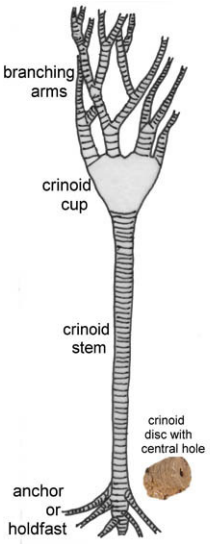
FOSSILS: ADDITONAL INFORMATION

The ***Earth-Science On-Site*** visit is to outcrops of limestone deposited in shallow sea areas washed by waves and currents. These are so called "lagoons", but there are also the "reef" type exposures with its surrounding sediments and fauna. Three main types of animal are commonly found as fossil evidence; crinoids, corals, and brachiopods. All three live on the sea floor, and are filter feeders, although otherwise they are very different.

Figure 1. A Crinoid



Crinoids are common fossils in these rocks. See Figure 1.They are of the phylum Echinodermata, and so are relatives of sea urchins and starfish. They have a cup shaped body with a mouth in the upper surface, surrounded by five branching arms. The arms filter food from the seawater and pass it down to the mouth. The body is attached to the sea floor by a stem that extends from its underside. The exoskeleton (outside the soft parts) is made of calcite plates, the stem and arms are made of calcite discs, shaped rather like polo mints, with a "hole". After death the connective tissue and muscles decay and stems fall to the sea floor. If they are not transported far they can remain in quite long pieces, but usually the discs come apart into shorter lengths, when transported by waves and currents. Short, broken lengths of stem or arm discs are the most commonly found fossil of crinoids. This means they are not found fossilised in the position in which they lived, called the "life position", although those at the Reef Quarry seem almost to have lain where they fell. Few "cups" are found fossilised, either because they broke free at an adult stage in the life cycle, or were eaten by large swimming animals.

Figure 2. A Single Coral

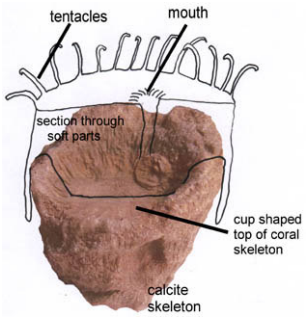
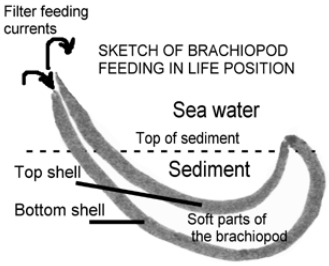


Figure 3 A Colonial Coral

Corals are fairly common fossils in these rocks. They are of the phylum Cnidaria, and have a soft body with arms which filter food from the water and pass it to the central mouth. The outer wall of the coral is of calcite that the coral builds up from the sea floor as it grows. It is roughly tubular or conical in shape with internal calcite walls and a shallow cup at the top in which the soft parts sit. After death the soft parts decay and the calcite skeleton may be washed around by currents. Often these fossils are found in horizontal positions, showing that they are not in "life position".
The importance of corals is that they can form large colonial growths, called reefs, and provide a rich habitat for many other species. In reef type outcrops the corals are often found in "life position". They are indicative of shallow warm seas, which are well oxygenated, and carrying plenty of food, and very little mud.

Figures 4 & 5. A Brachiopod



Brachiopods are very common in these rocks. They are of the phylum Brachiopoda, and are shellfish. They have two calcite shells which fit closely together, opening slightly to allow currents of water, carrying food and oxygen to be wafted in to keep the animal alive. They are filter feeders.

The most common brachiopod at this site is quite large, often several centimetres across. Its shape resembles the bowls of two spoons the concave side of one, fitting into the convex side of the other, leaving a tiny curved space for the animal between. It lived on the seafloor with the concave upper side becoming concealed beneath a thin layer of sediment. Quite often several specimens can be seen in the rock all the same way up, suggesting that these were preserved in "life position", although it is also common to find the shells scattered and separated by the currents.