

West Runton Geology Walks

The Cretaceous

The Chalk was laid down in the Upper Cretaceous and at West Runton is about 73 million years old (late Campanian, Zone of 'Belemnitilla mucronata'). The world was very different then, with higher temperatures, no ice caps but forests at high latitudes. Sea levels were also high and lowland Britain and much of Europe was covered by sea.

Upper Chalk

Upper Chalk is almost pure calcium carbonate, a white limestone composed of detritus from tiny organisms (including coccoliths, which are microscopic plates from single-celled algae). In Norfolk there is over 300 m of chalk which accumulated over 30 million years.

In North Norfolk the Chalk dips gently eastwards and outcrops at West Runton in the lower foreshore. The top of the chalk disappears below beach level under Cromer Pier. Chalk can also be seen in side section in glaciotectionic rafts, under Wood Hill.

Fossils



Though not rich, there is a variety of fossils, both within the chalk and loose. Most common are belemnites, echinoids and sponges, corals, brachiopods, molluscs and bryozoans. Many echinoids are preserved in flint.

Above is an internal view of the test of an echinoid (sea urchin) *Echinocorys scutata* embedded in flint.

Flint and its formation

In Norfolk, flint is everywhere. This tough mineral occurs as layers of nodules within the Upper Chalk and weathers out to become the ubiquitous boulders, pebbles and sand of the beach.



As the Chalk mud accumulated in the Cretaceous chemical changes were occurring below the sea-bed. Oxygen was able to penetrate through burrows and fissures. But this was met by hydrogen sulphide rising from decaying organisms at depth. At a zone of mixing not far below the sea-bed chalk began to dissolve and silica was precipitated from solution as nodules. Flint nodules grew by replacement of chalk. Sponge spicules provided the source of dissolved silica.

Paramoudras

Paramoudras, or pot stones, are large flints that have a central core of hardened chalk 100-200 mm diameter. Often a small hollow and staining is evidence of a central burrow. The normal process of flint formation occurred in a zone around a vertical burrow.



Paramoudras are frequent at West Runton, where their spatial distribution can be seen in the lower beach.



Some flints occur in 'fairy rings', and even multiple rings, occasionally with a 'normal' paramoudra in the centre.

Wroxham Crag

Beeston Chalk

Glacial till



Glacially rafted chalk, with layers of flints under Wood Hill.

See the *Geology Fieldguide to North Norfolk* at www.norfolk.org.uk
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Also, visit the *Poppyland Brewery*, 46 West St., Cromer