

# Tiankeng Tour

Tony Waltham describes the ultimate karst field trip to south-west China's massive tiankeng.

Once upon a time, a learned Chinese professor heard about a huge collapse sinkhole in a remote part of Sichuan. So he went to look at it, with some English caving friends, and found lots of big caves. A few years later he heard about another big sinkhole near the Yangtze Gorges, and his caving friends found more big caves.

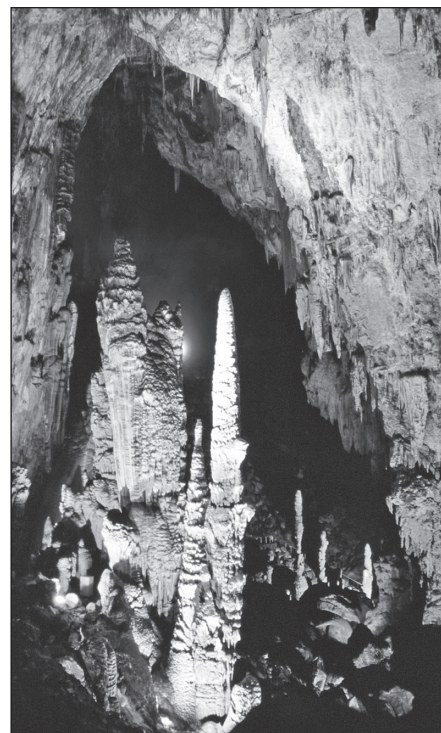
The professor was Zhu Xuewen, and he worked at the Institute of Karst Geology in Guilin, so he got really excited about these giant holes. His first find was at Xingwen in the early 1980s. Soon after that, the explosive development within China made communications and travel easier, and he found more and more giant sinkholes. He had not really discovered these giant sinkholes, because local villagers had been living there for years, but nobody outside the villages knew about them. So he and his Chinese friends wrote a book (in Chinese) about the big holes

absolutely magnificent. We spent ten days in some of the most fantastic and spectacular karst terrain in the world, we visited a handful of excellent showcaves, we walked through giant tunnels, we were entertained like kings with unbelievable kindness and hospitality, we had daily banquets – and we saw some huge tiankengs. This was probably the best karst field trip ever. Chen Weihai and Liu Zaihua joined Prof Zhu as perfect hosts, and we were feted by local government officials at every turn. Our group of very widely travelled karst specialists were seriously impressed.

We headed out of Chongqing city (in our own bus, along a brand new motorway) into the high karst in the eastern corner of Chongqing province. On the way into Wulong we picked up our police escort, with his flashing lights and complete disregard for all rules of the road – we were now VIPs and the way was cleared for us.

## Tianxing: Furong Dong

First stop, Furong Dong, just east of town. It had been found about 15 years ago, when locals dug through a draughting choke in a rock shelter – and broke straight into a splendid passage 40m high, 20m wide. Stuffed full with decorations, this has made a superb showcave. Flowstone has been dated to 160ka, and there is



Tall stalagmites in the main passage of Furong Dong. Photo: Tony Waltham.

## San Qiao

Instead, we retreated to San Qiao, just north of town. A gorge with vertical walls over 120m high (Cheddar Gorge eat your heart out), this is a huge collapse into a huge cave passage. A few bits of roof survive as soaring natural bridges – San Qiao means 'three bridges'; between them are two great tiankengs. This is a mega-collapse. The footpath through them all is magnificent. We were already impressed.

The evening banquet featured roast duck.

## Houping: Erwang Dong

Next morning our bus had been magically replaced by a dozen Toyota Land-cruisers. We were heading for the hills, sadly shrouded in rain. At the end of a quagmire, Prof Zhu set off across muddy fields. "Come" he said, through the rain. "Why?" we said, through the clouds. "Come" he said, almost lost from sight. We trekked after him, towards a line of trees. There, he and the attendant 37 villagers stood proudly beside a bamboo platform that reached between the trees and projected into space. The locals had built this specially for us, so that we could see the view down. Two at a time, we edged forward to peer into ... cloud. Total white-out. Apparently Qingkou Tiankeng dropped 300m below our feet. But we never saw it. Profuse thanks to slightly saddened villagers so proud of their tiankeng, and we were whisked away behind an ever-smiling Zhu.

After lunch, to Erwang Dong – a cave that led through to the foot of the tiankeng. We drove through the rain to another tiny village where a thousand firecrackers heralded our arrival in front of a reception committee of nearly 70 villagers (the entire population). Escaping from the traffic jam



– and called them tiankengs – a word already in local use, roughly meaning "sky hole".

But Professor Zhu is now of mature years and was already close to retirement, so he decided that his big project was to make tiankengs known around the world. He wanted the word *tiankeng* to be as widely accepted as *doline* in the international literature, and then to apply the term to the 50 or so tiankengs that he had found in China, and perhaps to about 25 more giant sinkholes in various karst regions outside China. So he invited a dozen of his foreign karst friends to join him on a tour round the best tiankengs in China – to see what they thought. Afterwards they could go home and write about tiankengs, so that lots of people would know about them.

## Chasms of Chongqing

So everyone gathered in Chongqing in October 2005 to set off on Prof Zhu's Magical Mystery Tour. This proved to be



Left: One of the giant natural bridges at San Qiao, seen from the tiankeng floor. Above: Exit from Erwang Dong into Qingkou Tiankeng. Photos: Tony Waltham.

some splendid aragonite and helictites. Fortunately we did not continue beyond the show cave path to the 150m pitch first descended by Colin Boothroyd in 1994; sadly for Colin, it was blind.



in the mud, we walked through to the cave entrance tucked behind a house. We had our own lamps, but in the entrance chamber a county official handed out small torches. Erin Lynch had joined us for the day, and she led the way. It was 3km through to the tiankeng. Easy walking in grand tunnels was broken by the odd clamber over boulders.

But this was caving Chinese-style. There were 15 of us, plus a dozen villagers, plus a dozen county officials, plus a couple of TV video crews, plus about six of the drivers, plus numerous folks we had never seen before. About half the locals had lights, and none had a helmet. Some of the officials were in office suits, some of the girls seemed to have their party gear on, and our escorts from the police car were in their uniforms (but were without their flashing lights, or indeed any other lights). To the Chinese, a cave is just another place to walk in. But we were well looked after. An open shaft just beside the route was no danger, because a villager was stood there to point our way around it. Then a bit of a tricky climb – but equipped for the day with a bamboo ladder built in situ by the villagers. Officials in suits, dolly birds and policemen queued to descend in almost total darkness.

Erwang Dong is just a small part of the extensive Houping cave system still being explored by the Hong Meigui cavers. Its old and abandoned passages have some excellent phreatic features, a few flowstone remnants, scattered nitrate diggings and some long dusty floors of silt-sized calcite produced by weathering of the cave ceiling. Eventually we joined a wide stream passage and emerged into daylight in a forest of greenery surrounded by vertical limestone walls with small waterfalls dropping 200m or more. This was the floor of Qingkou Tiankeng – a dramatic spot reached by an unusually easy underground stroll.

Back through the cave, just lost a few times in branching phreatic tunnels. Three more villagers, carrying piles of wood, walk

past with just candles – where did they come from?

*The evening banquet featured ba bao cha – cups of delicious “eight treasures tea” in which floated small ornamental gardens.*

### Xinglong: The Great Crack

A day was taken by a long bus ride and a high-speed ferry down the Yangtze to Fengjie, then another bus to Xinglong. But the next day we went to Xiaozhai Tiankeng. Over 500m across and 662m deep, this is an incredible feature. The river cave that it drops into is still being pushed by the Brits on the China Caves Project, but the tiankeng itself is now an accessible tourist site. A stone path winds round the upper part of the tiankeng and zigzags down a debris cone to the floor of the inner shaft; it is an amazing construction with 2,800 steps made of limestone blocks. The cave river was in full flood, roaring through its moments of daylight between towering rift passages. The whole tiankeng represents a history of progressive collapse on a massive scale – it gives a whole new dimension to karst processes. In the afternoon we peered into Tianjingxia, the narrow karst gorge also known as the Great Crack (though it is a solutionally enlarged feature and is not just a crack). This is an amazing karst terrain, but we were soon on our way back to Fengjie.

*The evening banquet featured ducks’ tongues.*

### Glories of Guangxi

Next day we took the ferry and boat back to Chongqing, for a banquet featuring ice carvings of fish; then a morning flight to Nanning, for another long bus ride to Leye in the heart of the Guangxi–Guizhou karst.

### Leye: Chuan Dong & Dashiwei Tiankeng

A new day started with a visit to the local museum that features the many tiankengs in the Leye karst – now the key features of a geopark. The museum is excellent, with displays designed by the Institute of Karst Geology in Guilin,

### Tiankeng Defined

- 1 It is a distinctive type of very large collapse doline.
- 2 It is more than 100 m wide and deep, with a depth/width ratio close to unity.
- 3 It has vertical cliffs round most of its perimeter.
- 4 It was formed by collapse of a large cave chamber into a large cave river.
- 5 Surface lowering within a solution doline may have contributed to this collapse.
- 6 Tiankeng development is largely in the vadose zone within deeply dissected fengcong karst.
- 7 Some tiankengs are partly eroded by sinking allogenic streams.
- 8 Immature tiankengs bell out to floor areas that are larger than their surface openings.
- 9 Degraded tiankengs have most of their perimeter cliffs masked by rock debris.

so that it is commendably informative. Right behind it, the showcave of Luomei Lianhua Dong gave us a delightful walk through to the next valley. Its well-decorated passage is notable for the many circular shelfstone formations up to 2m across that grew around stalagmite stumps in pools that are now dry (except when the cave acts as a flood overflow); these are known as lianhua (lotus) deposits in China, and as lily pads in the West.

At the exit our bus was waiting, to take us on new tourist roads through the spectacular, cave-rich cone karst of Leye. First stop was Chuan Dong, where remnants of the major Xiongjia trunk cave survive in hills on both sides of the road. We walked up to the northern segment, the shortest, which has a path through a spacious tunnel to an overlook in the wall of Chuandong Tiankeng. Again a few hundred metres wide and deep, this massive collapse feature has vertical walls around a forest-covered floor. Paths took us down and round, and into a huge side chamber with a tiny skylight far, far above. This was seriously lazy caving; but with underground sights like this to enjoy in comfort, we felt that the heavy-duty stuff could well be left to roughie-toughies rather younger than us.

Another short bus ride. Past more huge cave entrances and some lesser tiankengs. Then we were dropped off at the foot of a long flight of steps towards the top of a cone hill – a new tourist trail to a viewpoint above the giant Dashiwei Tiankeng. Over 400m across, this has collapsed outwards to create a perimeter of vertical walls cutting through three steep conical hills, with the high point 613m above the floor. It is truly amazing. Hidden behind boulders on its floor, a few kilometres of large river passage have been explored, largely by YRC members on the China Caves Project. But we felt that a long rope pitch to the tiankeng floor was best appreciated from above, and would merely impinge on one of the most spectacular days of spectacular karst that any of us had experienced. Leye



Andy Eavis at the lip of Xiaozhai Tiankeng. Photo: Tony Waltham.



is unforgettable.

*The evening banquet featured stir-fried bees.*

### Leye: Huangjing Tiankeng

A second trip into the Leye karst took us to Huangjing Tiankeng. This is a beautiful sight with a perfect ring of vertical cliffs. Perimeter footpaths through the forest lead to splendid overlooks, and platforms fitted out for tourist abseiling (a good 200m to the floor). Tourist prusiking is only an optional extra, because a short mined tunnel from the tiankeng floor breaks into a

short, but the lake scenery is great, and you can have dinner served on your raft – karst for sophisticates perhaps. Though that impression hardly held true when we were joined by Ged Champion and his YRC team on a break from exploring the back end of Mawang to create a new Fengshan Geopark.

After lunch we dove up a new mountain road to Yuanyang Dong, yet another new tourist cave. A hillside entrance between massive stalagmites leads into what is effectively one giant

sloping chamber over 250m long, containing forests of stalagmites each 20 or 30m tall. As yet rather underlit, not widely known and little visited, this cave is virtually on the scale of Carlsbad. The karst of China never fails to surprise. We became almost blasé about the stunning karst scenery on our journey eastwards, that extended late into darkness at the end of another amazing day.

*The evening banquet included fried pigs' ears.*



Above: Dashiwei Tiankeng. Right: Calcite lotus in Luomei Lianhua Dong. Photos: Tony Waltham.

huge inclined passage that descends from daylight; a footpath winds up through the stalagmites in a show cave just incidental to the China scene but far grander than anything in Britain. We then left for an overnight in Baise.

*The evening banquet included whole crabs (try those with chopsticks) and sautéed silkworms.*

Suddenly we were done with tiankengs, but our favourite professor suggested the scenic route back to Guilin. In good weather we would never have made it – the hysteria for photo stops would have delayed us forever. But the murky weather of the day meant that we just sat in the bus mesmerised by hours and hours of the world's most splendid fengcong (cone karst) landscapes. Between us, and over the years, we had seen splendid karst all round the world, and also in a fair slice of China, but this exceeded all previous experiences.

### Fengshan

We stopped off near Fengshan for a relaxing raft ride through Sanmeihai Dong (Three Doors Seas Cave). This is a new tourist site created by easing boat access through the doline lakes connected by caves at the exit from Mawang Dong (a major trunk cave mapped by the China Caves Project back in 1989). The caves are

### Guilin: Guanyan Dong

Back at the Institute of Karst Geology in Guilin we had a day of indoor meetings and discussions (more enjoyable than they sound), and also took off for a day trip around the fenglin (tower karst) of Yangshuo – just to remind us that China's karst has the lot. The final banquet had everything imaginable, in addition to many items unimaginable. It was a climax to an incredible tour of banquets and tiankengs.

After most folks had flown home, a few of us went to take a look at Guanyan, a newly developed show cave in the major tourism zone south of Guilin. This is part of the cave system that was the first to be mapped in China, during the 1985 China Caves Project. But how it has changed! The road stopped us just short of Caoping village, and beyond the ticket office we were directed to sit in two-man, electric go-karts-on-rails; press the handle to go. We shot off along a raised track across the paddy fields. Beautiful, with karst towers to left and right.



Go-kart to Guanyan Dong – beats walking. Photo: Tony Waltham.

The track carried us straight into a tunnel and ended in front of a few yards walk into the natural cave. Old phreatic chambers; follow the path through – and there's a train waiting. The railway took us along the main high-level tunnel with phreatic fretwork embellishing the roof. Last time I had been here was on the original survey with Dick Willis, when we met Tony White and Tim Fogg coming in from the other end. Tony and Tim had told us about a big chamber – but this time we went by train. And now the chamber is lit in Chinese style with technicolour stalagmites rising into what had been darkness. It creates a feeling of being on LSD, but it is very impressive.

Down through the big chamber, to a boat dock and a cruise back along the clean-washed river passage. Then a short walk above more streamway, to a lift, up the main aven and out of the top of the hill. From there, free-wheeling go-karts down a concrete bob-sled track back to the Li River, and the way home. The Swinsto through-trip was never like this. More Disney entertainment than a karst experience; but a family day-out at Guanyan could offer a great kids' intro to caves.

Memorable, but not as memorable as Prof Zhu's tiankengs. Thank you Professor 'Tiankeng', this was a great trip. ■

### Further Reading

Cave and Karst Science **32**(2), 2006.

*The Yangtze Gorges Expedition 1994.* Cave and Karst Science **22**(2), 1995.

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The team. From the left, back row: Leye guide, Andrej Kranjc, Lilian Eavis, Zhu Xuewen, Andy Eavis, two Leye guides, Julia James, Will White, Jan and Tony Waltham; front row: Chen Weihai, Alexander Klimchouk, Marija Kranjc, Beth White, John Gunn, Art and Peggy Palmer, Leye guide.