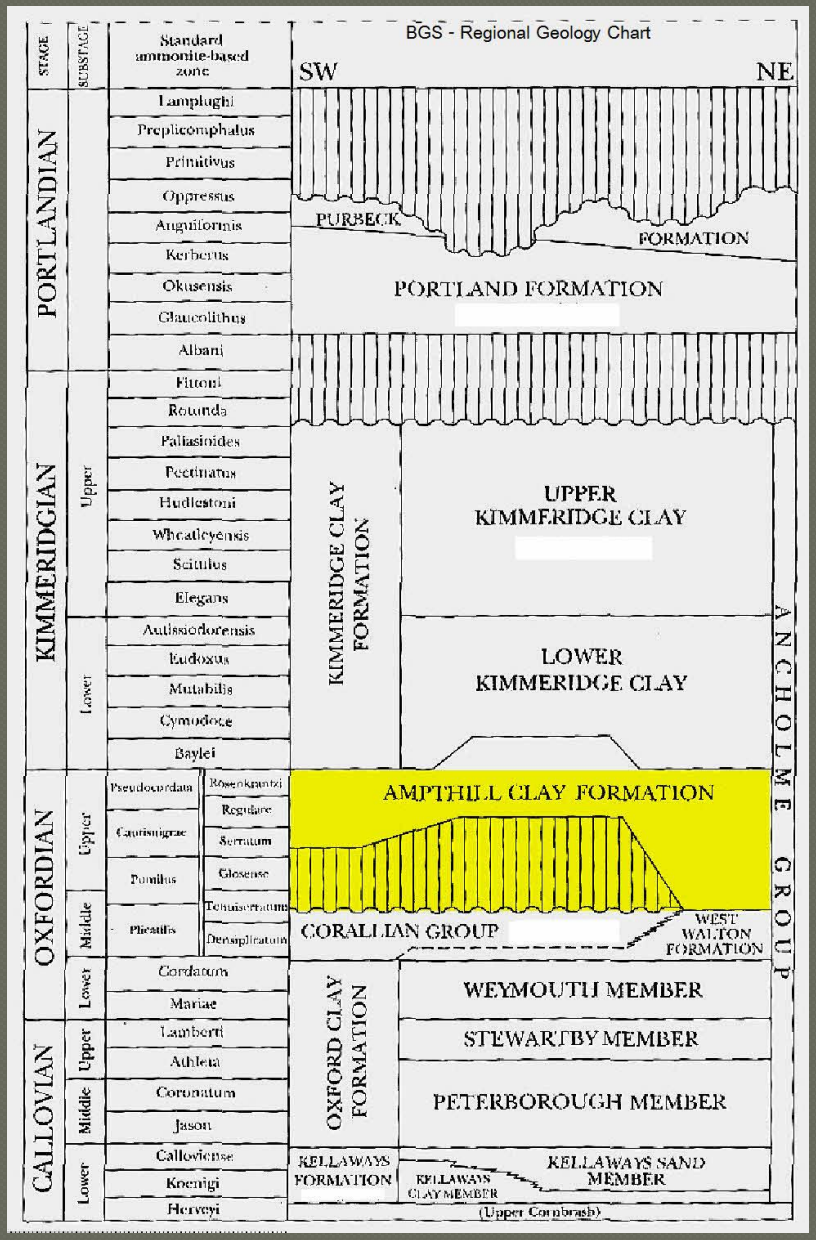
Stratigraphic table

PHANEROZOIC EON

MESOZOIC ERA

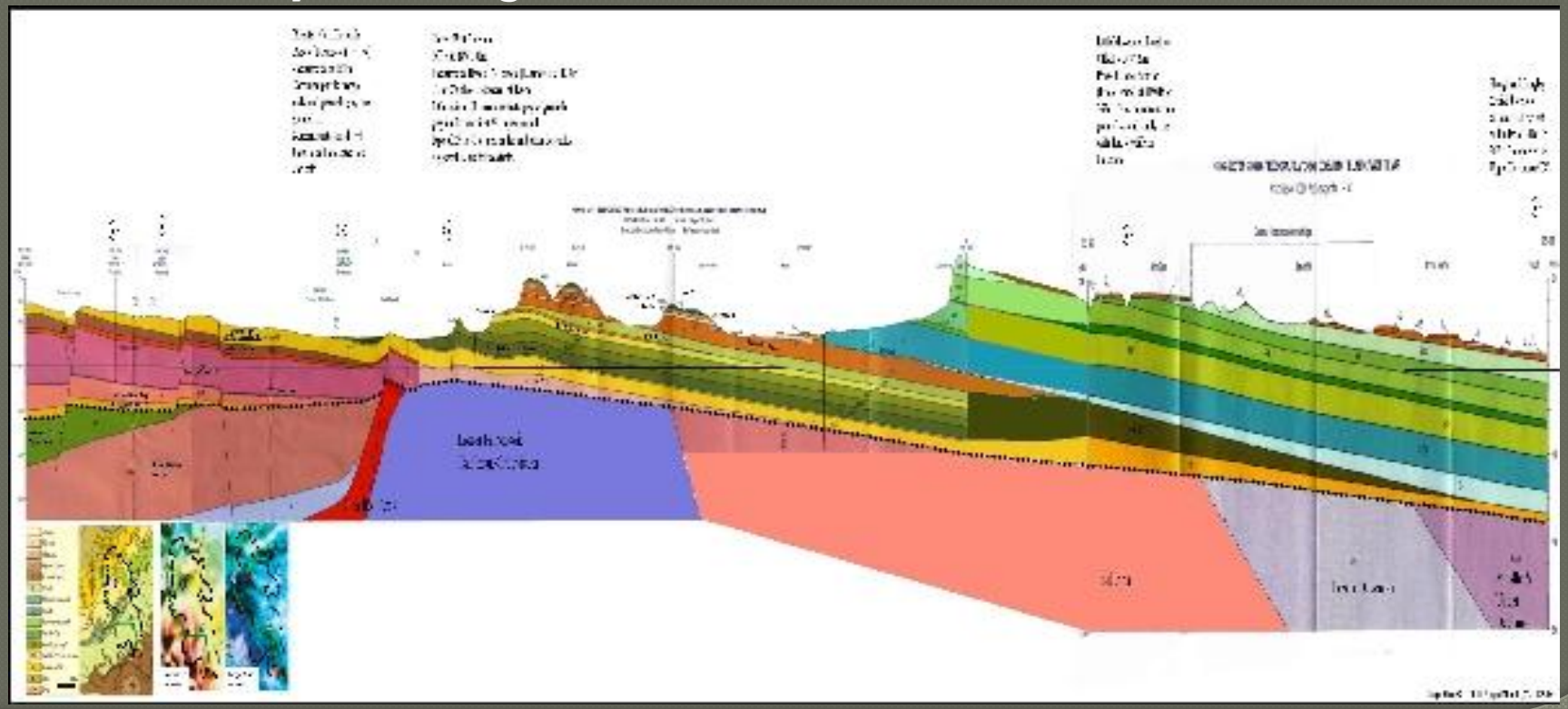


Jurassic and Cretaceous periods


BGS - Regional Geology Chart
SW
NE
STAGE
SUBSTAGE
Standard ammonite-based zone
PORTLANDIAN
KIMMERIDGIAN
OXFORDIAN
CALLOVIAN
Upper
Lower
Middle
Lamplughi
Preplicomphalus
Primitivus
Oppressus
Anguiformis
Kerberus
Okusensis
Glaucolithus
Albani
Fittoni
Rotunda
Pallasioides
Pectinatus
Hudlestoni
Wheatleyensis
Scitulus
Elegans
Autissiodorensis
Eudoxus
Mutabilis
Cymodoce
Baylei
Pseudocordata
Cautisnigrae
Plicatilis
Rosenkrantzi
Regulare
Serratum
Glosense
Tenuiserratum
Densiplicatum
Cordatum
Mariae
Lamberti
Athleta
Coronatum
Jason
Calloviense
Koenigi
Herveyi
PURBECK
FORMATION
PORTLAND FORMATION
KIMMERIDGE CLAY FORMATION
UPPER KIMMERIDGE CLAY
LOWER KIMMERIDGE CLAY
AMPTHILL CLAY FORMATION
CORALLIAN GROUP
WEST WALTON FORMATION
OXFORD CLAY FORMATION
WEYMOUTH MEMBER
STEWARTBY MEMBER
PETERBOROUGH MEMBER
KELLAWAYS FORMATION
KELLAWAYS CLAY MEMBER
KELLAWAYS SAND MEMBER
(Upper Combrash)
ANCHOLME GROUP

The rocks exposed at the surface in Buckinghamshire range from the Quaternary glacial deposits (less than 2.6 million years old) to the Upper Lias (Jurassic 190 million years old) in the north of the county. However, this is only part of the story, below the surface much older rocks are present.

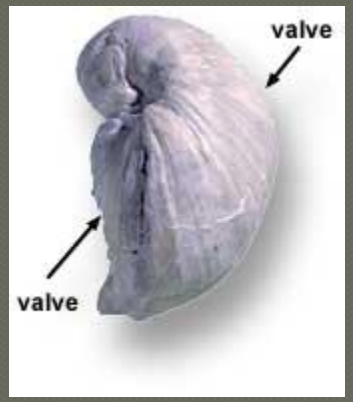
The figure below shows a cross section through Buckinghamshire from north to south. The different rock layers are shaded by different colours. In order to display such a long distance, the section has been squeezed and the vertical scale exaggerated. The rocks dip to the South-East by 1 to 2 degrees.



Local ammonites, gastropods and bivalves

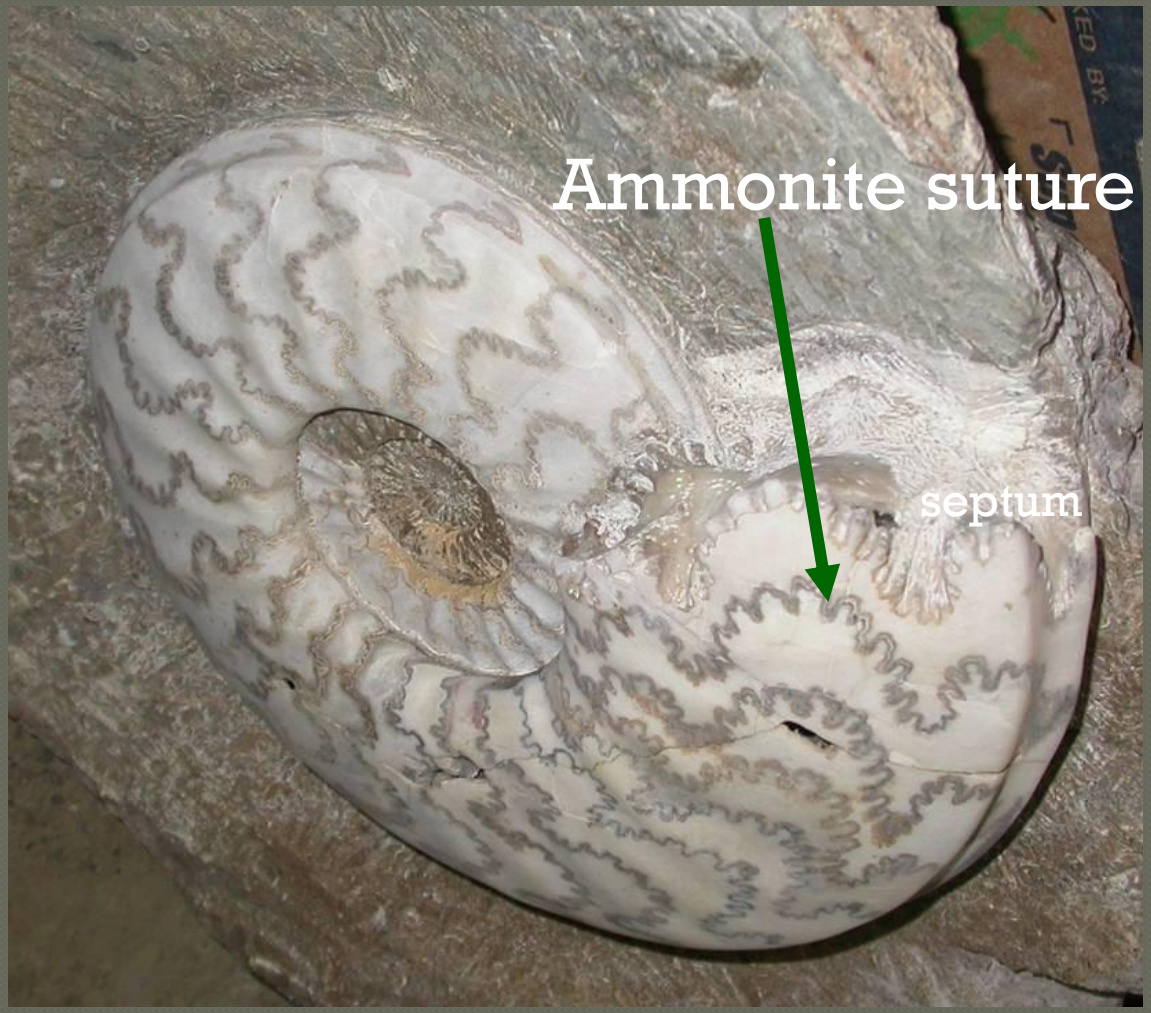
Bivalve fossils normally have two valves that are mirror images of each other.

- There are exceptions to this in both modern and fossil species, where the valves are asymmetrical.
- E.g. Gryphea from the Jurassic, an ancient oyster. This is the fossil you are most likely to dig up in the garden, as they are common in the Oxford Clay.



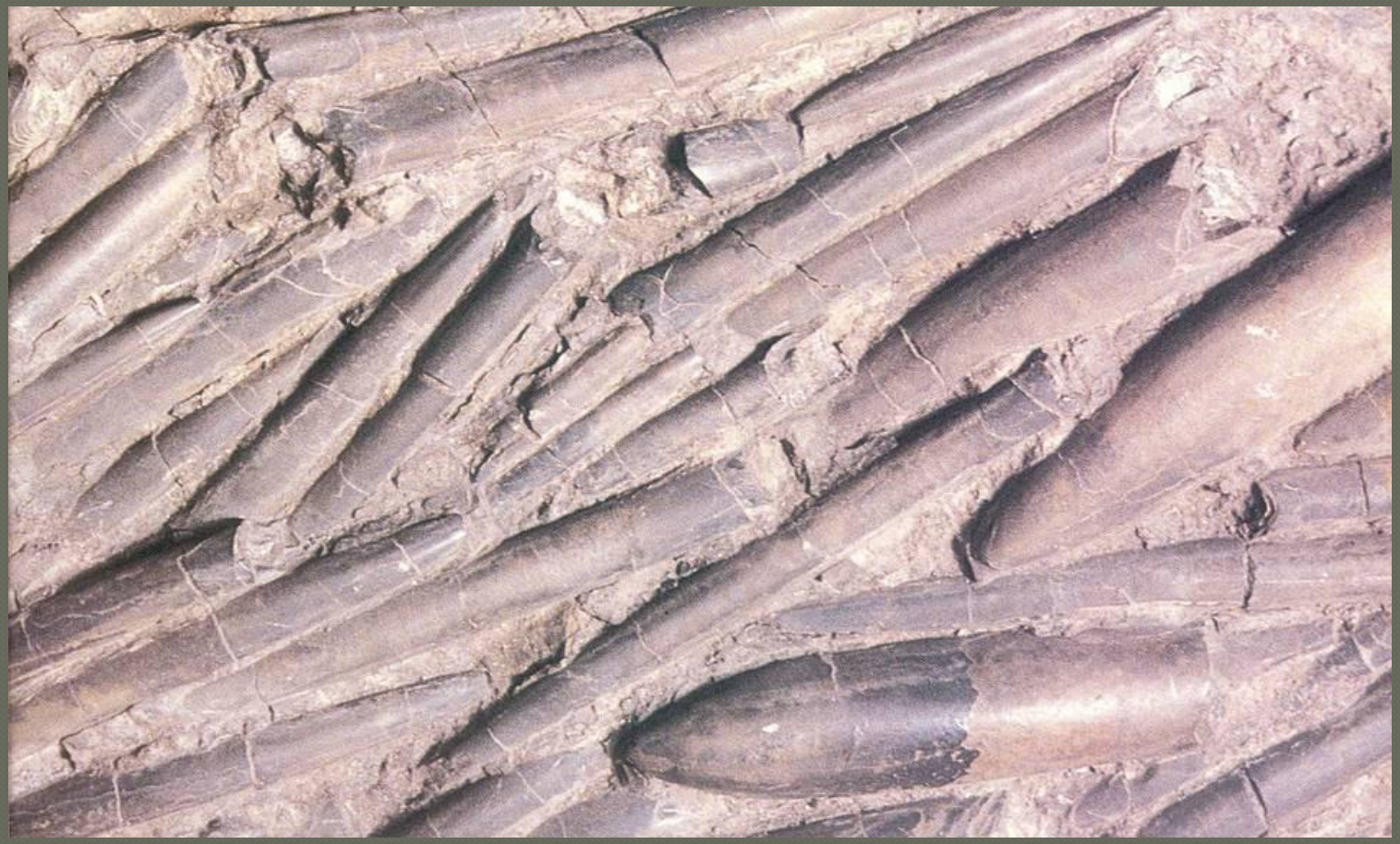
Gryphea – the "devil's toe nail"

Ammonite suture shapes help to identify them



Nautilus from the Pacific Ocean is the nearest living relative of ammonites today

Belmnites are are ancestors of the cuttlefish. They are the internal bones of these ancient squid. They look like bullets and may be found in gardens in this area. They are made of calcite.



The Portland Limestone as seen in buildings around Swanbourne

Most pieces of Portland Limestone show shell sections

Clams & oysters today and a Jurassic fossil oyster (Gryphaea) from the clay of Charlton Close (bottom right)

Twenty million years ago, the Alpine earthy movements uplifted South East England. Within the last two million years, the climate has been cool enough to result in four major glacial advances. Only the penultimate one reached us with glaciers melting here. The result is a thin superficial deposit in many places above the bedrock of either boulder clay or outwash sands and gravels.

The Archaeology of Swanbourne

Part 2

Stone age flints show percussion marks around the edge. A single flint tool has been found from Swanbourne. Iron age coins have been found in Hoggeston

- Hand axe

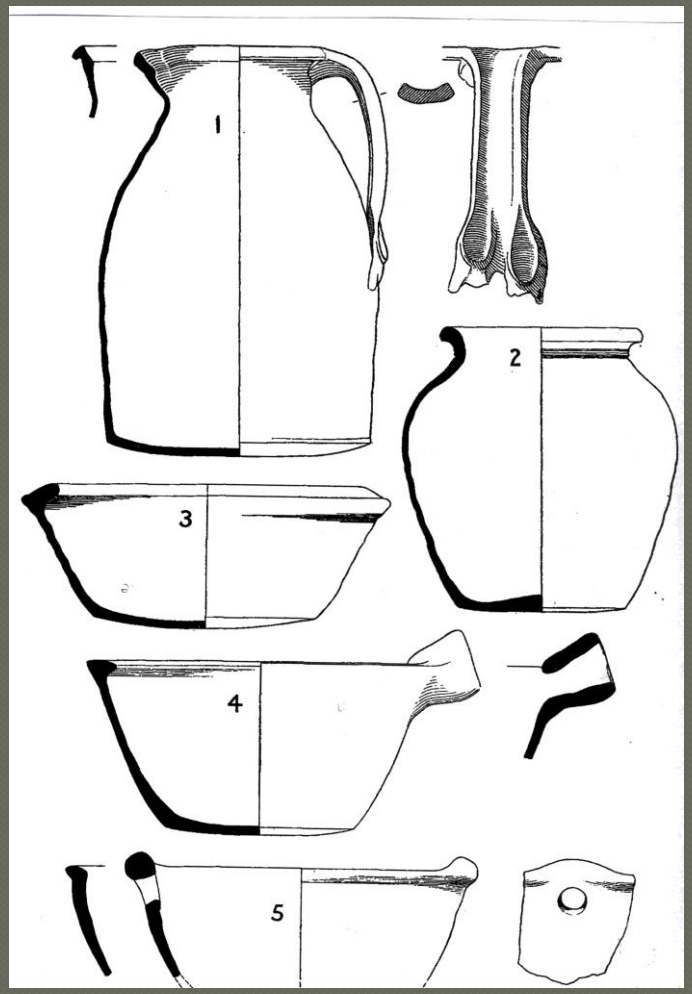
Roman pottery fragments found by Ken Reading between Swanbourne and Hoggeston

Roman pottery fragment - tableware with dot decoration.

Ridge and furrow fields between Swanbourne and Hoggeston

Saxo-Norman to Medieval pottery fragments from Swanbourne

Late Saxon pottery



Medieval pottery

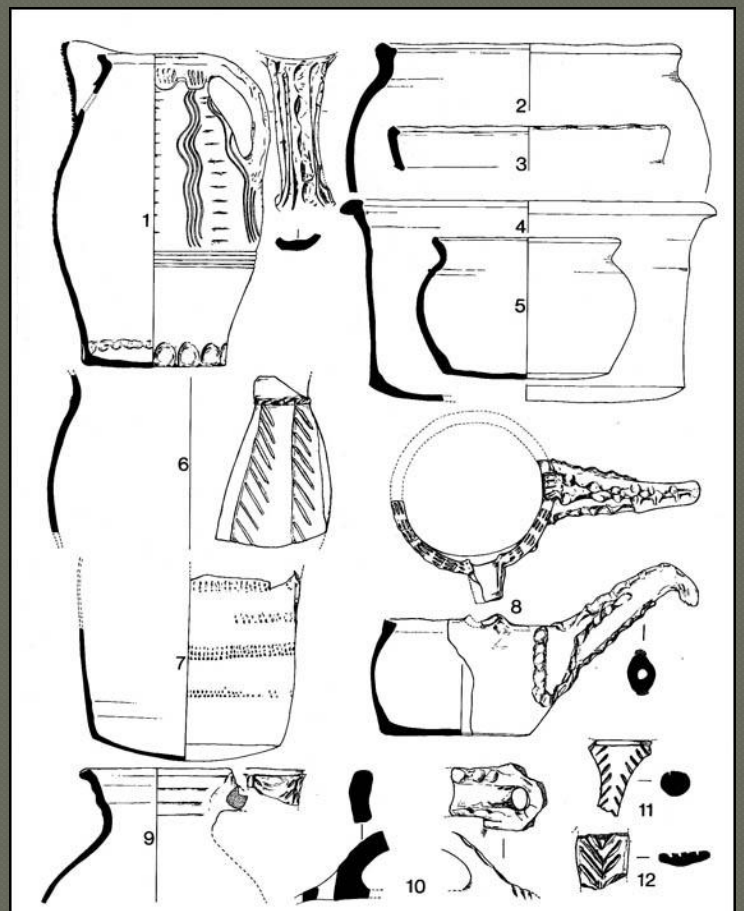


Fig. 13. Medieval pottery: all pit 628. (Scale 1:4.)

Blue Willow Pottery

Blue Willow pottery was in common useage in the 1700s. It was first manufactured at Caughley Pottery Works by Thomas Turner. Blue Willow pieces quickly grew to become popular dishes for use in the home. Fragments are common in gardens around Swanbourne.

Comparision of early willow leaf with brush strokes (left) with later willow leaf with transfer background dots (right).

What you might expect to dig up – examples from Station Road

Clay pipe fragments date from the 17th to the 19th century (from Charlton Close)

Metal objects – Station Road

Great Western Railway employee's brass button

A GUIDE TO IDENTIFYING SWANBOURNE ARTEFACTS

Does it look like rock? --→ YES → BROWN COLOUR, sand grains seen = SANDSTONE; most likely Cretaceous Greensand from Leighton Buzzard (105 million years old).

Does it look like rock? → YES→ BEIGE COLOUR, often containing shell impressions (fossils) = LIMESTONE; most likely Jurassic Portland Limestone from Whitchurch/Oving hill (140 million years old).

Does it look like brick? → YES → Reddish colour = old HOUSE BRICK fragment. Could go as far back as the 17th Century in Swanbourne, and derived from fired Oxford Clay.

Does it look like clay? → YES → Reddish colour with a mix of pebbles which are subangular and made of non local rocks? → YES = GLACIAL BOULDER CLAY. Derived from the ice sheet that covered this area in the Ice Age, approx 300,000 years ago The pebbles are erratic, transported a great distance from their point of origin.

Looks like clay but blue/grey colour → YES = Jurassic OXFORD CLAY, West Walton Series, the bedrock of Swanbourne, is 150 million years old. May contain large curled shells called Gryphaea, sometimes nicknamed the "Devil's toe nails" which are ancestral oysters, or bullet shaped objects called belemnites which are ancestral cuttlefish remains. Farm labourers used to think these were thunderbolts.

Does it look like pot? → YES → Is it curved, more than 1cm thick and brassy colour? → YES = DRAINAGE PIPE FRAGMENT; 20th Century in age.

Does it look like pot? → YES → Is it dark coloured, quite thick (up to 1cm thick) with ground shell fragments contained within the pot fragment?→ YES = MIDDLE AGES TO ANGLO-SAXON POTTERY FRAGMENT most likely; may date between 700AD to 1400AD.

Does it look like pot? → YES → Is it of terra cotta, orange to white in colour, unglazed with a good shape? → YES = ROMAN POTTERY most likely; likely to date between 100AD to 400AD.

Does it look like white pot (china), is thin, of good quality and blue or green with intricate tree, leaf or flower patterns? → YES = WILLOW LEAF POTTERY

- **Brush strokes clearly seen =** 16th-17th Century in age**.**
- **Fine dots in background suggest a transfer =** 18th-19th Century.

White china with multi-coloured patterns? = MODERN (20th Century) POTTERY.

Is the object brown with sharp edges and percussion rings? → YES = FLINT

Is the flint shaped like an axe or arrow head? → YES = PRE=HISTORIC TOOL; could be half a million years old.

Is the object white, tubular and with a hole down the middle? YES = FRAGMENT OF CLAY PIPE; may date from the 17th to the 19th Century in age.

SPHERICAL OBJECT → Heavy, metallic, lead grey colour = LEAD PISTOL SHOT (18th/19th Century).

The End