

## EXCURSION

### Brassington sand pits

18 July 2015 and 23 July 2016.

Leaders: Jim Riding and Peter Jones

Repeated by popular demand, the two excursions visited the same two quarries that had once worked Miocene sediments from within large solution hollows in the dolomitised Carboniferous limestone west of Matlock. Some 60 of these karstic depressions are now recorded, many of which were quarried for making refractory bricks. The suitability of the white sands lay in the coating of kaolinite on each quartz grain, which provided the clay content necessary to fire the bricks.

The Brassington Formation is divided into a lower Kirkham Member, a middle Bees Nest Member and an upper Kenslow Member. Fossil pollen in the two higher members has confirmed their Late Miocene age. They are considered to be material re-worked from a retreating cover of Triassic sandstone. There is debate over the age of the Kirkham Member; a Triassic age has been considered possible, but unlikely in view of the complete lack of sediment between it and the known Miocene beds.

#### Bees Nest Pit [SK241545]

Around 150 m across, this pit had been excavated to its limestone floor at a depth of about 35 m, but now contains a shallow pond below its largely degraded slopes. Patchy exposures in the upper slopes were examined. Blocks of Sherwood Sandstone and Bowland Shale were found, along with degraded chert from the limestone. Banded clays yielded plentiful fossil wood.

There was discussion about the nature and mechanisms of the karstic depressions to allow preservation of the Miocene cover while all sediment was removed from the surrounding limestone plateau. The synclinal sag of the sediments, with very steep and irregular dips observed in places, confirms that the sediments were not from primary deposition within cenotes in a karst terrain. Debate continues over the nature and timing of collapse and subsidence that saw parts of the Miocene sediments lowered into the karstic hollows from a once-continuous sheet. The old concept of large-



*Society members in Kenslow Top Pit in 2015.*

scale cavern collapse is no longer tenable. More gentle subsidence is indicated by the limited deformation of the sediments, which do not form a totally chaotic, undermined, collapsed mass. This may have depended in part on suffosional removal of the sand to which the dolomitised limestone degrades, as opposed to block collapse that would be more typical in a strong limestone.

#### Kenslow Top Pit [SK182615]

Quarrying had coalesced three adjacent pits to create a depression nearly 300 m across. This was worked to depths of around 40 m, though the sands continue to about 75 m deep. The pits were on the line of a fault line that probably aided local dissolution of the limestone and dolomite. This may relate to a small working, purportedly for barite, in limestone on the eastern rim.

The southern end of the pit exposes a thick sequence of brown, glacial sediment. These included a bedded sequence part of which appears to have been overturned by glacial drag; this raised a question about the generally held view that there was little ice over the Peak District and that which did occur was largely static.

The leaders knowledgeable guidance around both pits benefitted from the many photographs that they had with them, which came from Peter Walsh; he had been there when the quarries were working and the sediments had been clearly exposed prior to development of the thick plant cover.

*The full extent of the Bees Nest Pit in 2016*

