FOSSILS IN THE LIMESTONE

The most common fossils in the limestone are corals (Fig. 1A), brachiopods (a type of shellfish) (Fig. 1B), snails (Fig. 1C) and crinoids (a relative of starfish) (Fig. 1D).



Fig. 1. Common fossils in the limestone, from left to right: corals, brachiopods, snails, and crinoids.

(A) CORALS

Corals are common in the limestones of the Burren, and are often concentrated at specific levels in the limestone. Corals are still alive today, and form great reefs in shallow tropical waters. They can grow in colonies, or live independently as a solitary coral. Colonial corals often have a branching growth pattern (Fig. 3). They have a hard skeleton made from calcium carbonate that gradually grows upwards; the living animal (the polyp) sits at the top of the skeleton and gathers food using tentacles. Modern shallow-water corals carry symbiotic algae that produce food by photosynthesis.



Fig. 2. Modern colonial coral polyps.



Fig. 3. Branching growth pattern of colonial coral.

CORALS CTD.

During the Carboniferous, corals did not form reefs. Most of the corals in the Burren limestones lived in a colony, but there are some solitary corals also. Where present, the corals show that the sea was shallow enough to allow sunlight to penetrate the water to allow algae to photosynthesise. The colonial corals have a branching growth pattern; each branch is usually 4-8 mm wide. Like crinoids, corals appear differently depending on the way the piece of limestone has broken. If the corals are cut in cross section, each branch appears as a small circle with white lines radiating out from the centre, like the spokes of a bicycle wheel. If the corals are cut in long section, they appear as long pencil-like features.



Fig. 3. Corals in the Burren. A: colonial coral. B: close-up view of coral branches in cross-section. C shows a cut face of limestone exposed on a step. You can see how the coral's branches look circular on top of the step (where they are in cross section) but look like long pencils on the side of the step (where they are in long section).



In some corals in the Burren, the branches touch each other. These corals are called cerioid corals and are a different species to the others.

They are very important for dating the age of the Burren limestones. Here you can see a cross-section of one of these corals.

(B) BRACHIOPODS

Brachiopods, or "lamp shells", are very common fossils in the Burren limestones. They are a type of shellfish with two valves and are still alive today. They live attached to the sea floor by a tough ligament-like stalk, and feed by filtering tiny particles of food (e.g. plankton) out of seawater.



Fig. 1. Modern brachiopods.



Fig. 2: Fossil brachiopods of the Burren limestones.

Like the corals and crinoids, fossil brachiopods can look different depending on the way the block of limestone has been broken. In cross section, the valves of the shell look like large white circles (Fig. 2A). In long section, the valves of the shell look like white semicircles (Fig. 2B). Most of the time, though, you see not two but only one value of the shell. This is because the two valves are held together in life by ligaments, which decay after the animal dies. With nothing holding the two valves together, the valves are easily separated by any currents passing over the sea floor.

(C) CRINOIDS



Fig. 2. Modern crinoid in the Pacific near Japan.

Crinoids are still alive today; they have a radial array of feathery arms on top of a vertical stem. They are animals, and use their feathery arms to pick or pluck food particles from the seawater and place it in their mouth. Their skeleton is composed of many tiny circular pieces, held together during life by ligaments and skin (Fig. 3A). After the animal dies, these soft tissues decay and the pieces of the skeleton fall apart (Fig. 3B). The pieces are then scattered by currents (Fig. 3C). Hence the only remains of crinoids that we see in the limestones of the Burren are scattered white circular structures, about 2-10 mm wide.



A: piece of crinoid stem in life, held together by ligaments (pink) and skin (dashed line) B: after death, the ligaments and skin decay, and the pieces of the stem start to separate C: the pieces of the skeleton are scattered by currents

The fossil crinoids can appear differently, depending on the way the block of limestone has broken and the orientation of the crinoid pieces within it. Where the crinoid pieces are cut in cross section, they appear as scattered white circular structures, about 2-10 mm wide (Fig. 3A). Where they are cut along their length, they appear as two parallel white lines with a jagged edge where they face each other (Fig. 3B).





Fig. 3. Crinoids in the Burren limestones.

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