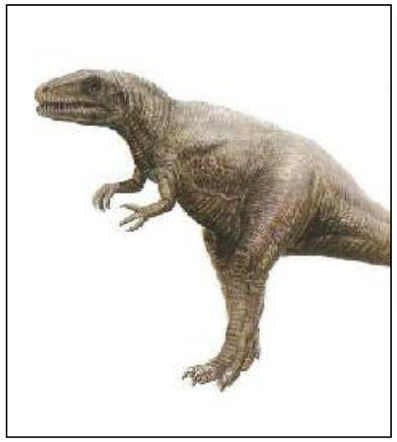
DINOSAURS AT HUNTSMANS



At Huntsmans Quarry you are standing where dinosaurs used to roam. Fossils of the footprint of a Megalosaurus can be seen at Huntsmans Quarry's Site of Special Scientific Interest.

MEGALOSAURUS

The rocks exposed in our Naunton quarry record some 180 million years of geological time. The exposure of Cotswold slate has yielded a rich and diverse collection of fossils including footprints and vertebrae belonging to a Megalosaurus—a carnivore that walked on two legs. In 1676 Megalosourus fossils were one of the first dinosaur fossils ever discovered .

The Megalosaurus was 9 – 10 metres long and 10 metres tall and weighed a tonne. It had a large head with curved sawedge teeth on a short, strong neck. Strong arms and powerful legs ending with sharp claws helped it catch its prey.

Some vigilant members of our team spotted the footprints and rescued them during our normal quarry operations.

The Geology at Huntsmans has been used as a geodiversity case study on the Goodquarry website: www.goodquarry.com

This website focuses on promoting good practice within the quarrying industry and is used as a source of helpful information by those within the industry (operators, planners, consultants etc.) and by the members of the public who may be affected by a quarry and is also proving to be a valuable educational resource.

Further information on Huntsmans Quarries can be found at their website: www.huntsmansquarries.co.uk

A SIMPLIFIED GEOLOGICAL HISTORY OF THE QUARRY AND LOCAL AREA

From a knowledge of the geology, it is possible to create an intriguing history of this local area, which, over a period of some 200 million years, has experienced warm shallow seas, volcanic activity and glacial conditions.

Deep boreholes, supplemented by geophysics, drilled to explore for coal, gas and oil have proven, at significant depth, thick sequences of volcanic materials and marine sediments dating back as far as the Precambrian Age (600 million years ago). Thereafter, by late Carboniferous times (290 million years ago), the Cotswold area comprised an area of broad floodplains that gave rise to muds, silts, sands and thin coals being deposited. By the Permian Period (250 million years ago) the entire region became a desert with sand dunes and windblown silts and muds becoming the norm. Sea level rises throughout the Triassic period (210 million years ago) created shallow sea conditions at the start of the Jurassic period (190 millions years ago), which marked the beginning of the formation of the local rocks that are exposed today.

By now the climate was warm with shallow tropical seas stretching from the Dorset coast to North Yorkshire and, as a result, a thick sequence of limestone rocks was deposited, resulting from an accumulation of dead organisms, such as shells, sea urchins and ammonites in association with a precipitation of carbonate rich salts from within the sea water. On close examination, the limestone often exhibit shelly fossil fragments. With the aid of a magnifying lens, small distinctive ovoid shaped particles can be observed, which are called ooliths – hence, these rocks are referred to as "oolitic limestone". These ooliths form as a series of concentric growths of calcium carbonate and algae around a nucleus of a sand grain or shell fragment that has been agitated by sea currents.

Frequent changes in sea level occurred during this period of geological time, often creating local lagoonal or intertidal conditions, resulting in the deposition of marls, muds or sands. Such conditions must have occurred in the vicinity of Huntsmans Quarry - as proven by dinosaur footprints discovered during quarrying operations. These footprints are believed to have been made by a Megalosaurus (meaning "Great Lizard"). At other times during the Jurassic period, deeper marine environments also occurred, giving rise to the formation of Fullers Earth Clays. These rocks comprise bluish grey, fissile mudstones with interbedded thin slabs of siltstones and fine-grained limestone, often containing small oyster and other bivalve shell fossils. Up until the end of the 19th Century, such materials were traditionally used, with a mixture of water and urine, to degrease sheep wool – due to the highly absorbent properties of smectite minerals within the clays. These smectite minerals are believed to have been formed by the alteration of volcanic ash deposited in deep seawater.

Towards the end of the Jurassic period, which had lasted for some 60 million years from 195 to 135 million years ago, due to tectonic uplift, much of Britain became an extensive landmass. Exploration boreholes at Huntsmans Quarry have confirmed that faulting took place, displacing the rock strata in the south-western part of the quarry still to be worked. Exposures of such features are relatively uncommon in the Cotswold area and it is intended, therefore, to retain parts of the quarry faces where this feature occurs, as part of the final restoration proposals for the quarry to supplement the geological Site of Special Scientific Interest already in existence at Huntsmans Quarry.

The final major geological event in the Cotswolds occurred a mere 400,000 years ago, when ice sheets deposited glacial tills and outwash materials accumulated to the south of Moreton in the Marsh.

HUNTSMANS QUARRIES LIMITED

GEOLOGY AND HUNTSMANS QUARRIES

Huntsmans Quarries Ltd is a small, private limited company that has operated in the Cotswolds for in excess of 70 years. Its local quarries supply a wide variety of construction materials, including roadstone, concrete aggregates and more traditional products, such as dressed building stone, walling and paving stone and roof slates. The production of agricultural lime is also important both locally and regionally.

Being a local company, Huntsmans appreciate the value of being a constituent part of the Cotswold Area of Outstanding Natural Beauty and actively seek to promote the geological interest of this area whenever opportunities arise.

Huntsmans have created three Sites of Special Scientific Interest at Naunton, Beckford and Hornsleasows. Liaison with the Gloucestershire Geoconservation Trust has resulted in the commissioning of an explanatory notice board at Huntsmans for the general public's enjoyment and benefit.

Huntsmans Quarries Ltd had a series of cored boreholes drilled to investigate in detail the geology of its main operational site at Naunton. Good geological knowledge enables the future development of the site to be planned to match the different lithological units (rock types) to its varied end products. In addition, as a result of this work, it has been decided that, on completion of extraction, the final restoration proposals are to feature additional rock cliff exposures of geological interest.

SSSI AND INFORMATION BOARD AT HUNTSMANS QUARRY

PAUL BREWER GEOLOGICAL SERVICES LIMITED