Hong Meigui
Sanba County 2007

Cave expedition to Yunnan Province, China

13th July to 18th August 2007

Final Report

Report prepared by members of the Hong Meigui Sanba County 2007 Expedition. Edited by Gavin Lowe.

1 Summary

The Expedition base at the Milk River Guest House

The 2007 Hong Meigui Expedition to Sanba County, Yunnan Province, China, was held between 13th July and 18th August. The aim was to explore a compact group of mountains, perched above the Jinsha Jiang (Yangtze River), and rising to an altitude of 4706m. The mountains seemed to have a lot going for them speleologically: solid beds of limestone, no surface streams, and a depth potential of over 3000m.

The first members —Pip, Chris, Gavin and Pete— arrived in Kunming on the 14th and 15th July, collected large amounts of gear from our Field Agent, Liu Hong, and caught the overnight bus to Zhongdian, the Expedition's base. They then spent a day acclimatising and shopping for gear and food.

Approaching Camp One, with the main Expedition area in the background.

The next day, they caught a local bus to the small village of Ji Ding. Two hours' walking later, they arrived at the site of Camp One: a valley used for summer-grazing, at the foot of the mountains. They tried to

recce a route up onto the top of the mountains, but the path chosen petered out.

The next day, the 18th, Pete was suffering from a respiratory infection, so he was left guarding camp, and the others made another attempt to find a route onto the tops. After some hours spent bush-whacking through trees, they broke out onto a better path. Eventually they arrived above the tree-line, into a glaciated valley, the planned site for Top Camp. There was still time for a recce of the area. One particular concern was water: a source of either water or snow for melting was needed. Pip and Chris explored the Top Camp valley, subsequently named Area A, up to the start of the next valley south, Area B, and then up to a hanging valley to the east, Area C (see Figure 1). Initial impressions were not promising: the area was rather shattered, suggesting caves would be blocked, although Area C appeared more promising; no sources of water better than a few drips were found. Meanwhile, Gavin headed north east, over a pass, into a valley to the north of the main peak of Bai Lian Guo, Area E. This area was covered with glacial debris, and so seemed even less promising, although, there did appear to be some cave entrances in the side of Bai Lian Guo. Further, no source of water was found: there had been hopes of finding snow in the shadow of the mountain. The group re-united and headed down the hill, following an alternative, but less pleasant, route.

Resting on the ascent to Top Camp.

The next day Pete was still ill, so he and Pip returned to Zhongdian. Chris and Gavin carried gear up the hill, and established Top Camp. A ground sheet and bin bag were laid out in hollows on the ground to catch rain water. Gavin returned to

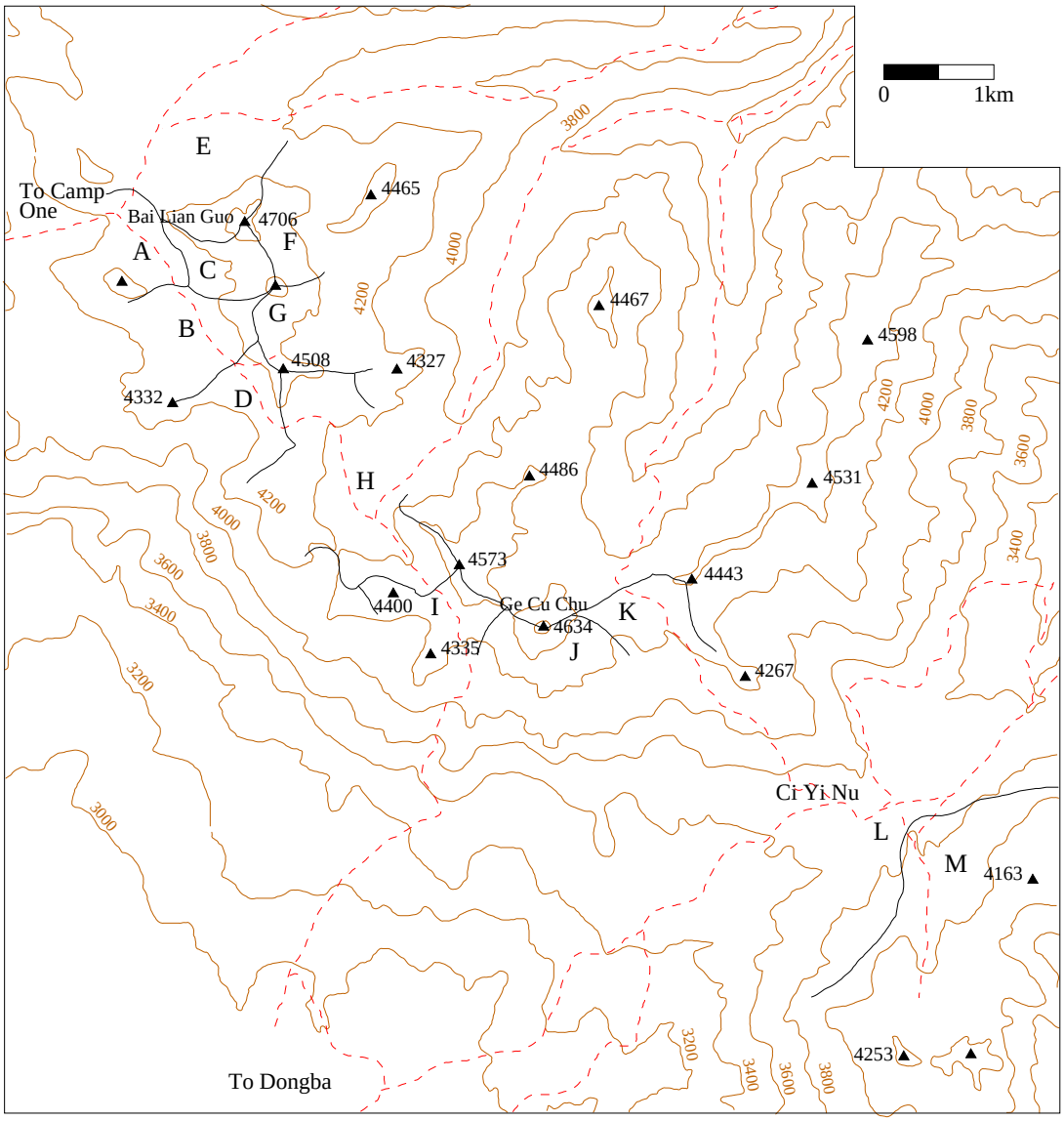


Figure 1: Map of Expedition Area

The Top Camp tents, with the kitchen shelter behind

Area E, and then followed a dry valley to the north hoping to find a stream, as the rain started. After about a kilometre, there was no sign of a stream, and the rain had got heavier, so he returned, only to find that the rain had caused a stream to start running at the top of the valley. Meanwhile, Chris followed the Area E valley to the east, again hoping to find a stream, but with no success.

The rain got heavier overnight, and the pair awoke to find the tent floating in a pool! They quickly moved to higher ground. The rain continued all the next day, preventing any useful work. Elsewhere in China, this rain had caused the worst flooding in over 100 years. At least earlier worries about a lack of water had disappeared!

The weather was not much better the next day. Chris and Gavin walked down to Camp One, and met Pip there. The three carried more gear up the hill. The rain stopped briefly in the afternoon allowing some prospecting, in Areas A, B, C, and further south into Area D. In Area A a couple of small cliff caves were found, but the initial impressions of the area being poor were confirmed. Area B had a few more solid blocks of limestone, but no entrances were found. Area C appeared more promising: an area of diggable sinks and fossils sinks, and two small blocked caves were found. Area D, again, appeared very shattered.

The next day, the 22nd, the three went back to Zhongdian for more supplies, meeting Pete going in the other direction to Camp One. Pip and Chris returned to Top Camp the following day, while Gavin waited in Zhongdian for Beardy and Sam.

On the 24th, Pip, Chris and Pete continued to prospect the hills, as the rain continued. They explored Area C, and continued over the main ridge into Area F. This area seemed better: it included a shoulder of hillside, with more solid rock, where they found a few entrances.

After a day of carrying more gear up from Camp One, in the rain, Pip and Chris explored some of the new entrances in Area F. Two quickly choked, but one entrance, F1, descended an unpleasantly narrow rift for 30m, until they

Beardy under the kitchen shelter

ran out of rope. Meanwhile, Pete prospected in the next valley south, Area G, where he found two shafts. Area G again included a shoulder of hillside, so it was starting to become clear that such areas appeared the most promising. Beardy and Sam had arrived by this time: they walked up to Camp One, while Gavin continued up to Top Camp.

Overnight it turned much colder: the team woke to find several centimetres of snow on the ground. The group returned to F1, where Gavin continued from the previous limit, until eventually hitting a complete choke about 60m down. They then continued to one of the caves Pete had found the day before, G2: a pitch dropped 20m, but all ways on at the bottom choked.

The following day, Sam and Gavin tried to get to the possible caves that Gavin had seen on Bai Lian Guo earlier in the expedition. They slogged up steep unstable scree slopes, only to find that all were simply solutional features. They continued round the mountain, but found nothing. Meanwhile, Pip, Chris and Beardy went prospecting in Areas F and G. They found one cave, G3, which they pushed to a depth of 35m before it choked.

Descending the scree slope of Bai Lian Guo

The next day, the 29th, Pip, Chris and Pete headed back to Zhongdian: Chris to head home, and the other two to buy more food. The others waited for the rain to stop. When it did, they decided to investigate the 4473m peak south of camp, although Sam soon turned back, feeling ill. A couple of possible entrances turned out to be the normal solutional features. Beardy and Gavin continued up to the ridge, over treacherous scree, before deciding the mountain was too

shattered. On returning to camp, they found no sign of Sam. An anxious hour followed, searching for him in the rain —looking at the base of cliffs in case he'd managed to fall off one— before he calmly strolled back into camp, having taken a detour into Area C!

The following day, Sam and Beardy prospected in Areas B and G, but found nothing. Meanwhile, Gavin prospected further south, crossing the col to the south east of Area D —after a minor epic in the scree slope— into Area H, a good-looking area, partly wooded, with a shakeholes, and surrounded by solid, but near-vertical, cliffs. He then continued to the south east over the next col, into Area I; this area again looked very good, and he found three small entrances.

Beardy and Pete returned to Areas H and I the next day. They explored one of the caves Gavin had found, but the other two were pouring with water from the rain; they also found a fourth cave in Area I. Meanwhile, Pip arrived from Zhongdian, and Sam and Gavin headed down: Gavin had strained his back, so he was forced to spend several days recuperating.

Descending into Area H

The first of August saw a complete change in the weather, with bright clear weather replacing the previous rain and clag. This led to much more efficient prospecting. Over the next few days, the team prospected in Area E, finding nothing, and in Areas H and I, confirming that the area looked good, but finding only a couple of small caves. Beardy fell ill with bad cold-like symptoms, and returned to Zhongdian to recover.

Sam and Pip prospected further on from Area I. They traversed round the southern flank of the mountain Ge Cu Chu, an area of scree-filled valleys — Area J— useless for caves. Crossing a ridge, they came into a bowl, Area K, containing a large stream sink and several smaller fossil sinks: this area again looked promising, but all the leads are long-term digs.

More prospecting followed in the following couple of days, but it was becoming increasingly obvious that, while the mountains looked excellent in many ways, there just weren't any going caves. A decision was therefore made to break camp and return to Zhongdian.

After their rigours on the mountain, Pip and Sam wanted a break and so, together with Beardy, who was now recovering, they spent a few days walking in Tiger Leaping Gorge to the south, Beardy returning home afterwards.

Meanwhile, Pete and Gavin caught a bus to the village of Dongba, to the south of the main mountain block. They spent two half-days, reconnoitering

the southern flank, so see the mountains from a different angle, and to try to understand the hydrology. The mountains again looked very good from this angle, with solid limestone rising over two kilometres above Dong Ba, although the best looking rock was inaccessibly steep. Several streams ran off the hillside, but these were surface drainage rather than being fed by any underground drainage.

During the following days, Pip, who had nearly come to the end of her time in China, and Gavin, who had strained his back again, visited the town of Lijiang, to the south.

Meanwhile, Pete and Sam tried to walk to the Jinsha Jiang gorge, to look for resurgences. They caught a bus to the village of Luoji, in a valley to the north of the main mountain block. From here they ascended 1000m, in heavy rain, to cross a col. They descended slightly, and camped in view of the Jinsha Jiang, but still 1100m above it. They could see the river emerging from a gorge, with vertical cliffs, 800–1000m high, dropping directly into the water. It was clear that they would not be able to follow the river to look for resurgences, and so decided to return. However, their conclusion was that the mountain was solid limestone, and the underground drainage probably did run in that direction.

On returning from Lijiang, Gavin carried out a brief recce to a sub-block of the mountains, to the south-east of the main block. He caught the bus back to Dongba, and then ascended 1400m to a col between the main block and the sub-block, where he camped. The next day be prospected on the mountain to the east of the col, from where near-sheer cliffs descended to the Jinsha Jiang. Again the mountains looked good, but he found only a couple of small caves. He continued towards the mountain to the south, but the terrain here was heavily wooded, making prospecting difficult and unproductive. He returned to the col and spent some time checking out a few possible entrances, all of which were just solutional features. With time running out, he broke camp, and returned to Dongba.

The end of Expedition had arrived. Equipment was posted back to the Hong Meigui gear store, and the final three Expedition members caught a bus back to Kunming, and from there flew home.

The results of the Expedition were undoubtedly disappointing: all the team worked very hard, under difficult conditions, but have little to show in terms of cave passage found. Our impression is that the mountains have been raised too quickly, and so there hasn't been enough time for decent caves to develop. A few leads remain: some long-term digs of stream sinks, and some holes visible high in cliffs; but these leads are not promising. This area of Yunnan Province has the potential for some very deep caves, and it's clear that there is a lot of underground drainage; but it's not clear that a way in is ever going to be found.

2 Expedition members

SA	Sam Allshorn	Treasurer
PC	Pip Crosby	
PH	Pete Hartley	
GL	Gavin Lowe	Expedition Leader
CR	Chris Rogers	Medical Officer
PS	Paul Swire (Beardy)	Tackle Officer

3 Acknowledgements

We would like to thank the Mount Everest Foundation and the Ghar Parau Foundation for financial support, and Lyon Equipment for equipment sponsorship.

We would also like to thank the following individuals: our Field Agent, Liu Hong, for help with logistics over many years; our Home Agents, Tony Seddon, Ursula Collie, and Hilary Greaves; Erin Lynch and Duncan Collis for help with borrowing gear from the Hong Meigui gearstore; and Yifan Huang for help with translating.

A view in Area K, showing the shattered limestone typical of much of the Expedition area.

4 Expedition diary

13–14/7	PC, GL, CR	London to Kunming.
14–15/7	PH	Utah to Kunming.
15/7	PC, PH, GL, CR	Meet with Liu Hong to collect gear; catch night bus to Zhongdian.
16/7	PC, PH, GL, CR	Arrive in Zhongdian; buy gear and food.
17/7	PC, PH, GL, CR	Catch bus to Ji Ding; establish Camp 1 in valley at foot of mountain; unsuccessful attempt to find route onto mountains.
18/7	PC, GL, CR	Find route onto mountains; recce in Areas A, C, and E.
19/7	GL, CR	Establish Top Camp; recce in Area E; camp flooded.
20/7		Rain stopped play.
21/7	PC, GL, CR	Recce in Areas A, B, C and D; find and explore caves A1, A2, C1–C3.
22–23/7	SA, PS	Manchester to Kunming.
24/7	PC, PH, CR	Recce in Areas C and F; find caves F1–F4.
24–25/7	SA, PS	Night bus Kunming to Zhongdian.
26/7	PH	Recce in Areas F and G; find G1 and G2.
26/7	PC, CR	Recce in Areas F, C and A; find and explore F1, F2, F4, F5, and C4; find A3 and F3.
27/7	PC, PH, GL, CR	Explore F1, G1, and G2.
28/7	SA, GL	Recce in Area E; ascend steep scree slope to investigate possible entrances: all turn out to be false; recce in Areas F and C.
28/7	PC, CR, PS	Recce in Areas F and G; find and explore G3.
29/7	GL, PS	Recce on 4473m peak to SW of camp.
29/7	SA	Recce in Area C.
30/7	GL	Recce in Areas H and I; find I1, I2, and I3.
30/7	SA, PS	Recce in Areas B and G; find no caves.
31/7	PH, PS	Recce in Areas H and I; find I4; explore I1.
1/8	PH	Walked up 4706m peak Bai Lian Guo. Recce in Area E.

1/8	PC, PS	Recce in Area E.
2/8	PC, PH	Recce in Areas H and I; find H1 and H3.
3/8	SA, PC	Recce in Areas J and K; find and explore K1 and K2.
4/8	SA, PC	Recce in Area G; find and explore G4.
4/8	PH	Recce in Areas H and I.
5/8	PC, PH	Recce in Area H; find and explore H2.
6/8	SA, PC, PH, GL	Break camp and carry gear to Zhongdian.
8/8	PH, GL	Catch bus to Dongba; recce side of mountain above Dongba.
9/8	PH, GL	Return to Zhongdian.
11/8	SA, PH	Catch bus to Luoji.
12/8	SA, PH	Try to find route to Yangtze; reach col at 2600m looking down into gorge.
13/8	SA, PH	Decide decent to Yangtze was pointless, and return to Luoji.
14/8	GL	Bus to Dongba; walk to col containing hamlet of Ci Yi Nu, to SE of main block of mountain; establish camp.
15/8	GL	Recce area between 4163m and 4252m peaks to SE of Ci Yi Nu, and around Ci Yi Nu itself; break camp and return to Dongba.
16/8	GL	Bus to Zhongdian.
17/8	SA, PH, GL	Bus to Kunming.
18/8	SA, PH, GL	Flights to Manchester, Utah, and London.

5 Areas explored and caves found

All grid references UTM WGS 84 in grid square 47R.

Area A

Area A is the valley containing Top Camp at grid reference 105 615. It is reached from the village of Ji Ding by a walk of about five hours, passing the site of Camp 1 after about two hours.

Area A

The bottom of the valley is rather shattered and contains no known caves. The cliffs to the east of the southern end of the valley contain a few small caves. The peak to the west (4473m) is mostly very shattered; the south east end is slightly less shattered, but contains no known caves.

⊗ A1

Location: 40m above the valley bottom, on the eastern side, a hole in the cliff. GPS 0610791 3060112, ±10m, alt. 4286m.

Description: Closes down after about 3m.

⊗ A2

Location: Further up-valley from A1. GPS 0611016 3059747, ±40m.

Description: A goat shelter, which closes down after about 5m.

◯ A3

Location: On the walk up to camp, there is an obvious hole in the left hand cliffs above a black fissure. The obvious hole is choked, but there is a small black hole above the climb up, which could extend into a passage.

Description: Not explored, due to the difficulty of the climb up. Doesn't appear very promising.

Area B

Area B is the valley to the south of Area A. The top of the valley is covered with scree. The middle of the valley looks best, containing a fair amount of exposed, solid limestone. The lower part of the valley looks more shattered. No caves were discovered. The area is split by a subsidiary ridge.

Area C

Area C is the perched bowl above Areas A and B. The area contains several choked stream sinks and fossil stream sinks, which might be worth digging. There is also a fair amount of exposed limestone, containing a few entrances. The higher parts of the area are shattered and covered with scree.

Area C, looking down into the area of stream sinks.

○ C1

Location: An area of sinks and fossil sinks at the bottom of the valley. GPS 0611223 3059885, alt. 4402m.

Description: Several of the sinks could be worth digging.

⊗ C2

Location: In the valley south of C1. GPS 0611130 3059915, alt. 4380m.

Description: 3m deep hole into a boulder ruckle.

⊗ C3

Location: Near C2. GPS 0611159 3059926, alt. 4320m.

Description: The entrance was originally blocked with rocks, but was dug open to create a person-sized hole, with no way on.

⊗ C4

Location: In the cliffs on the right hand side above the path to the pass into Area F. One of the overhangs has an awkward rifting passage leading up into the cliff face. GPS 0611726 3059887.

Description: Soon chokes.

⊗ C5

Location: High up at top of scree slope. GPS 0611069 3059742 ±8m, alt. 4362m.
Description: Fine bedding cave, chokes about 4m in.

Area D

Area D is the valley to the south of Area B. The area is very shattered and contains no known caves. A path crosses the area to the col to the ESE into Area H. Another path ascends the scree to the col over the main ridge into Area G.

Area E

Area E is the area over the ridge to the NNE of Top Camp. This is a large shattered valley, sloping gently to the right where there is a dry stream bed. A major path crosses to the area to the NE, crossing the 4543m peak and continuing to the village beyond. Most of the area is covered with glacial debris. There are what look like entrances visible in the side of the main peak Bai Lian Guo; however, when these were investigated, they turned out to be just solutional features. The main valley runs east, passes some huts, and then descends steeply; a subsidiary valley joins near the huts, which appears to contain some entrances, but these were not checked.

Area E panorama

Area F

Area F is the area over the main ridge from Area C (and normally reached via that route) and to the east of Bai Lian Guo. The area contains some good-looking slabs of limestone, and a number of entrances.

⊗ F1

Location: Roughly in the middle of the bowl of the valley. GPS 0612163 3059971, alt. 4388m.. A 4m long by 1m wide rift.

Description: The shaft can be rigged off two naturals on either side of the rift, with a bolt rebelay at −20m, a spike deviation at −22m, and a spike rebelay at −28m. The top of the rift soon narrows to about 25cm width; care is needed

to find the widest part. The shaft lands on snow from where a crawl over rocks reaches a further 10m pitch in two sections, leading to a choke.

⊗ F2

Location: About 5m away from F1.
Description: 20m shaft ending in a snow plug.

◯ F3

Location: Another 5m away from F2.
Description: A 6m shaft which looks dead.

⊗ F4

Location: Overlooking the pass into Area F, on the left hand side going from camp. A large black overhang.
Description: A crawl leads off but soon chokes.

⊗ F5

Location: GPS 0612335 3059767, alt. 4343m.
Description: A 2m climb down chokes. A way to the side looks like it might go, but doesn't.

Area G

Area G is the area over the main ridge from Area D (and normally reached via that route) and to the NE of the 4508m peak. It is a glacial basin with many stream sinks and a couple of pits.

Looking down G2.

⊗ G1

Location: In the basin. GPS 0612310 3059320.
Description: 5m free-climb down. No way on.

⊗ G2

Location: Where the basin drops into the valley. GPS 0612181 3059296. A shaft, about 8m by 3m.
Description: The shaft can be rigged off a rock boss with a spike rebelay at −3m. The pitch lands on snow about 15m down. A crawl to the left chokes quickly. A crawl to the right was dug open, and leads into a small chamber with a descending slot; the slot was dug open, but it soon closes down.

⊗ G3

Location: In the mid to bottom level of the area, about 50m east of G2. Easily spotted from above.
Description: Short climb down over snow leads to head of pitch of about 35m. Pitch drops to rocky ledge then into boulder-filled chamber. Possible dig at bottom, but not very promising.

⊗ G4

Location: Near G2.
Description: A rift, choked after 3m.

Area G panorama

Area H

Area H is the area over the main ridge from Area D and to the SE of the 4508m peak. It forms the top section of the large valley that runs NNE, which splits the massif.

Area H is normally reached via an indistinct traverse of the scree slope in Area D, to the col south of the 4508m peak. Once over the col, the route drops into a bowl with some exposed limestone visible nearby. A path descends along a valley with a dry stream bed, and then leaves the stream bed to descend a steep muddy slope, before reaching a clearing composed of three bowls. At the

A view across Area H.

bottom, an indistinct path to the left descends the valley. The main path runs to the right, through woods, before emerging in the main clearing, which contains a few huts and two small stream sinks. At the eastern end, a path descends the main valley to the north, and ascends to Area I to the SE.

Much of the area looks very good, containing shakeholes and exposed limestone, but very few caves.

⊗ H1

Location: Climb over hill to east of col between D and H, and down cliffs to grassy col with shallow grassy depression. On north side of col and about 50m lower is obvious arch cave. GPS 0611969 3058277, alt. 4320m.

Description: 15m long cave, with spar crystals. No draft.

○ H2

Location: In the rock pillar at the western end of the area, an obvious arch cave. GPS 0611943 3057969, alt. 4310m.

Description: A 15m up climb (probably about hard severe standard) required to reach obvious ledge with rock arch. Not possible to see if it continues from ground level. Arch is about 4m diameter. Unexplored.

⊗ H3

Location: Higher and to the right of H1. The cave can be reached by climbing in from above.

Description: Chokes immediately after rock bridge.

Area I

Area I is the area around the col to the SE of Area H, between the three peaks of 4400m, 4573m and 4335m. The path from Area H continues to the south, and descends to Dongba. The area contains four small caves.

⊗ I1

Location: About 120m SSW of the col. GPS 0613100 3056995, alt. 4279m.

Description: A cleft, about 3m by 0.4m, descends about 4m to a choke.

◯ I2

Location: About 200m south of the col. GPS 0613187 3056924, alt. 4291m.

Description: A very narrow cleft, maybe too narrow. An obstruction at −3m needs removing. Undescended.

◯ I3

Location: Between the previous two entrances. GPS 0613156 3056972, alt. 4283m.

Description: A 5m undescended shaft.

◯ I4

Location: On scree above the area. GPS 0613219 3057174, alt. 4320m.

Description: Shaft (1m by 3m) in solid rock immediately below rock step. Appears to be partially blocked with small boulders about 4m down. Undescended.

Area J

Area J is the series of valleys to the south of the 4634m peak, Ge Cu Chu. All are very steep and filled with scree. No caves were found.

Area K

Area K is the bowl to the north of the 4634m peak. The area can be reached by traversing round the south of the peak from Area I, via Area J; alternatively, it might be better to approach the area from Dongba, to the south.

Area K panorama

⊘ K1

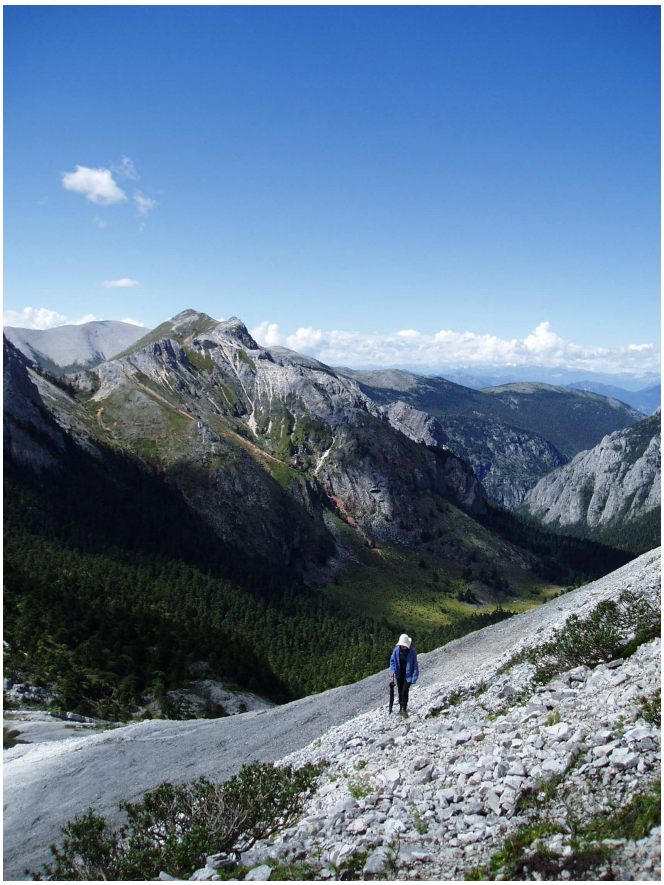
Location: Large sink hole in the basin.

Description: Choked. Possibly digable, but it would be a serious dig.

⊗ K2

Location: Slightly higher than K1.

Description: Choked fossil sink.



The long ascent out of Area K.

Area L

Area L is the area around the col containing the hamlet of Ci Yi Nu. It is reached from Dongba by a walk of approximately five hours. Paths continue to the NW towards Area K, to the NE towards the Yangtze, and to the SE towards Area M.

The cliffs around the clearing of the col contain many solution features, but no actual caves were found. From a point about 500m before the col, some prayer flags are visible on the hillside to the west; it is possible that these indicate caves.

Area M

Area M is the area to the SE of Ci Yi Nu. A path leads from Ci Yi Nu to a fork in a clearing after about 500m. The left path leads onto the peak of 4163m; the area around this peak contains some exposed limestone, but no caves were found. Alternatively, the right fork leads into the valley below the peak of 4252m; the peak itself is heavily wooded, and was not investigated due to lack of time. The area between the peaks contains a dense rhododendron forest, where navigation is difficult. To the SE of the ridge, cliffs drop towards the Yangtze valley.

○ M1

Location: From Ci Yi Nu, follow the path south, and then take the left branch in the clearing. The cave is visible in a small cliff, on a bearing of 174° from GPS 0617789 3054585, and on a bearing of 216° from 0618010 3054606.

Description: Unexplored.

⊗ M2

Location: Further up than M1, in the base of a cliff, 200m left of the path. GPS 0618130 3054662, alt. 3995m.

Description: 3m wide by 2m high entrance, with small built wall, leads into 5m by 3m chamber, with too-tight rifts to left and right.

6 Geological interpretation

The expedition area is the group of high (4300–4700m), glaciated limestone peaks running south east from the major peak Bai Lian Guo (4706m).

In this area the Triassic (T_2b^1, T_2b^2, T_2b^3) limestone is uniform and well bedded and dips to the north east at approximately 25°.

The underlying conformable Permian (P_2n) sandstones are exposed to the west (seen on the walk in) and in the Dong Ba valley which bounds the area to the south. Some highly weathered volcanic rocks are present in the Dong Ba valley and our Area D.

To the north the area is bounded by an east-west fault beyond which are the P_2n sandstones again as seen in the Luoji valley.

To the east the limestone dips down to the Yangtze Gorge which is over 3000m below Bai Lian Guo and assumed to be the likely place for risings. The east west fault mentioned above actually meets the Yangtze gorge a kilometer to the south of the "second bend" where the river swings south.

Surprisingly for such altitude, permanent snow was absent from the mountains. Each of our areas (A–M) generally corresponded to a discrete ice scoured basin. In all the areas visited there was a great deal of talus from frost shattering of the higher cliffs but each of the areas also had extensive areas of good lapiaz. The limestone in these areas appeared to be pure when tested with acid and in the lower areas, where grass and rhododendron forest were present, very good examples of limestone pavement solution and shakeholes were found.

Despite three weeks of intense searching very few caves were found given the size of the area. More significantly none had significant air flow. The caves in Areas F and G were joint controlled pits with snow plugs and seemed the most promising. These appeared to be below what must once have been ice or snow filled cirques. Area H, which is mostly yak pasture, has extensive lapiaz and vegetation (being slightly lower) but no obvious entrances. Areas I, J and K were promising but too far from base to be visited easily. Most of the outstanding

leads are entrances in cliffs requiring climbing equipment. In particular the huge cliff below areas D, H and I and overlooking Dong Ba might repay a search.

An attempt to reach the intersection of the limestone with the Yangtze Gorge was thwarted by rain and flooding in the Yangtze. As yet the existence of risings is conjecture and may be difficult to prove given the difficulty of traversing through the gorge.

7 Personal stories

The entries in this section attempt to capture the human side and day-to-day flavour of the expedition.

A Very English Summer

Chris Rogers

The rain was pouring down as we huddled around our only link with the outside world, Pippa's illegally-smuggled long wave radio. Trying to control our shaking hands as we searched for an English radio station, we were dismayed to here the rain getting even louder. How could it rain so consistently? How could it be so cold? Finally, the crackling gave way to finest Home Counties as we found the BBC.

"Heavy rainstorms in southwest China over the past few days has caused further flooding and triggered landslides. Chinese state media reports the heaviest rainfall since 1954, with further rain to come...". We had heard enough. Dismayed, we climbed into our sleeping bags and prepared for the worst.

The rain had started almost as soon as we arrived on the mountain. The sky was heavily overcast as we finally arrived at Camp 2, after several days of trying to force a path through the thick undergrowth. Aware of the approaching darkness and feeling the altitude we found the only patch of ground that was bare of rocks and heather, right in the base of the valley. We soon had our tent pitched and after our regular veggie slop we were ready to sleep. The first drops of rain touched the roof of the tent as we drifted into dreams of the deep caves we would find the next day.

I opened my eyes. Or at least I thought I did. The darkness was complete, darkness I had only ever experienced in some deep cavern. The thought that I was in the depths of some undiscovered pot was confirmed by the incessant battering of water that could only be some waterfall crashing from an aven far above us. And yet there was something not quite right. Far from cold, unforgiving limestone beneath me, the ground was soft - like some bizarre waterbed. From the cold depths of half sleep, realisation dawned on me. Far from being in the unexplored depths, I was in a tent. And within a few minutes, the bowl that we had foolishly pitched in would collect enough water to overflow into our tent.

Carefully, trying to avoid capsizing the tent, I struggled to find a torch. Waking Gavin, we gingerly climbed out of the tent into the pouring rain. Even on the steeply sloping hillside the water was an inch deep. We pulled the pegs out, plucked the tent from the ground and moved it away from our near-swimming pool.

After my years of soft, European expeditions, I was not prepared for the hardships that we faced in China. In a last minute rush the day before my flight I had picked up a few things as afterthoughts — spare thermals and a lovely down sleeping bag. They proved essential for the cold, wet conditions on the mountain. We had chosen to experiment with lightweight gear for this expedition. Our tent was barely big enough for two, and nights were spent carefully avoiding movement that might cause the inner to come into contact with the outer, and allow the ever-present water to seep in.

The temperature fell below freezing on many nights. Hail froze and made a convenient method for collecting water. We had not packed serious winter equipment, but after six inches of snow fell two weeks into expedition we considered whether we would need it. The steep climb on loose scree over the high pass near camp became a real struggle as we kicked steps into the snow covered slopes and the slide down the other side was broken by the occasional cliff.

As we switched off the prim radio-voice of the BBC, and snuggled further into our sleeping bags, we would lie and listen to the drumming of the rain on the roof of the tent and huddle against the flash of lightning and clash of thunder echoing around the valley, and with luck drift into sleep. But despite the rain, and the snow, and the ice, our dreams would turn to the deep caves that lay beneath our feet. And when the clouds retreated, as they eventually did, and the sun came out, we would stand on the high mountains and look across at the far peaks, and down at the gorge, and think of the rain as it flowed through the limestone to the leaping river below.

In the morning, as we surveyed the lightning strikes on the cliff above our camp site, we switched the radio back on. As the sky cleared and the sun rose the voice of the BBC announcer came clear through the radio fuzz.

"Parts of England and Wales were lashed by severe weather last night, with flooding affecting thousands of homes and leaving many without water. Heavy rain led to flash floods and saw river levels rise, affecting swathes of central and western England."

With a smile, we looked at the rising sun. At least we weren't missing anything.

Chris Rogers

Playing Pool with a Square Cue Ball

As expeditions go this was an interesting one, it was certainly the biggest piece of "Alpine" karst any of us had ever encountered. Initially we could not see much for cloud and rain but at one point Gavin and I went over to the Dong Ba valley for a couple of days and the full scale of our search area became apparent. The village of Dong Ba, like most others in this region, has an outdoor pool table and as we played on a rare sunny day the limestone towered over us for two kilometers or more. And Dong Ba is not at resurgence level either; below the village fields the land drops off steeply for a further thousand meters to the Yangtze gorge.

Amazingly, given that the cue ball was decidedly cubic, Gavin managed to beat one of the locals on their own table, which also had topographic tendencies of its own. The local folk there were nice, if somewhat direct for Western taste, and welcomed us. Next time we visit that village we really must present them with a new cue ball.

Anyway, I digress. Searching for caves on the top of the hill was somewhat challenging. Persistent rain and cold for days on end did not help but finally we started to get better weather. The first sunny morning was quite memorable, sitting out in the sun below the peak of Bai Lian Guo, drinking tea and eating our meager daily ration of corn gruel. After several days of cloud and rain and near freezing temperatures sitting in the sun, albeit wrapped in several layers of thermals, felt positively tropical. And there were views we had not imagined. To the west the ice fields of Jade Dragon Mountain could be seen glittering in the distance. The most encouraging sign of good weather to come was the local yaks sauntering up out of the forests into Area A to graze. They looked totally at one with the high environment, much more so than we.

Making the most of the sunny interlude I took a walk up into the peak at the south end of C. From the ridge at around 4600m the view down into the, as yet, new Area G was impressive. Steep cliffs and talus slopes dropped in to a glacial basin with gravel floor but below that, where the grass began, were slabs bare limestone and dolines with numerous holes. That was an exciting day, dropping off the ridge and searching for pits one could have been in the Picos although subsequently none proved very deep.

More bad weather followed but towards the end a couple of fine days allowed us to explore areas further out to the southeast. H was my favorite being quite varied. The area was entered over a pass from D at close to 4500m and the higher areas comprised grass and limestone lapiaz and almost no talus. On the southwest end of the ridge separating D and H is a perched (glaciated) depression that overlooks the Dong Ba village a couple of kilometers below. The steeper ground down to Dong Ba was never searched due to lack of time.

Several days were spent searching H without much success but it was certainly a beautiful, if somewhat exhausting area to search. In the lower elevations the grass gave way to heather-like scrub and finally trees. The floor of the depression

is a flat grassy area maybe a kilometer across in a spectacular setting with limestone peaks all around. As if to add effect some of the area is covered by dense, moss floored rhododendron forest, which could be something out of Tolkien. In the grassy area we saw a couple of rough shacks occupied by yak herders and the area is used as pasture for their animals. There are many small sinks or shake holes in this area but none appeared to have air. To the southwest the lower areas of H "cliff out" into another glaciated basin and drops steeply down to Dong Ba again. This was not searched although there were a couple of prominent and inaccessible arch caves high on the cliffs.

Overall a beautiful expedition despite the weather and lack of major results but the effect of altitude and cold cannot be overstated.

Peter Hartley

A short walk to the Yangtze

Paul, Chris, Pip having headed home, Gavin, Pete and I spent some time thinking about what to do. Gavin didn't fancy the bus ride some 4 hours to Luoji. A "short" walk was planned to the likely region of any resurgence: where the dip of the limestone intersected the Yangtze.

The now customary vomming was largely missed: it seems the folks travelling to this valley were used to the winding roads and changes in altitude. So a relatively pleasant bus ride saw us deposited in what can only be described as a one horse town. Thankfully Pete had his phrase book and this avoided some potentially embarrassing miming when it came time to find the toilets. We also found out that the locals wanted to offer us someone's services as a guide. Having declined this kind offer, we ate and slept the night in what turned out to be quite the party centre.

An early start got us on the way. A road steadily descended to follow the river down valley. This we followed past numerous mine entrances that must have been dug to create the roads and houses. The first significant feature that we passed on the map was the hydroelectric station that looked like after another 5 years would become rubble further down the river. We then followed the road round to a village and saw some of the most impressive karst of the trip, all across a faulted gorge and rather inaccessible. The gentle pitter-patter of rain began and so the umbrellas went up.

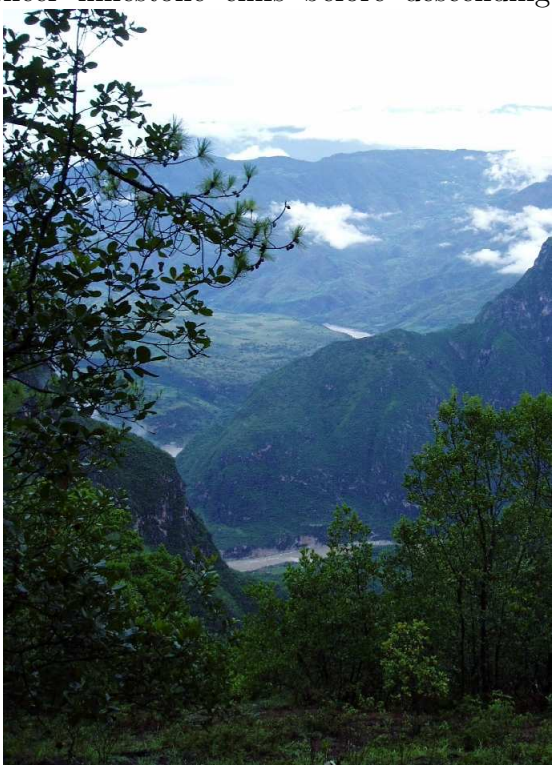
A steady climb to the tree line saw us pass numerous settlements with mad dogs and more frequently mad pigs beginning herded loudly by children. As each successive horizon was reached it started to become very apparent that we were going a long, long way... up!! There was a false turn that saw us climbing up worsening terrain in the rain: we fortunately reversed the climb up steep red mud with ankle-breaking outcrops of beautifully runnelled karst to return to the non-limestone region the other side of the fault. The advantage of this quagmire

was that we spotted our continuing path on the far side of the hill. Some skiing on mud saw us back to terrain-less-slippery-but-not-quite-firm. A continuing ascent finally abated and having ascended 900m in the rain the descent was started after some food and the last of the water. Having failed to bring the iodine, boiled water was to be our only source of drinking water. Ah, other than the rain water, and there was plenty of that!

Pete, drenched.

We re-assessed our situation since Pete, was not quite himself and the total supply of our food would be consumed in one more day and rethink was needed. So we decided to descend for two hours and see where we got to. There was a total of 1500m down to get to the Yangtze. After becoming more and more down-trodden with the rain and mud I was grateful it wasn't Yorkshire since the rain there defies gravity, often being sidewards whilst in part of China it just came straight down. Small mercies....

We walked down hill on narrow tracks next to what would probably have been a massive hanging valley with sheer limestone cliffs before descending between impressive precipices of the wondrous grey-white rock of these regions of limestone. At least it might have done if we could have seen it through the cloud. After our allotted 2.5 hours, a broken down cabin (looked rather like a pile of logs) was found and Pete's tarp was erected to serve two purposes: keep us dry and collect rain rainwater. Endless (about five) pans of coffee were brewed to warm us up and give us something to do. Then, wonder of wonders, the rains cleared and gave us a view of our descent that would follow in the morning. That was enough to convince us it wasnt to be. The roaring Yangtze with its white-peaked sediment-laden brown waves roared 1.3km below us and 3–5km away. This great bend in the Yangtze occurs as it pours out of



The view down to the Yangtze.

1000m-high cliffs of limestone. The ferocity of the Yangtze here deterred any thought of traversing on ledges above the swelling mass, hunting for equally massive resurgences. So photos were taken and the tent erected and a sleep followed after our 8 hours of walking mostly up hill.

Then the morning broke with a return to the views of the afternoon the day before.The abating in rainfall didn't last that long though and as we climbed back to the col the rains started again. We noted the individuals cropping the pine trees for resin and using very long sharp chisels. Then a suited Chinese man probably had the stranger experience, as he walked along this narrow mountain tracks, encountering not one but two bedraggled westerns slogging up the hill with massive sacks on their backs. A return to Luoji was finally made after 5 hours walking down hill and the rain stopped for some of this.

Anyone else wishing to explore this region in the future would need to have previsions for at least 3 days. Again the locals didn't seem to know what caves were.

Sam Allshorn

8 Medical report

We had two moderate illnesses, a moderate injury, and the usual collection of minor aches and pains that accompany any physically demanding expedition. Most expedition members also reported issues with altitude.

After arriving at our Camp One, we were feeling quite fresh and made our first attempt on the mountain. Pete reported shortness of breath, coughing, dizziness and lack of energy and we failed to find our way onto the mountain so we returned to camp. At camp, Petes condition did not improve. Pete is very experienced with altitudes similar to those in which we were working and has never experienced altitude sickness. One of his co-workers had recently suffered from Pneumonia. Pete indicated that he was very keen to stay on the hill. He was put on a course of Amoxycillin as a precautionary measure and we looked for any sign of improvement or otherwise. After several days of feeling ill, he returned to our base in Zhongdian. His condition moderately improved but it was felt that the pollutants in Zhongdian were aggravating the infection so he returned onto the hill. He continued to suffer throughout the beginning of the expedition.

Beardy suffered from bad cold-like symptoms about seven days after arriving on the hill. After waiting for an improvement it was decided that he should go to Zhongdian to recover. This took several days.

Gavin suffered from a sprained back, which put him out of action for about a week, and subsequently another four days. This is a long-standing recurring problem for him, and partly aggravated by the fact that he had lost some muscle

strength when laid up with a broken pelvis earlier in the year. It was mainly brought on by poor posture when sitting on the ground, cooking.

Almost everyone suffered at one point or another from aches and pains. The nature of the expedition was repeated, strenuous exercise and after a few weeks this began to take its toll. This was typically treated with ibuprofen and rest.

Most of the expedition members suffered from mild altitude sickness. The walk up the hill was staggered; everyone spent a night in Zhongdian (alt. 3100 m) and then at least one night at Camp 1 (alt. 3250 m). However there were no suitable camping site between Camp 1 and Camp 2 (alt. 4200 m). Instead acclimatisation was achieved by making one or two trips to Camp 2 before finally camping.

Chris Rogers, Medical Officer, & Pippa Crosby

9 Expedition accounts

All figures are in UK pounds.

Income

Grant income		
Mount Everest Foundation	800	
Ghar Parau Foundation	400	
Lyon Equipment Award	500	
Subtotal		1700
Personal contributions		7589
TOTAL		9289

Expenditure

Expedition expenditure		
Gear[1]	653	
Food, drinks, fuel	135	
Accomodation	166	
Local transport	146	
Subtotal		1099
Personal expenditure		
Flights	5600	
Internal UK transport	150	
Personal gear[2]	1800	
Insurance	420	
Visas	220	
Subtotal		8190
TOTAL		9289

[1] A large proportion of this equipment was passed onto the Hong Meigui in return for the use of their rope and other equipment.

[2] The figure for personal equipment is intended to cover only the cost of *sustaining* a set of personal expedition equipment through an expedition, i.e. wear and tear; it therefore significantly understates the amount spent by individuals on building up personal equipment stores, estimated at £1,000 each.