Banwell Ochre Caves, Avon

[ST 407 593]

Introduction

Banwell Ochre Caves are situated 2.5 km east of the Banwell Caves GCR site, to the east of Banwell (see (Figure 6.1)). The ochre caves are important for the extensive yellow ochre workings that they contain. They have been chosen as the type site for yellow ochre and limonite because they are open and fairly extensive, and a variety of ochre types and iron hydroxides can be examined *in situ,* allowing the genesis of the ochre and iron deposits to be investigated. There is no literature on the mineralogy of the Banwell Ochre Caves, and the following description is therefore based on unpublished material from W.I. Stanton (pers. comm.).

Description

Banwell Ochre Caves consists of five groups of natural phreatic tunnels in Carboniferous Limestone, from which the ferruginous floor deposits have been partly removed. They were worked for their content of yellow ochre from 1935 to 1950, and some evidence of mining remains.

The floor deposits were up to 5 m thick and consisted largely of unsorted stony earth and clay, including a variable proportion of yellow ochre and brown limonites. In one cave laminated deposits of fine sand, composed of well-rounded quartz grains, appear to be interstratified with the stony earth. In an unconfirmed report, late Pleistocene bones were found in the stony earth layers in one of the caves.

The brown limonites mostly occur as lumps up to 0.5 m in size, with a rough stalactitic, coralline, cellular, porous or encrusting internal structure. Formed by the oxidation of pyrite, either *in situ* or by deposition from iron sulphate or carbonate solutions, the lumps of brown limonite are broken pieces of larger masses. In two of the caves, residual accumulations of these lumps, 5 m or more across, occupy depressions in the limestone surface below the subsoil, or fill-fissures penetrating deep into the limestone. Being effectively insoluble in the present climate, they are working downwards as the limestone surface is lowered by dissolution. Where the fissures connect with the caves, the lumps have slumped down to form debris-cones on the cave floor. Cones of this type are present in several caves, containing not only limonite and ochre, but normal stony soil as well, which followed the iron ores down the hole.

The limonites are always accompanied by yellow ochre (soft amorphous $Fe_2O_3.H_2O$, brilliant yellow in colour) which appears to be partly primary, formed by direct oxidation of pyrite, and partly secondary, formed by weathering of limonite. The miners removed the ochre and ochreous earth, leaving the limonite in heaps on the cave floor.

In the highest cave, stalactitic limonite and ochre appear to have encrusted the cave roof in the gap above a nearly complete sediment fill. Chunks and crusts of the minerals peeled of; creating a very ferruginous breccoid top layer to the sediments.

Interpretation

The largest cave group, consisting of two large galleries, was never filled to the roof with sediment. Most of the floor deposits, up to 4 m thick, have been removed, although some remain exposed. They consist of an unsorted breccia of various, relatively insoluble materials ranging from limonite and yellow ochre to grey clay, sand and marl. The top surface of the floor deposits was virtually level. In this case, the deposits appear to consist of insoluble material that accumulated while the caves were being developed by slow-moving phreatic water, probably in middle or later Pleistocene times.

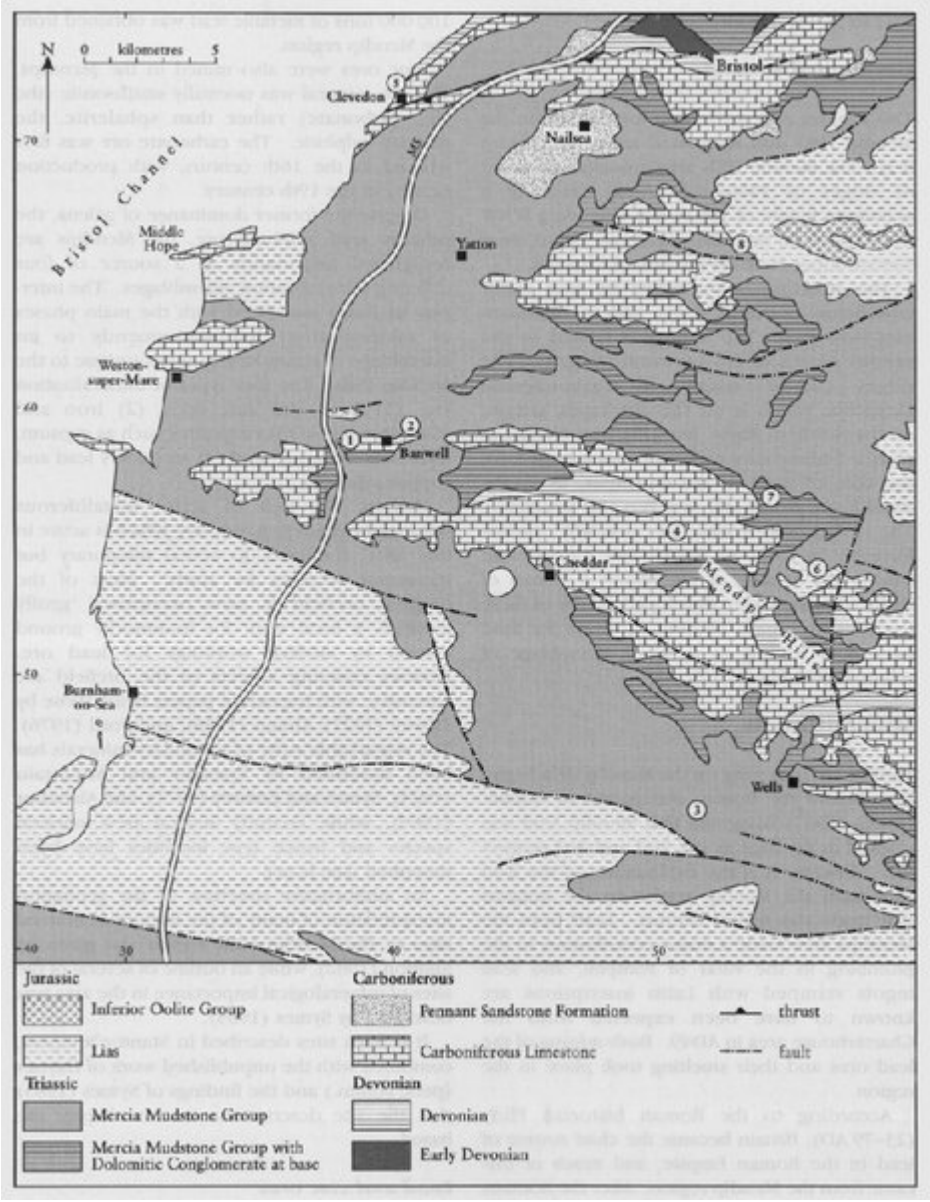
There is evidence, therefore, of at least two phases of limonite and ochre accumulation in the caves; one beneath the water-table as the passages were forming, and a second much later in the form of subaerial stalactitic and mass-flow

deposits invading the caves. The original source of the iron in both cases would have been oxidizing pyrite masses above the water-table.

Conclusions

The five caves found at the Banwell Ochre Caves GCR site contain the most extensive accessible yellow ochre workings in the Mendip Hills area. A wide variety of ochre types and iron hydroxides (limonites) can be examined *in situ,* and the evidence of their accumulation as residual ore-bodies associated with Pleistocene sediments is demonstrable.

References



(Figure 6.1) Map showing the locations of the GCR sites in the Mendips: 1 — Banwell Caves; 2 — Banwell Ochre Caves; 3 — Ben Knowle; 4 — Charterhouse Lead Orefield; 5 — Clevedon Shore; 6 — Wurt Pit; 7 — Compton Martin Ochre Mine; 8 — Hartcliff Rocks Quarry.