The gentle anticlinal fold can be seen in the cliffs (see picture on front cover of this leaflet) and this is the trap structure in which the oil has collected and is now exploited.

The limestone beds seen in the cliffs and on the wave cut platform on the beach were formed from blooms of planktonic organisms living in the Jurassic sea. They had carbonate rich remains which were preserved on the sea floor when the creatures died. The Kimmeridge ledges, seen in the picture below, result from harder beds of rock which are more resistant to weathering and erosion and also because of the gentle dip of the rock strata. Marine life has colonised the sheltered water between the ledges.

There are faults, fractures in the rock, along which mineral crystals can be seen especially calcite.

Hammering at Kimmeridge is not permitted, enforced by wardens, so you will have to confine your attention to the loose rock material on the beach.

USEFUL RESOURCES:

Maps: Ordnance Survey 1:25,000 Outdoor Leisure 15, Purbeck and South Dorset.

British Geological Survey Map Sheet 343 Swanage.

Books: Geology of the Dorset. Michael House. Geologists' Association.

Coast and Country Geological Walks in and around Dorset CD. DGAG

Mesozoic Fossils. British Museum (Natural History). This book is very useful for identifying many of the fossils found along the Dorset Coast and East Devon Coast.

Websites:

dorsetgeologistsassociation.org

jurassiccoast.org

southampton.ac.uk/~imw

Email alan_holiday@btinternet.com

WORLD HERITAGE COAST LOCATIONS:

KIMMERIDGE

VERY WELL PRESERVED FOSSILS AND THE FORMATION OF OIL.

The Kimmeridge Bay cliff looking west, showing the gentle dip of shale and limestone beds part of a shallow anticline (dome shaped fold).

WHAT'S SPECIAL ABOUT THE COAST AT KIMMERIDGE?

Kimmeridge is one of the world class fossil sites along the World Heritage Coast and one of the few easy access points to the coast between Lulworth Cove and Swanage. The Kimmeridge Shales exposed in the cliffs and on the foreshore contain very well-preserved fossils, but great care is needed when collecting them. Only loose specimens should be collected, no hammering is allowed. One of the best ways to see the fossils is in the Etches Collection in the village of Kimmeridge. The rock is also important because it is the source rock for much of the United Kingdom's oil. Similar rocks are found under the northern North Sea. The marine wild life is also interesting hence the waters around Kimmeridge form a marine nature reserve (visitor centre in Kimmeridge Bay).

HOW TO GET THERE:

1. Location: On the coast between Lulworth Cove and Corfe at GR SY 909789.

2. Access is gained via a private toll road from Kimmeridge village which can either be reached from Lulworth or from Corfe. It should be noted that the road from Lulworth goes through the army firing range and access is not always possible from the west.

3. Facilities. There is a café in the village and toilets at the car park at Kimmeridge Bay

HEALTH & SAFETY

The cliffs are made of thinly bedded shale and rock falls can occur. Walking to the west is restricted because of entering the Lulworth Army Ranges. Access to the beach sections can be tide dependent so a falling tide is recommended. Information on tides can be obtained from the marine reserve centre. The rocks on the beach can be slippery so care should be taken when walking on them. **Hammering of the cliffs is not permitted.**

THE GEOLOGY

The rocks exposed in Kimmeridge Bay are the Lower Kimmeridge Clay of late Jurassic age and generally the rocks dip gently to the east meaning the rocks get progressively younger as you walk eastwards. The rocks are a mixture of thinly bedded clay rocks called shale with some more thickly bedded limestone units. The rocks were deposited in relatively deep water on the continental shelf in low energy conditions. This meant that there was often a shortage of oxygen on the sea floor so any creature living in the surface water had a good chance of being preserved in the fine-grained mud when they died. This means that it is possible to find very well-preserved fossils including fossil fish and ammonites.

The shales are dark in colour because of organic material such as plankton preserved in them. You can smell the odour of oil in freshly broken pieces of shale especially from those beds known as oil shale. The Kimmeridge Clay is one of the main source rocks for the United Kingdom's petroleum resources. The oil and gas has moved from this source rock into permeable reservoir rocks where the oil can be pumped to the surface. There is an oil well at Kimmeridge but the oil is being extracted from a deeper level in the Jurassic rocks under Kimmeridge. The well has been producing small but economic amounts of oil for over 50 years, with a road tanker collecting the oil two or three times a week.

The nodding donkey pump at Kimmeridge.