



## South Wales RIGS Group Site Record

### RIGS Description

**SECTION A**

General	South Wales
<b>Site Name:</b> Duchy Quarry	<b>File Number:</b> Site_VOG_287
<b>RIGS Number:</b> 704	<b>Surveyed by:</b> Gareth Owen
<b>Grid Reference:</b> SS 9060 7570	<b>Date of Visit:</b> 11 <sup>th</sup> August 2009
<b>RIGS Category:</b> Educational, scientific	<b>Date Registered:</b>  <b>Owner:</b> Unknown <b>Planning Authority:</b> Vale of Glamorgan Council
<b>Earth Science Category:</b> Palaeontology	
<b>Site Nature:</b> A disused quarry in the Alun Valley currently used for clay pigeon shooting.	<b>Documentation prepared by:</b> Gareth Owen
<b>Unitary Authority:</b> Vale of Glamorgan Council	<b>Documentation last revised:</b> 1 <sup>st</sup> March 2011
<b>OS 1:50,000 Sheet:</b> 170	<b>Photographic Record:</b> Attached
<b>OS 1:25,000 Explorer Sheet:</b> 151	
<b>BGS 1:50,000 Sheet:</b> E262	
<p><b>RIGS Statement of Interest:</b></p> <p>This disused Carboniferous Limestone quarry is one of several quarries in the area that are characterised by deep fissures that have been infilled by Late Triassic/ Early Jurassic red muds. These muds yield a range of vertebrate fossils, providing an excellent resource for research into early mammals. Species described include the primitive prototherian and primitive therian mammals (<i>Morganucadon watsoni</i>, <i>Kuehneotherium praecursus</i> and <i>Kuhneon duchyense</i> – the most primitive and earliest mouse-like mammals known).</p>	

**Geological setting/context:**

Throughout the Vale of Glamorgan there is a complex unconformity between the Mesozoic and underlying Palaeozoic rocks, with differing members of the Mesozoic succession resting on various parts of the Palaeozoic sequence. Prior to deposition of the Mesozoic sediments, the Palaeozoic rocks were folded and faulted during the Variscan mountain building episode, forming an open anticline with an E-W trending axis through the Vale of Glamorgan from north Cardiff to Porthcawl. The core of the fold was eroded during Permian and Early Triassic times progressively exposing the sequence of rocks from middle Carboniferous down to Silurian. Because of its relative hardness the Carboniferous Limestone on both limbs of the anticline formed ridges, whilst the generally softer Devonian and Silurian produced lower lying areas. Where the limestone was exposed along the ridges, a complex system of fissures formed due to dissolution by rain and groundwater.

Mesozoic rocks were then deposited on this landscape from the Triassic up into the Jurassic. The early sediments accumulated on an arid land surface, filling the fissures in the Carboniferous Limestone with red muds and clays, and filling topographical lows with boulder beds. Deposition continued up into the Rhaetian, which saw the transition from arid terrestrial to shallow marine environments.

Within the red muds and clays washed into the fissures are found fossils, including examples of plant, mammal and insect life.

**References:**

DAVIES, J H. 2000. *Site Management Report Series: Bridgend Quarries (Duchy Quarry)*. CCW Internal Report.

BENTON, M J, COOK, E, HOOKER, J J, 2005. *Geological Conservation Review Series: Mesozoic and Tertiary Fossil Mammals and Birds of Great Britain*. JNCC

## SECTION B

### PRACTICAL CONSIDERATIONS:

Please score Accessibility and Safety Red Amber or Green

#### Accessibility:



Comment: Easily accessed along track from public road that runs down the Alun Valley.

#### Safety:



Comment: Whilst the faces are generally stable, there is an inherent risk of rockfall in any disused quarry.

**Conservation status:** This site has been registered as a GCR site, and as such is proposed SSSI. The site lies within Old Castle Down SSSI, which is notified because of its grassland plant communities, and the long term aim is to re-notify the site to include the geological interest. Designation as RIGS will provide awareness of the importance of this site until such time as SSSI status is achieved.

### OWNERSHIP/PLANNING CONTROL:

**Owner/tenant:** Unknown

**Planning Authority:** Vale of Glamorgan

**Planning status/constraints/opportunities:**

### CONDITION, USE & MANAGEMENT:

**Present use:** Clay pigeon shooting

**Site condition:** Good. The quarry faces are slowly becoming colonised by vegetation, but the presence of fissures can still be easily studied. The clay infill is slowly being washed out by rain.

**Potential threats:** Vegetation growth

**Site Management:** None

### SITE DEVELOPMENT:

**Potential use (general):** Of use for scientific purposes, although the active quarries nearby will yield more fresh fossil finds

**Potential use (educational):** Of most use for education purposes – the presence of fissures, their origins and infilling provides a useful teaching resource, particularly for school and A level students.

### Other comments:

A useful adjunct to the active Ewenny Quarry and Pant Quarry, this allows study of the lithologies and fissures in a safer environment.

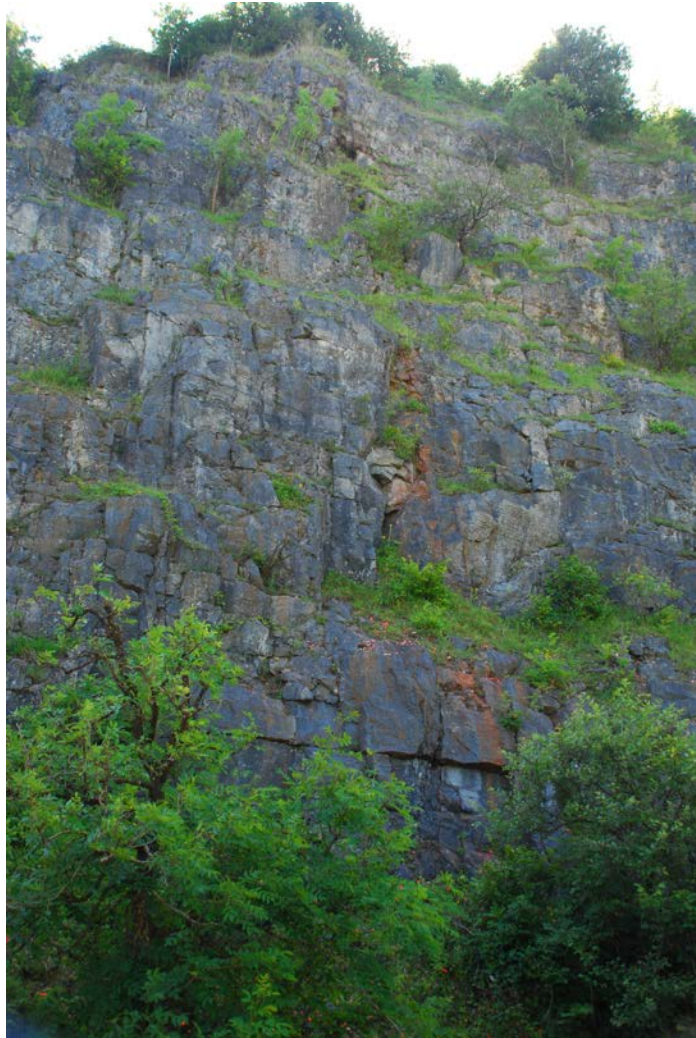
## Photographic Record



Photograph 1: General view of the quarry looking north-east



Photograph 2: A close-up of the red mud and clay filling one of the fissures in the northern end of the quarry.



Photograph 3: A fissure streaked with red Triassic muds at the southern end of the quarry