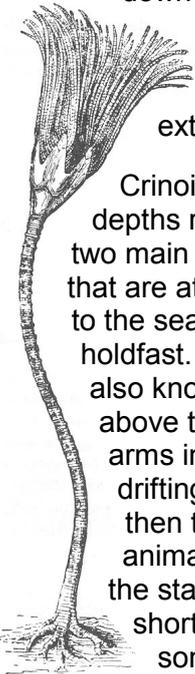


Crinoids at Hook Head, and Thomas Austin

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Crinoids: A crinoid is a marine animal somewhat like a starfish but its mouth faces upwards rather than downwards. Five hundred and fifty-one species of crinoid have been described worldwide. These animals are very rare today; most species occurred in the past and are now extinct.



Crinoids have been found in shallow water and in depths ranging down to 6000 metres. They occur in two main kinds: those that are free-living and those that are attached. Many extinct crinoids were attached to the seabed by means of an anchoring stalk and holdfast. Because they looked like plants they are also known as “sea lilies”. The stalk held the animal above the seabed and the animal waved its flexible arms in the water current to catch tiny prey items drifting in the plankton. These food items were then transferred down grooves in the arms to the animal’s central mouth located in the cup on top of the stalk. Crinoid stalks ranged in length from very short to several metres long. These animals



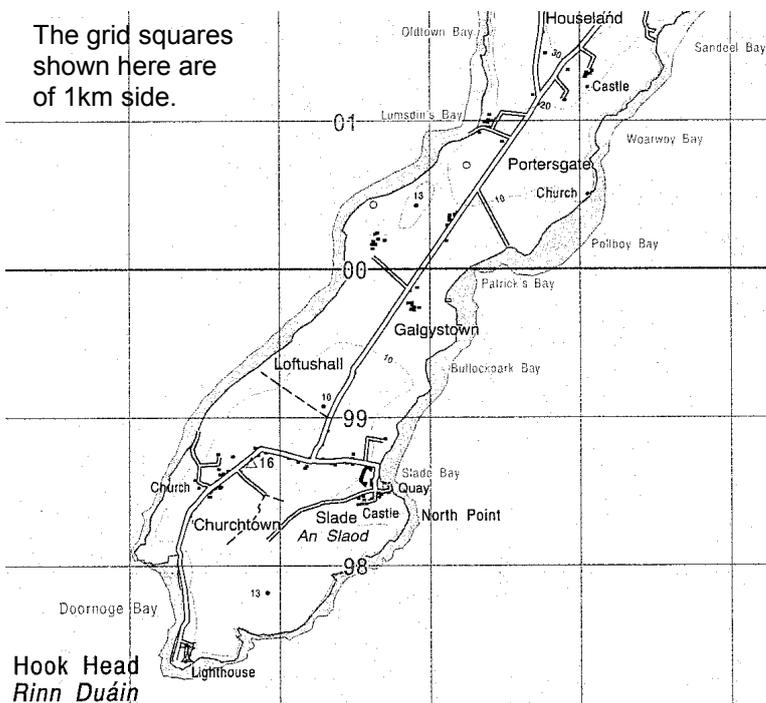
A fossil stalked crinoid or sea lily. The image shows beautifully preserved detail of the top of the stalk (bottom left) with the cup and flexible feeding arms above. It is very rare to find such an intact fossil crinoid. In life the hard parts are held together by the animal’s soft parts; when the animal dies the soft parts rot and the skeleton usually falls apart.

sometimes grew on the sea floor in dense forest-like communities; in appearance, communities of species with stalks of medium length may have been looked somewhat like modern-day fields of cultivated tulips swaying in a gentle breeze.

While some crinoids are anchored by means of a stalk they are able to move. In October 2005, a stalked crinoid was recorded pulling itself along the sea floor off the Bahamas in the Atlantic Ocean east of Florida. Video footage of the animal showed that it was moving at a rate of several centimetres per second in a dash to escape a predator (Baumiller *et al.*, 2005). The video clip of the fleeing crinoid may be viewed at <http://www.newscientist.com/article.ns?id=dn8168>. If attacked by predatory sea urchins, stalked crinoids can also shed part of their stalks in the way a lizard can shed its tail if caught by that appendage by a predator.

The Rosy Feather-star *Antedon bifida* is an example of a modern-day, free-living, local crinoid. In recent years it has been recorded living on the seabed off both Hook Head and Carnsore Point.

The grid squares shown here are of 1km side.



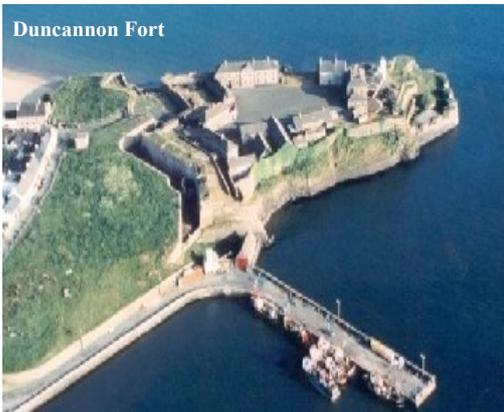
Hook Head: Hook Head, the tip of the long, low peninsula that forms the eastern flank of Waterford Harbour, is famous for its fossils especially its crinoids.

Specifically, the Hook is a key locality for the study of the Tournaisian fauna of northwest Europe.

The Tournaisian is a point in geological time some 350 million years ago. At that time northwest Europe lay on the floor of a warm sea. Extensive communities of stalked crinoids thrived in the warm waters. Fossils of the animals, or fauna, that lived in that warm sub-tropical sea are beautifully preserved in the limestone rocks at the Hook.

Hook Head is a site of international importance for the study of marine life dating from that ancient time.

Thomas Austin: People have probably always admired the fossils at Hook Head since the first hunter-gathers noted them on the foreshore rocks. History credits Thomas Austin as the first person to study them in any detail. Austin, an Englishman, was born in 1794. As a boy of fourteen years he joined the British Army and was commissioned in the Middlesex militia. At a military engagement in 1814, during the Battle of Merxem, outside Antwerp in Belgium, he was struck by a cannon ball and as a result had his left leg amputated at the tender age of nineteen. He continued his military career on a peg leg, a wooden prosthesis.



Austin was appointed Fort Major at Duncannon Fort in south County Wexford and served there as commander from 1820 to 1839 or 1840. A keen follower of shooting and other country pursuits, Austin explored the environs of the fort. He discovered the fossil beds at Hook Head and started a collection of crinoids. After his military career he settled in Bristol. He became a distinguished geologist and author of geological works. Other works of his include *The Wounded Soldier's Dream; The Emigrant; Prince Charles, and Other Poems* (London 1848); and *Old Stick-Leg: Extracts from the Diaries of Major Thomis Austen*, arranged by Brig.-Gen. H. H. Austin. His very extensive fossil collection is now divided between Bristol City Museum, the British Geological Survey, Liverpool City Museum, and the Natural History Museum, London.

In the period 1843-1847, Thomas Austin and his son Thomas Junior, wrote a remarkable, though unfinished, monograph on fossils based on the Hook Head material together with other published (Austin and Austin, 1842 etc.) and unpublished papers (Ausich *et al.*, 1999).

Thomas Austin Senior, pioneer of fossil crinoid studies at Hook Head died in 1881 at the age of 87 years. He was predeceased by his son, Thomas Austin Junior, who was born in 1817 (Sevastopulo, 2002 and http://www.pgil-eirdata.org/html/pgil_datasets/authors/a/Austin,T/life.htm). Studies of the fossil crinoids at Hook Head have continued to this day and have been carried out by several palaeontologists over the years. Recent detailed studies have been carried out by Professor William Ausich of The Ohio State University in the USA and Dr George Sevastopulo in the Department of Geology at Trinity College, Dublin (Ausich and Sevastopulo, 2001).

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The image above shows two species of fossil stalked crinoids preserved in the Carboniferous limestone at Hook Head. The intact crown belongs to *Platycrinites*, while the large stem is part of another crinoid called *Amphoracrinus*. (Photograph: *Fossils of Northern Ireland: Crinoids on the Ulster Museum Habitas website* at <http://www.umsciences.org.uk/fossils/crinoids.html>).