

# LOCAL GEOLOGICAL SITES

## TENDRING DISTRICT



### Beaumont Red Crag Outlier

**Site location:** The area of high ground in the vicinity of Beaumont Hall, Beaumont.

**Grid Reference:** TM 180 246

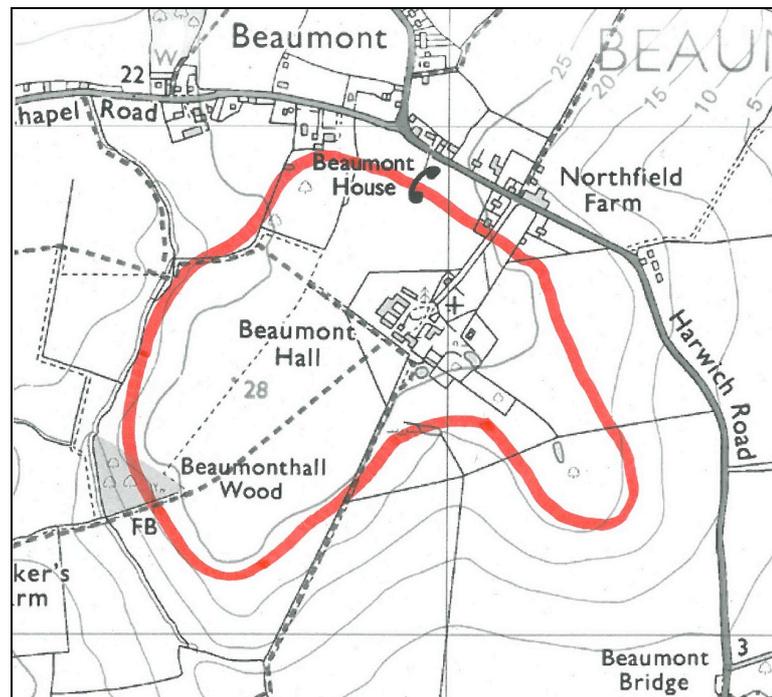
**Status:** Privately owned.

**Summary of the geological interest:**

An isolated patch, or outlier, of Red Crag, about half a square kilometre in size, caps the top of the hill occupied by Beaumont Hall. It is one of very few fragments in Essex of a once continuous deposit of Red Crag across north Essex that has been almost entirely destroyed by erosion. The Red Crag in this part of Essex consists of loose sand with abundant fossil shells and the fossils of other marine animals that lived in the Red Crag Sea that existed about 2.4 million years ago.

The former Red Crag exposures at Beaumont are no longer accessible but fragments of shells can be seen in places scattered on arable fields, such as by the public footpath east of Beaumonthall Wood. Red Crag sand and shells can also often be seen thrown out of animal burrows in the ditch bank alongside the footpath west of Beaumont Hall.

The extent of the site matches, as far as possible, the outcrop of Red Crag at Beaumont.



**Site Assessment.** Local Geological Sites (LoGS) in Essex are assessed using criteria based on DEFRA guidance. An assessment form is used which asks key questions under four value categories: scientific, educational, historical and aesthetic. This site has been assessed and qualifies under these criteria.

## **Scientific interest and site importance**

The Red Crag at Beaumont was first brought to the attention of the scientific world in the middle of the nineteenth century by the well-known Essex geologist John Brown of Stanway, who obtained over 90 species of fossil shells from a pit near the south-eastern extremity of the outlier and privately published a list of them (Brown 1846). At the end of the nineteenth century the amateur geologist Frederick Harmer (1835-1923) carried out a detailed study of the fossils of the Red Crag and re-opened Brown's pit where he succeeded in finding more than 260 species. Most of these were characteristic of the Walton Red Crag but a few were Arctic species which were rare or absent at Walton, indicating that this outlier may be slightly younger than the Walton Crag. With the permission of the landowner Harmer also dug a hole near the south-western limit of the Beaumont outlier which revealed 5 or 6 feet of Red Crag resting on London Clay. With the help of a labourer 7 or 8 tons of Crag sand were sifted, and from this several species were encountered that were not found at the previous pit. Harmer published a detailed account of his work at Beaumont and elsewhere in the Quarterly Journal of the Geological Society (Harmer 1900).

Shelly Red Crag was formerly exposed in the sides of the pond near the church and in other temporary excavations made as part of the running of Beaumont Hall Farm. Farm workers would often come across the typical Red Crag gastropod *Neptunia contraria* that is known as the 'left-handed whelk' because it spirals in the opposite direction to almost all other known gastropods.

Harmer (1900) also records the result of analysis of the mineral content of the Red Crag at Beaumont by treating a 25 gram sample with concentrated hydrochloric acid. What remained was 50% quartz but the other 50% contained a rich assemblage of other minerals, some of which are familiar gemstones. Along with the more common rock-forming minerals such as feldspar and mica were rarer minerals such as zircon, rutile, kyanite, and ilmenite together with yellow crystals of corundum and green and blue grains of tourmaline. There were also tiny red garnets that were so plentiful that the heavy concentrate had a strong pinkish colour. The presence of such minerals in the Red Crag is evidence that these sands were derived from metamorphic rocks, probably from the erosion of the Scottish mountains, and may have been recycled several times over hundreds of millions of years before being deposited on the floor of the Red Crag Sea.

The site therefore has considerable scientific and historical interest.

## **Other information**

All the land is privately owned but the area can be traversed by the public footpaths. No digging is permitted.

## **References**

- BROWN, J. 1846. *A list of fossils from a deposit of Red Crag, in the parish of Beaumont, Essex.*
- HARMER, F.W. 1900. The Crag of Essex (Waltonian) and its relation to that of Suffolk and Norfolk. *Quarterly Journal of the Geological Society*. Vol. 56. Pages 705-743.