Glossary

Anglian

A major glacial period during the middle Pleistocene Epoch, about 450,000 years ago. Suffolk was covered by an ice sheet from the north-west which extended as far south as Hornchurch in Essex. When it retreated it left behind thick deposits of till or ‘boulder clay’, and also beds of outwash sands and gravels deposited by meltwater.

Antian-Bramertonian

A stage (time period) during the early Pleistocene Epoch, about 2 million years ago. Originally identified as two separate temperate climatic stages (Antian and Bramertonian) on the basis of their fossil pollen record, the two are now considered to represent one single period. Sediments of the Norwich Crag Formation were being deposited at this time.

Baventian

A stage (time period) during the early Pleistocene Epoch, about 1.85 million years ago. Conditions in Suffolk were probably similar to parts of the Arctic today, with an environment of pine and birch forest, heathland and peat bog. It is named after the deposits in the cliff at Easton Bavents.

Bytham River

A major river which is thought to have flowed north-eastwards across Suffolk in early Pleistocene times, between about 0.85 and 0.5 million years ago. Its sediments are characterised by a distinctive suite of quartz-rich pebbles derived from the Midlands.

Bryozoan

Bryozoa (literally ‘moss animals’) or polyzoa are colonial filter-feeding invertebrates. They have an encrusting or a branching mode of life. They are a notable component of the Coralline Crag beds of Suffolk, where they represent the vestiges of a bryozoan fauna which was formerly more widespread before the onset of cooler climatic conditions in late Pliocene times.

Caenozoic

The Era which follows that of the Mesozoic, including our own Holocene Epoch. It is characterised by the dominance of grasses, birds and mammals.

Coprolites

Literally, ‘fossilised animal droppings’, this name was erroneously given in the 19th century to the brown phosphate-rich nodules found in the lowermost beds of Crag strata in Suffolk. Ground up and spread on the land, they made an effective ‘superphosphate’ in the days before artificial fertilisers. The credit for this discovery goes to Professor John Henslow, from Hitcham in Suffolk, who visited Felixstowe in the 1840s, and saw the potential of the nodules. The industry had become uneconomic by the early 20th century.

Coralline Crag

A formation of sandy, fossiliferous, marine limestones found only in south-east Suffolk. The name ‘Coralline’ is derived from their notable content of bryozoan (polyzoan) fossils, initially mistaken for corals. These beds were laid down between about 4.0 and 3.6 million years ago. It is thought that sea water temperatures then were slightly warmer than today.

Crag

A traditional name given to the fossil-rich, sandy beds which outcrop in the coastal parts of Suffolk. A high lime content made these sediments useful for marling the fields to ‘sweeten’ sandy soils, hence the many crag pits found in the Suffolk Sandlings. The name has been adopted by geologists to describe a sequence of beds of Pliocene and early Pleistocene age outcropping in East Anglia: the Coralline, Red and Norwich Crags.

Cromer Forest-bed

A formation of freshwater and marine sediments found in Suffolk and Norfolk, deposited between about 1.7 and 0.5 million years ago. The freshwater deposits have notably yielded evidence of fossil mammals such as the West Runton Elephant and the earliest human occupation of northern-Europe, as at Happisburgh and Pakefield.

Cross-bedding

A sedimentary structure characterised by inclined bedding planes within a generally horizontal rock unit, caused by the progressive deposition of sediment at the front of dune or ripple bed forms.

Devensian

A stage (time period) of the late Pleistocene Epoch, between about 115,000 and 10,000 years ago. It is a predominantly cold period culminating in a major glaciation about 20,000 years ago when ice sheets reached north Norfolk, and Suffolk was part of the tundra zone.

Eocene

An Epoch of the early Caenozoic Era between about 56 and 35 million years ago. Due to continental drift, Britain lay close to the Equator and had a tropical climate; the land area where Suffolk now is lay beneath the sea.

Geodiversity

The natural range (diversity) of geological features (rocks, minerals, fossils, structures), geomorphological features (landforms and processes) and soil and water features that make up the landscape. It forms the non-biological foundation for all life, including human.

Harwich Formation

A formation of sandy and silty clays and clay- mudstones (‘cementstones’) of early Eocene age, deposited in a tropical sea about 55 million years old. It contains layers of volcanic ash, thought to be derived from volcanoes in the region of Denmark, of which the most notable is the Harwich Stone Band; this historically provided material for building stone and cement making in Suffolk. It is difficult to distinguish this formation from the overlying London Clay Formation; both contain stone bands.

Holocene

An Epoch of the late Caenozoic Era and the Quaternary Period, between about 10,000 years ago to the present day. Its beginning corresponds with the onset of warming conditions at the end of the last glacial period (the Devensian stage). It is characterised by increasing human impacts on the Earth’s systems. There is current debate about whether we have now entered a new Epoch, the Anthropocene, characterised by visible impacts of human life in the geological record.

Jurassic

An Epoch of the Mesozoic Era between about 201 and 145 million years ago, during which dinosaurs were the dominant group of animals and the first birds evolved. The area of Suffolk was on the edge of a land area known as the London-Brabant Massif, about 30º north of the Equator (the same latitude as Cairo today).

Kesgrave Formation

A formation of sands and gravels outcropping in the south-eastern part of Suffolk, laid down by the ancestral River Thames between about 1.7 and 0.5 million years ago. Its sediments are characterised by a distinctive suite of quartz-rich pebbles derived from western Britain.

London Clay Formation

A formation of marine clays and clay- mudstones of Eocene age, deposited in tropical seas about 53 million years ago. The London Clay outcrops on the coast and along the sides of valleys in south-east Suffolk. The clays were used here for brick-making. It is difficult to distinguish this formation from the underlying Harwich Formation; both contain stone bands, though these are thinner and sparser in the London Clay.

Longshore drift

The process by which sediments are moved along a shoreline by wave action. In general terms, waves, pushed by the prevailing wind, tend to wash material up a beach at an angle to the shore, but wash it back down again perpendicularly. The net effect is that each wave moves some sediment along the beach in a zigzag fashion. Over time, or in a major storm, very large amounts of material can be moved.

Lowestoft Formation

A suite of glacial tills, silts, sands and gravels of middle Pleistocene age deposited by an ice sheet from the north-west during the Anglian glaciation, about 450,000 years ago. It underlies much of Suffolk, Norfolk and Essex, notably forming the ‘boulder clay’ plateau landscape.

Mastodon

The popular name for a group of elephant-like animals called the Gomphotheres. They had distinctive mammilated teeth, and either one or two pairs of tusks. Mastodon specimens in Suffolk have only been found in the Crags.

Mesolithic

A period in prehistory spanning the time between the Palaeolithic and the Neolithic. It was characterised by a mobile human lifestyle based on hunting and gathering, and lasted in Suffolk from about 10,000 to 6,500 years ago.

Miocene

An Epoch of the Caenozoic Era between about 23 and 5 million years ago. It is only represented in Suffolk by material reworked into later Crag deposits.

Neogene

The second Period in the Caenozoic Era, spanning from the beginning of the Miocene to the beginning of the Quaternary (23 to 2.5 million years ago).

Ness

The Saxon term for a promontory, now incorporated into modern place names.

Norwich Crag

A formation of marine sands, silts and clays of early Pleistocene age, between about 2.4 and 1.8 million years old, outcropping in eastern Suffolk and Norfolk.

Palaeocene

An Epoch of the early Caenozoic Era between about 64 and 56 million years ago. Due to continental drift, Britain lay close to the Equator and had a tropical climate; the land area where Suffolk now is lay beneath the sea. The Palaeocene began with the mass extinction event which concluded the Age of the Dinosaurs. It ended with a Thermal Maximum event, characterised by a hotter planet with unstable climate, possibly related to increased volcanic activity which released extra carbon dioxide into the atmosphere.

Pliocene

An Epoch in the late Caenozoic Era, between about 5 and 2.5 million years ago. The global average temperature in the mid- Pliocene was 2–3 °C higher than today, and average sea levels were 25 m (82 ft) higher. Later, the tectonic closure of the Isthmus of Panama led to cooler waters in the North Atlantic, while shifts in global climate led to the onset of colder conditions in the northern hemisphere.

Pleistocene

An Epoch in the Quaternary Period, between about 2.5 million and 10,000 years ago. Its ending corresponds with the end of the last glacial period (the Devensian stage). It is characterised by cyclical shifts in the Earth's climate between cold (glacial) and warm (interglacial) periods, driven by variations in planetary orbit round the sun.

Pyritisation

A mineralisation process whereby organic materials in wet sediment become replaced by iron pyrites (iron sulphide) through bacterial action.

Quaternary

The third Period in the Caenozoic Era, spanning from the beginning of Pleistocene to the present day (2.5 million years ago onwards), including the Holocene.

Red Crag

A formation of fossil-rich, marine sands and silts of late Pliocene and early Pleistocene age, between about 2.9 and 2.5 million years old, outcropping in eastern Suffolk and parts of Essex and Hertfordshire. It is called 'red' after the high content of iron oxide in the sediment, and it contains some ironstone layers. It was laid down as sand banks and intertidal sand flats on the western edge of the shallowing North Sea basin.

Roman cement

A natural cement made by calcining and grinding a lime-rich clay or mudstone in a process patented in 1796. It gave rise to an important industry in south-east Suffolk until it was superseded by the Portland cement making process in the early 19th century.

Spit

A naturally mobile promontory of material, normally sand and/ or shingle, deposited by longshore drift, which projects out from a headland. Orford Ness is a classic example.

Terebratulids

A Class of marine animals with shells belonging to the Phylum Brachiopoda (Lamp Shells).

Till

Unsorted, crudely stratified material deposited directly by glacial ice; otherwise known as 'boulder clay'.

Unconformity

A term used to describe a break in the orderly sequence of strata in the geological record, caused by erosion or non-deposition of sediment at one time horizon.

Westleton Beds

A distinctive suite of coarse, water-rounded, flint- rich gravels and sands of shallow marine origin, belonging to the Norwich Crag Formation and about 1.9 million years old. They are thought to have originated as beach-face and high-energy tidal channel deposits.

Wroxham Crag

A formation of marine sands, silts and clays of early Pleistocene age found in north-eastern Suffolk and eastern Norfolk, deposited between about 1.7 and 0.5 million years ago. It is distinguished from the Norwich Crag by a higher percentage of non-flint, quartz-rich pebbles introduced to the area by the ancestral River Thames and Bytham River.