

REPORT

Titan Shaft, Peak Cavern

Peak Cavern is the finest of the cave systems beneath Derbyshire's White Peak, and more than 15 km of passages have been mapped in its complex series of streamways, shafts and chambers. It has yielded its secrets slowly, because explorations have been hindered by deep flooded loop passages and major collapsed boulder chokes. Weekend cavers continue to find new bits, and have now found the largest and deepest shaft in Britain.

The Titan Shaft was entered at its base when cavers dug their way up through a great pile of fallen limestone blocks on New Year's Day 1999. They had started in a choke at the side of the main stream passage nearly 2 km in from Peak Cavern's gaping entrance, and were nearly 30 m above water level when they came out into a chamber with its walls soaring into blackness. The only way up Titan was by climbing the walls - mostly by placing a line of rockbolts in the smooth water-polished limestone. This took many weekends of long trips underground, but six months after finding the floor of Titan, they reached its top, 145 m above its floor.

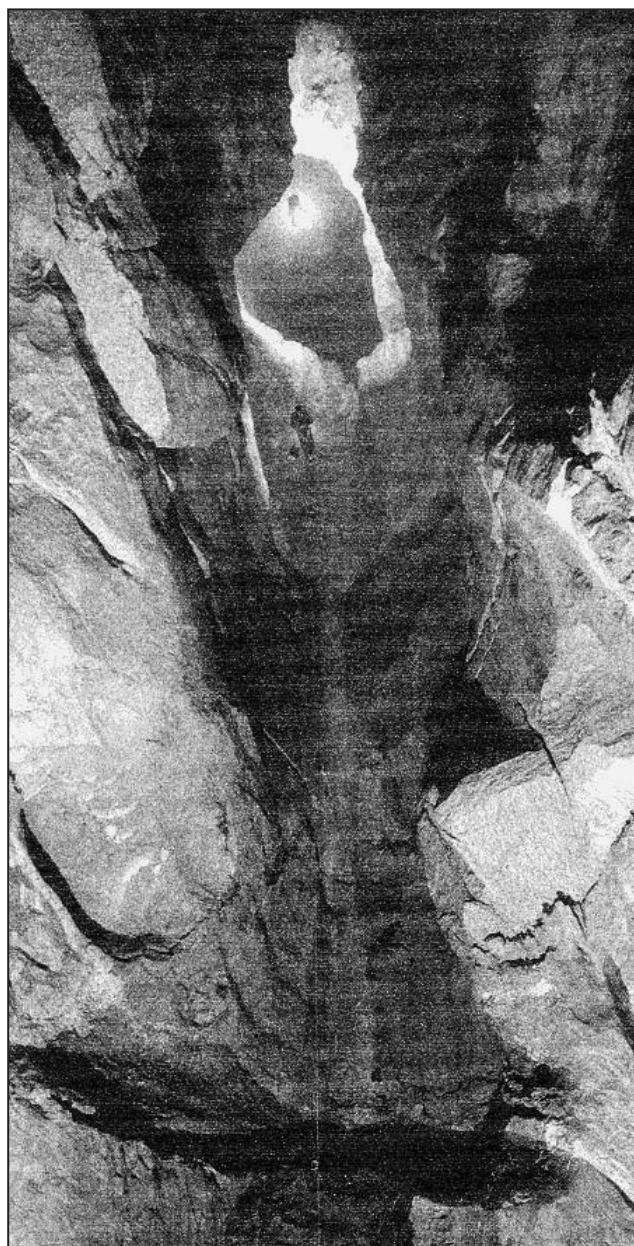
Titan is a truly massive shaft. Its lower half is about 10 by 20 m in plan; it narrows at some rock overhangs about 60 m up. The upper half of the shaft is a huge rift about 15 m wide and opening upwards to about 80 m long at its main bedding plane roof. A small stream enters from an inlet cave at mid-height, and becomes a narrow waterfall 60 m high, but Titan's upper rift is almost dry. Titan is by far the deepest shaft in Britain; Ingleborough's Gaping Gill is just 110 m deep.

Titan lies beneath the grass slopes of Hurd Low, between Rowter Farm and the top end of Cave Dale, where the land surface is almost exactly 200 m above the Peak Cavern stream passage. It has been formed on a narrow lead vein that lies almost east-west. Miners of the past had worked this to just a few metres depth. Perhaps it was fortunate that the vein was not rich enough to entice them deeper - where they could have broken into the top of Titan, with traumatic consequences.

It appears that Titan originated as one of the large vein cavities that characterise the Peak District karst. These were etched out by dissolution along the existing rock joints, and their origins appear to reach back to hydrothermal processes linked to deposition of the vein minerals. Subsequent dissolution was by karstic circulation of meteoric waters, far below the water table, and long before fluvial excavation of the Hope Valley had allowed drainage of the limestone. Water from the surface never entered directly into Titan; a large choked passage in the western end of the rift 120 m above the floor may be the remains of an important cave that fed drainage from the west into the shaft.

For much of the Pleistocene, drainage from Rushup Edge looped deep into the limestone before emerging from Peak Cavern into a Hope Valley whose floor was far above that of today. That original rising was a deep vauculian spring, which was drained when its outflow channel was cut down (to create the Peak Cavern gorge) in response to the valley floor lowering. Titan was progressively emptied as the water table fell, and the shaft continued to be enlarged and modified by waterfall dissolution and small-scale rock collapse. Ultimately, surface lowering will expose its top, permit greater erosion of its walls, and let more rock fall to its floor - until it looks more like Eldon Hole. But today, Titan remains in the dark, as a deeply hidden gem of the Peak District geology.

Tony Waltham



Cavers on a single rope give scale to the lower half of Titan shaft [Photo: Paul Deakin]