Banwell Caves, Avon

[ST 383 588]

Introduction

Banwell Caves are situated 5 km east of Weston-super-Mare, at the western end of the Banwell Hill limestone ridge (see (Figure 6.1)). Two sets of caves in limestones of Carboniferous age are mineralogically important, namely Banwell Bone Caves and Banwell Stalactite Cavern.

The principal mineral interest, namely barite mineralization, is well exposed as encrustations in the roof and on the walls and as vein fillings in association with minor amounts of galena, smithsonite, limonite and 'yellow ochre', and can also be closely studied from several loose blocks on the cave floor.

The site is also of particular importance for its uniquely rich Pleistocene bone assemblage (comprising mainly bison and reindeer), as well as for the fact there is evidence that the site appears to have been a pitfall trap.

Description

The palaeontological importance of the Banwell Caves has long been appreciated and is mainly focused upon the large and varied collection of bones related to the Pleistocene mammalian fauna found in the infilling sands of the caves. Miners following barite-galena-smithsonite mineralization in the Banwell Stalactite Cavern originally discovered them.

There is no literature on the mineralized features of the caves, and the following description represents unpublished research by W.I. Stanton (pers. comm.). Barite commonly occurs as white micro-crystalline chalk-like encrustations several centimetres thick, coating the walls of the caves in the limestones. Some cavities are roughly spherical, like large vugs. In one, the barite covers a floor deposit of grey, silty, horizontally laminated sediment that has been lithified by calcite impregnation. Other cavities follow bedding planes, and the barite in these varies from thin flat lodes parallel to the bedding, to thicker lodes in which the mineral occurs in association with sandy sediment that shows cross-bedding in places.

In a maze of very narrow mine-workings beneath the entrance to the Banwell Stalactite Cavern, barite forms impure vein-fillings up to 0.6 m thick, dipping at about 40° (see (Figure 6.4)). The mineral here is soft and earthy, and contains streaks and breccias of grey silty or clayey sediment that was apparently being deposited at the same time. There are small 'eyes' of galena in the barite, pinkish-brown films of smithsonite ('calamine'),'' and some limonite and yellow ochre.

The barite-coated vugs and lodes in parts of the Stalactite Cavern guided later phreatic cave development, which has enlarged them in some places and bypassed them in others. In enlarged cavities, fragments of an insoluble mineral crust have previously fallen to the floor and formed residual barite-rich cave earths. At one point, about 2 m into the Stalactite Cavern, there is a thin vertical vein of plastic blue-grey clay, possibly a Rhaetian or Jurassic neptunian dyke, and related to the grey sediment that accompanies the barite in some of the deposits.

Interpretation

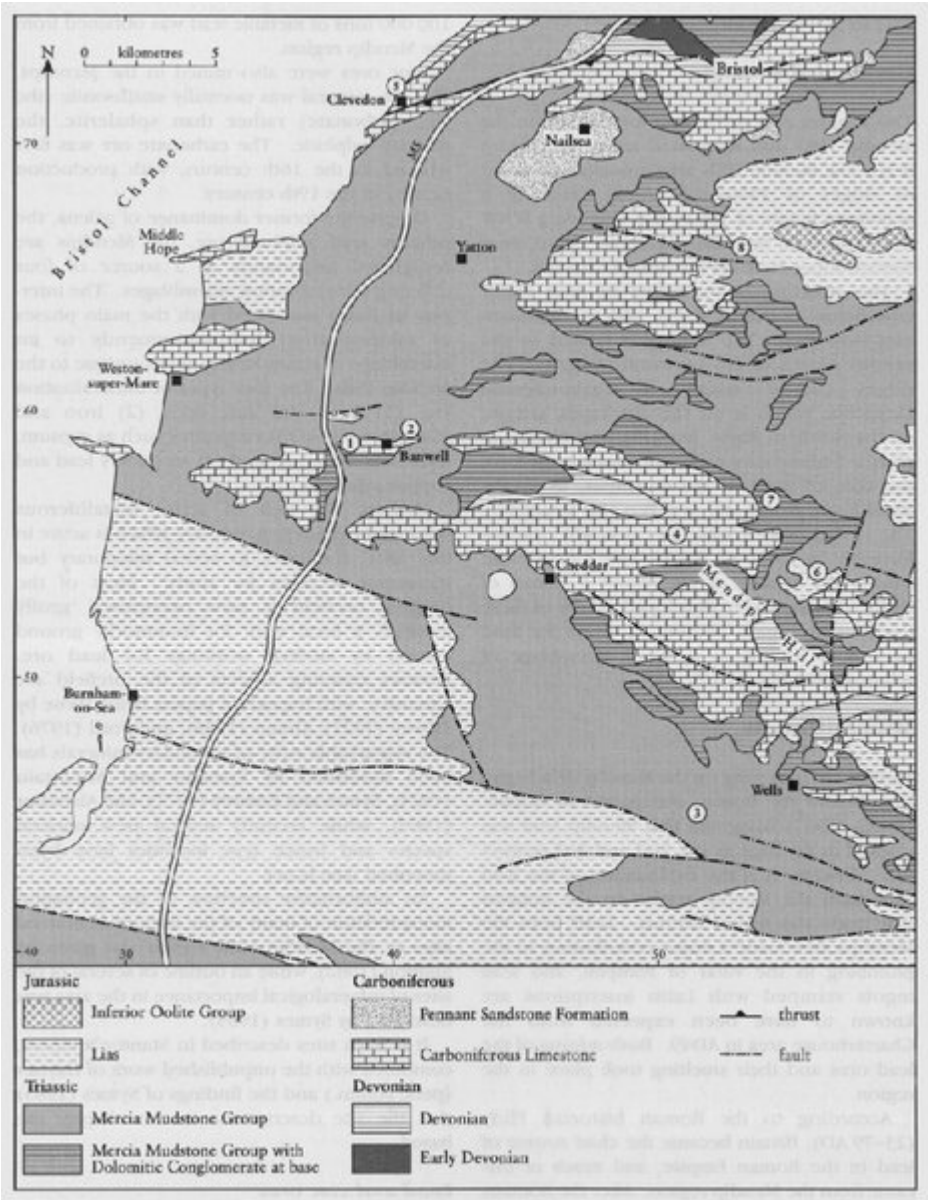
Green (1958) described the ancient lead-zinc orefield of the central Mendips in detail. The deposits worked contained galena, sphalerite and pyrite associated with the gangue minerals calcite, barite and rarely fluorite. Smithsonite was the main ore of zinc, although in the Mendips this is thought to be of secondary origin, being derived from the oxidation of primary sphalerite by the action of groundwaters. Barite occurs sporadically throughout the Mendips as a gangue mineral. Such occurrences are assumed to be products of the same mineralization of Mississippi Valley-type (Ixer and Vaughan, 1993), and occur in close time and space relationship with the sulphides, although the barite may also occur as late-stage vein infill associated with, or cutting, neptunian dykes.

There is some evidence from this locality that mineralization and associated sedimentation may be contemporaneous, and of a Jurassic age rather similar to other recorded Jurassic-age mineralization throughout the Mendips. Some comparisons can be made with the recent discovery and studies on layered Pb-Zn-Ba/Sr mineralization found in former cave environments in the Carboniferous Limestone of the Chipping Sodbury quarries (Rankin, pers. comm.).

Conclusions

The Banwell Caves provide readily accessible exposures of barite mineralization of the Mendip Orefield. The predominant barite mineralization found in the Banwell Caves has features characteristic of the main phase of the Mendips Pb-Zn-Ba mineralization, but the barite at this site is in greater abundance and variety than at any other location in the Mendip Hills. Associated clays and silts appear to have been deposited at the same time as the mineralization.

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.

(Figure 6.4) A vein of mineralization in the roof of Banwell Bone Cave. (Photo: Natural England.)