Holwell and Nunney

The village of Holwell is renowned by palaeontologists for the discovery in 1867 of one of the world's earliest mammals. Holwell is a small village on the A361, south-east of Frome, situated in a narrow valley where the Nunney Brook has cut into the Carboniferous Limestone. The limestone here has been quarried for over 150 years, creating a complex of active and abandoned quarries on either side of the A361. These quarries [88] [ST 72587 45272] are important geological sites and have been designated as a Site of Special Scientific Interest.

The Carboniferous Limestone here dips to the south at about 20°–50° and is cut by many vertical fissures lined with large calcite crystals.

These fissures, which are also known as ‘Neptunian dykes’, are infilled with younger, Triassic and Jurassic sediment. They developed as 'pull- apart' structures along joints in the limestone when the Mendip region was subject to tectonic extension in Late Triassic and Early Jurassic times. It has been estimated that the region has been extended by about 4.7 per cent during this time.

Neptunian dykes

1. The Carboniferous Limestone is folded into a large upfold, known as the Beacon Hill Pericline, and eroded during the Triassic.
2. Regional extension in Triassic times causes fissures to open up in the Carboniferous Limestone. These are infilled with land- derived sediment, mostly red mudstone.
3. As extension continues, a shallow sea floods over the area towards the end of the Triassic, creating the Mendip archipelago. Marine sediment infills the fissures.The remains of reptiles and rare mammals derived from nearby islands are swept into these fissures. Eventually, the region is buried beneath the Inferior Oolite.

This type of fissure was first described from here in 1867 by Charles Moore after a visit to Holwell Quarry by the British Association in 1864. In the sediments infilling the fissures, Moore discovered the remains of one of the earliest known mammals. After sieving through three tons of fissure sediments, he found over 45 000 fish teeth and 27 tiny teeth of a mammal known as *Haramiya.* A further 19 teeth were found by the German palaeontologist Walter Kuhne in 1939. The fissure fills have also yielded vertebrate fossils of Late Triassic age as well as fragments of Jurassic reptiles and the dinosaurs *Thecodontosaurus* and *Palaeosaurus*.

North of the A361, the crags on the east side of the valley expose the Oxwich Head Limestone. Close by, a roadside exposure [730 449] on the slip road towards Frome [89] [ST 72940 44954] shows the unconformity between the Jurassic Inferior Oolite and the underlying Carboniferous Limestone. The Inferior Oolite is conglomeratic at the base and contains many fossil corals, gastropods and bivalves.

Just north of Holwell, at the end of a minor lane, is a long-disused quarry [90] [ST 72923 45148] now used as a private car park for the nearby cottages.

Here a large east–west-trending fissure in the Carboniferous Limestone is exposed along the length of the quarry wall. The fissure was filled with red and yellow-coloured sediments of Triassic and Early Jurassic age and broken blocks of Carboniferous Limestone, which probably fell in as the fissure opened. Late Triassic fish remains have been discovered in the fissure fill. The rocks here are veined with calcite and baryte, and some cavities are lined with well formed calcite crystals.

In the valley floor there are a series of springs known as Holwell Risings [91] [ST 72893 45050], which drain the region to the west. Some of the water has been traced from stream sinks in the Downhead area (see Torr Works).

The active quarries at Holwell comprise four pits clustered around the village, divided by the A361 and minor roads. Three of these pits are connected by two tunnels. A fifth pit, known as Cloford Quarry, lies about 500 m to the

south-west. The quarry produces around 600 000 tonnes of aggregate each year for a range of materials used as concrete products, and in the building and construction industries. Jurassic Inferior

Oolite rests on Carboniferous Limestone in this area, and is stripped off by the quarry company, thus revealing the unconformity surface and the Carboniferous Limestone below. This is the same unconformity seen in Vallis Vale and Tedbury Camp Quarry. A viewing platform [92] [ST 72248 45430] has been built overlooking the northern pit [722 454]. Parking is available in the lay-by on the road nearby. From here, there is a fascinating view both of the quarry activity and the undulations of the unconformity.

The unconformity is also well exposed in the road cutting 0.5 km to the north-east [93] [ST 72690 45594]. Here, a small knoll of dark grey Carboniferous Limestone is overlain by the golden yellow Inferior Oolite. The northern side of the knoll is bounded by a small fault, downthrowing the Inferior Oolite against shattered Carboniferous Limestone. The Inferior Oolite here is cut by many calcite-lined fissures.

In the centre of Nunney are the impressive remains of Nunney Castle [94] [ST 73668 45729]. Built at the end of the 14th century by Sir Elias de la Mere, it was besieged by Cromwell's troops during the Civil War and was dismantled in 1654. The castle is constructed mostly of local stone, principally the Jurassic Inferior Oolite from quarries at Doulting and the Great Oolite Group around Bath. The castle is owned by English Heritage and is open to the public.

Several possible ‘sarsen’ stones occur at the end of the lane between the castle gate and the footbridge. Sarsens are boulders of silicified sandstone which were used in the construction of Stonehenge. These boulders, of Palaeogene age, are the remnants of an outcrop that was once more extensive and long since eroded away.

North-west of Nunney is a disused quarry [95] [ST 73443 45769] which has been turned into a small park. Here the Vallis Limestone is well exposed in the face at the rear of the quarry. A short distance north of Nunney Castle are the remains of one of the six iron works [96] [ST 73646 45999] owned by the Fussell family. The works here manufactured edge tools such as scythes, spades and shovels. All that remains now is a jumble of ruined buildings and a millpond. The site was sold in 1846, when 30 people were employed there.

Figures

(Figure 88) Aerial photograph of the Holwell and Nunney area.

(Figure 89) Map of the Holwell quarries, showing the location of the Triassic and Jurassic fissures.

(Figure 90) Neptunian dykes schematic.

(Figure 91) A fissure in the Carboniferous Limestone, infilled with Triassic Mercia Mudstone. Cloford Quarry. © Michael Simms.

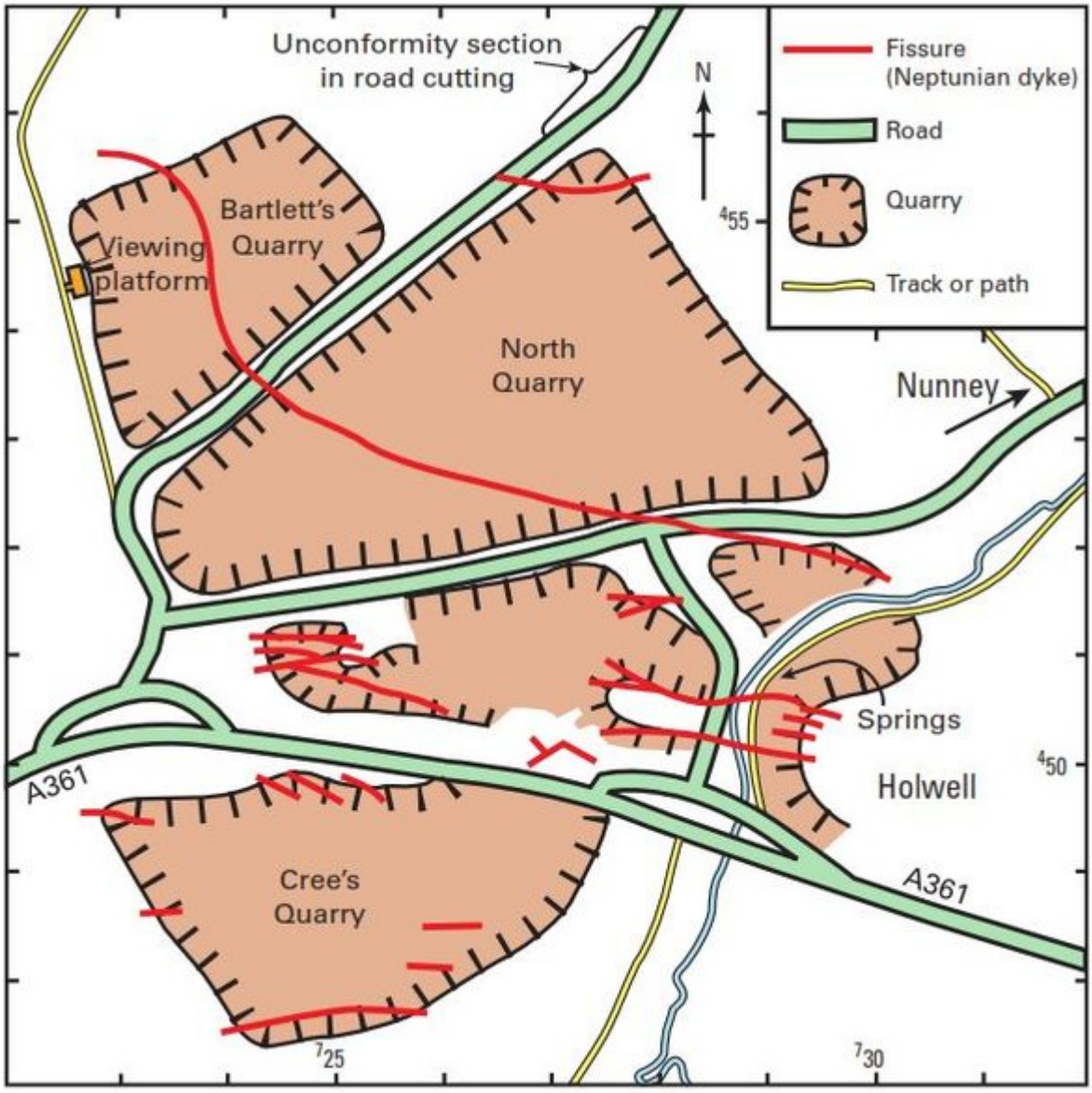
(Figure 92) Haramiya, one of the earliest known mammals.

(Figure 93) Haramiya teeth.

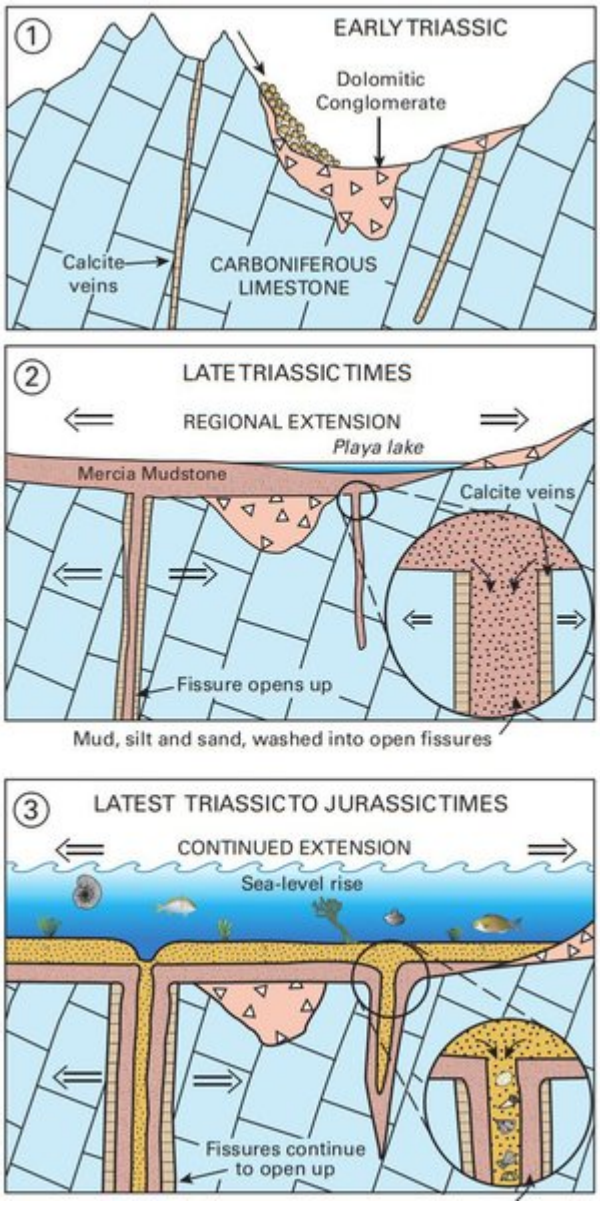
(Figure 94) Sketch of the Jurassic unconformity exposed on the Holwell–Whatley road.

(Figure 95) Nunney Castle.

(Figure 88) Aerial photograph of the Holwell and Nunney area



(Figure 89) Map of the Holwell quarries, showing the location of the Triassic and Jurassic fissures.



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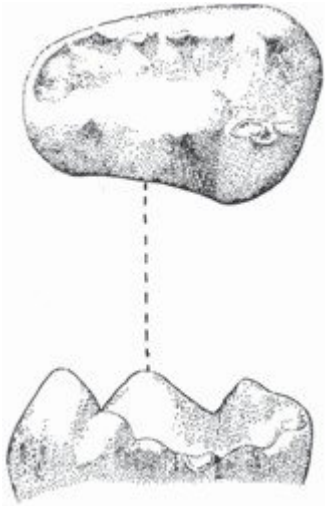

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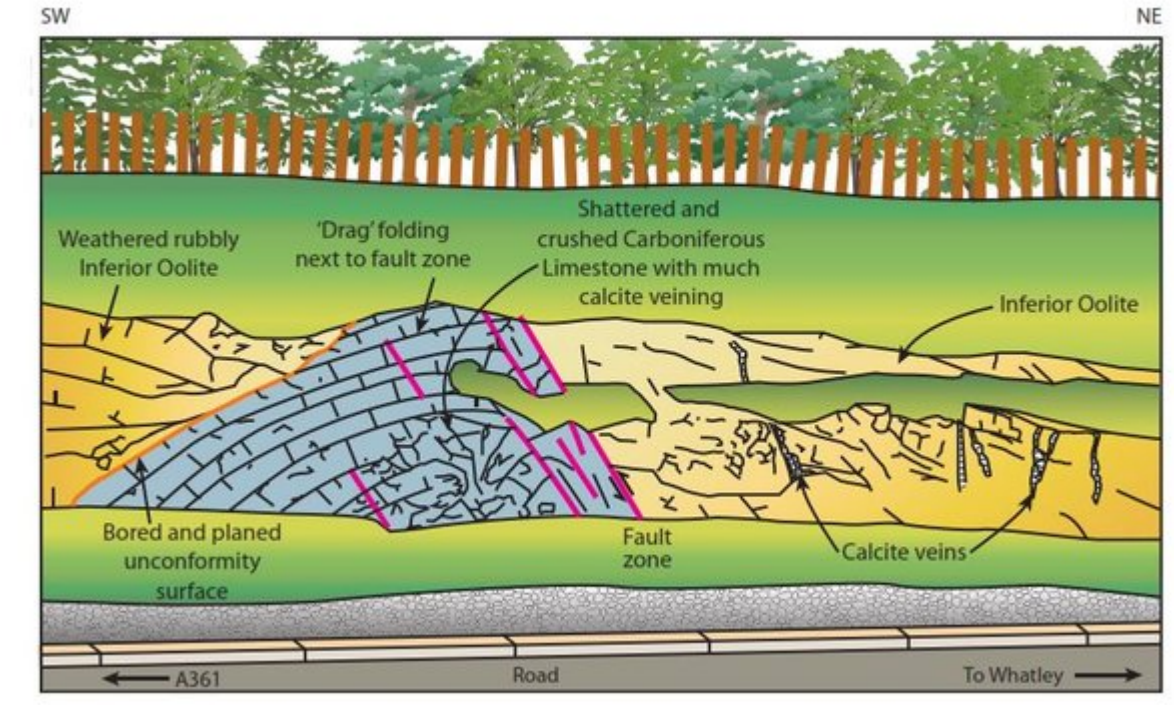

(Figure 94) Sketch of the Jurassic unconformity exposed on the Holwell–Whatley road.

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