

Hong Meigui Tian Xing 2004 Expedition



Cave expedition to Tian Xing, Chongqing Municipality, China
29th September to 5th December 2004

Final Report

Report prepared by members of the Hong Meigui Tian Xing 2004 expedition. Edited by Erin Lynch.

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Hong Meigui Cave Exploration Society website: hongmeigui.net



Cover: Vladimir Yurkuns in Liù Chǐ Aōkǒu Xià Dòng. Photo by Brian Judd.

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Abstract

Hong Meigui Tian Xing 2004 was a 9-week, 15-member caving expedition to Tian Xing village of Wulong County, Chongqing Municipality in southwest China. The expedition was affiliated to the Hong Meigui Cave Exploration Society. The expedition continued work of previous Hong Meigui CES and China Caves Project expeditions to the same area.

A total of 9,665m of passage were surveyed, including significant extensions to Dà Kēng (depth 775m) and Liù Chǐ Aōkǒu Xià Dòng (depth 592m), which are now ranked as the second and fourth deepest caves in China. Numerous new entrances were located and explored, including Bamboo Cave (depth 356m) and Lánmù Shù Dòng (depth 230m), both with potential for further exploration.

A video documentary was made of the expedition. Biological specimens were collected as part of a ongoing collaboration with the Yunnan Institute of Zoology.

Follow-up expeditions are planned for 2005 and beyond.

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1 Overview

Introduction

The Tian Xing 2004 Expedition stayed in the mountainous karst area of Chongqing Municipality, Southwest China, for two months from October 2004. During this time the expedition explored and surveyed 9,665m of cave passage. Since most of the caves in the area are predominately vertical this was a satisfying achievement. The expedition contributed to a situation where five of the ten deepest known caves in China, including the four deepest, are now to be found in the relatively small area it has been working in.

The expedition team worked well with the local people and government and also with other nationalities who joined the expedition. Not every expedition member stayed for the whole time in the field but at various times, Russian, Swiss and American cavers joined with British cavers and our Chinese hosts to work together towards the expedition aims. The expedition ended with many more expedition members than first planned but this was of benefit to all concerned and contributed considerably to what the expedition achieved.



The expedition area

The landscape around Tian Xing is dominated by two major rivers: the Wu Jiang and the Fulong Jiang draining to the Chang Jiang (Yangtze) at Fuling. Tian Xing village straddles a ridge, with farms overlooking the newer centre. It lies on a shale layer amid limestones. The high land retains some ancient cone karst (fengcong) topography but the margins are deeply incised by several cycles of fluvial incision and the area NNE towards Wenfu is occupied by large closed depressions. The structure of the Cambrian limestones consists of folds with north-south axes, associated reverse faults, and major joints trending east-west. This means that water must flow across the geological structures to reach base level in the Fulong Jiang resurgences. There are also resurgences into the Wu Jiang, indicating deep and complicated phreatic systems

Summary of findings

The results of the expedition surpassed most original expectations. The expedition surveyed further in existing caves and mapped new entrances and new caves. The project area wasn't expanded to the southeast because the expedition was kept fully occupied in the immediate area of Tian Xing and the area north of it.

Dà Kēng

Two underground camps were established in Dà Kēng at the bottom of the 500m entrance pitch, (only one had been planned) and the cave was pushed further downstream in the strongly draughting lead found in

2003. This resulted in the exploration of 1,687.18m of passage and confirmed Dà Kēng's position as the second deepest cave in China. The bottom of the cave turned out to be complex. There were junctions with other passages, sections containing large fossil passage decorated with stalagmites and active river passages in which cascades, waterfalls, wet pitches and long sections of swimming had to be negotiated.

Liù Chǐ Aōkǒu Xià Dòng

Exploration in Liù Chǐ Aōkǒu Xià Dòng, a cave found in 2003 and left with a draughting 10m wide passage, did not go quite as expected. After exploring 250m, the Tian Xing 2004 expedition found the large passage disappeared into a very large boulder collapse. Fortunately all was not lost when a way was found around this via a small passage along which the cavers had to crawl and squeeze. This in turn led to larger passages and pitches beyond. Eventually 3,485m of cave was surveyed here and the cave continues. In an attempt to find an easier route into Liù Chǐ Aōkǒu Xià other caves were explored nearby. All of these became sizeable caves in their own right but a connection to Liù Chǐ Aōkǒu Xià proved elusive.

Northern area

There were also some exciting finds in the area north of Tian Xing. In this case it was thought it might be possible to find a bottom or middle entrance to the caves found earlier. Numerous entrances were noted and the caves explored proved intriguing. Perhaps the best of these caves was situated in a large clump of bamboo and mature trees. A beautiful 40m shaft in daylight led to clean washed passage cascading down a series of pitches before becoming almost horizontal. Instead of sumping and filling with water, as thought possible, it continued until 1714.2m had been surveyed from the entrance. The expedition was stopped by a boulder blockage but this is probably only a temporary halt to exploration, as a strong draught in this region indicates it may well be possible to get round it.

Speleobiology

Expedition members looked for but did not find any "cave" fish this year although there were numerous white tadpoles and other animals noted. Specimens were collected and sent to the appropriate specialists for further study.

Photo, video, and sound documentation

The expedition took hundreds of underground and surface photographs which have all been catalogued and are available on the expedition website. A video is currently being edited along with sound recordings made underground.

Future work

Ten years of expeditions to Tian Xing have surveyed over 30 kilometres of cave (30,190m). The Tian Xing 2004 expedition added nearly 10 kilometres to this total (9,664.9m) and positioned many more cave entrances for the area database and map. All of these will provide ample exploration opportunities for the future. Another area for future investigation is derived from the fact that a large number of caves and passages have again been found in very close proximity to one another. As yet not one cave in Tian Xing has been joined to another cave. This is all the more incredible as large caves often run parallel to one another and are often separated from each other by only a few metres. Trying to determine if they do in fact

Main caves explored, with length surveyed on the Tian Xing 2004 expedition:

Name	Length
Liù Chǐ Aōkǒu Xià Dòng	3,485.00
Liù Chǐ Aōkǒu Shàng Dòng	717.87
Su Jia Bao	54.94
Dà Kēng	1,687.18
Kēng Dàng Dàng	283.21
Mí Dòng	338.97
Lánmù Shù Dòng	843.13
Chá Zǐ Tan	329.90
Bamboo Cave	1,714.20
Tong Luo Jing	62.34
48H-I12-96	148.16
TOTAL	9,664.90

Figures in metres.

link up or if they were formed separately will be an interesting study in cave formation and an exploration challenge.

There is still much to be discovered in the Tian Xing area. There is plenty of potential in the caves that have been explored and the possibilities of the other cave entrances have been enhanced by what was found on the Tian Xing 2004 expedition. One final point, which the expedition would strongly recommend, is that the training and encouragement of Chinese cavers in vertical techniques and in cave surveying be made a specific aim of a future expedition. We believe this is important to continue to foster an equal partnership in the ongoing exploration of Chinese karst.

2 Expedition members

RG	Rob “It hurts my cuts too much to wash” Garrett	Treasurer
DC	Duncan “I feel dreadful” Collis	
BJ	Brian “Cherry Picker” Judd	Expedition leader
DP	Dima “Robotnik” Patshin	
PL	Peter “Machine” Lubimov	Videographer
IA	Ilya “Dyda” Akchmetchin	
MG	Marcia “Nuhair” Grigorieva	
VY	Vladimir “Speedy” Yurkuns	
MR	Matt “Wall of Sound” Ryan	
IB	Ilya “Yogi” Boiko	
KB	Kirill “Flakon” Bagrii	
EL	Erin “Biggles” Lynch	Survey officer
OT	Oliver “Chocy” Trueb	
BK	Barry “Kidney Stones” Kennedy	
DB	Dave “Dive” Barrett	

3 Expedition diary

29/9	DC, RG BJ	Leave Yangshuo. Leaves Eyemouth.
1/10	DC, RG, BJ MR	Arrive Wulong. Leaves Chengdu.
2/10	DC, RG, BJ, MR	Bus to Tian Xing.
3/10	IB, IA, VY, MG DP, PL, KB RG, DC, MR BJ	Arrive Tian Xing. Rig Liù Chǐ Aōkǒu Xià Dòng (LCAKX). Rig Dà Kēng.
4/10	RG, IB, IA, KB DC, MR, BJ, VY	Rig and survey Liù Chǐ Aōkǒu Shàng Dòng (LCAKS). Film LCAKX.
5/10	MR, BJ RG, DC PL, DP, IA	Rig and survey Su Jia Ba. Surface prospecting. Dà Kēng.
6/10	DC EL MR, BJ, IB, IA, VY, MG, DP, PL, KB	Rig LCAKX. Arrives Tian Xing. LCAKS.
7/10	MR, BJ IA, DP, KB IB, VY, MG, PL	Rig and survey Su Jia Ba. Rig and survey LCAKS. Film in Qian Kou.

8/10	BJ, PL, VY, DP RG, DC MR	Establish camp and rig bottom pitches in Dà Kēng. Survey downstream LCAKX. Leaves expedition.
9/10	MG BJ, VY PL, DP	Leaves expedition. Survey Pony Express in Dà Kēng. Film in Dà Kēng
10/10	PL, DP BJ, VY RG, DC	Film and survey in Dà Kēng. Photograph in Dà Kēng. Survey Beyond Potato in LCAKX.
11/10	PL, DP, BJ, VY IB, KB	Prusik out of Dà Kēng. Check leads in Yan Feng Tuo.
12/10	RG, DC IA, PL, DP, IB	Prospect Xiè Jiā Wān 1 and 2, Dà Bǎo Dòng. Film Dà Kēng.
13/10	IB, IA, VY, DP, PL, KB, BJ, RG	Film Mí Dòng
14/10	All	Rest day.
15/10	IB, IA, VY, DP, PL, KB	Leave expedition.
16/10	BJ, RG	Survey Dysentery in LCAKX.
17/10	EL, DC RG, BJ	Survey Right Kind of Disco in LCAKX. Find Tuo Ta Bo.
18/10	All	Rest day.
19/10	DC RG, BJ	Finds sink above LCAKX avens. Survey and rig You Lucky Lucky Bastards LCAKX.
20/10	DB DC, DB, BJ DB, RG, EL	Arrives Tian Xing. Surface prospecting. Dig above LCAKX.
21/10	DB, DC RG, BJ OT	Survey and rig Riggwelter in LCAKX. Rig entrance to Kēng Dàng Dàng. Arrives Tian Xing.
22/10	EL, RG OT, BJ DC	Survey upstream LCAKX. Survey Mí Dòng Finds Lánmù Shù Dong (LMS).
23/10	RG, DC, EL OT, BJ, DB	Survey LMS entrance. Camp in Dà Kēng
24/10	RG, DC BK OT, BJ, DB	Rig and survey Cats and Dogs, Old Bone in LMS. Arrives Tian Xing. Survey Lake Section and Topless in Dà Kēng.
25/10	OT, BJ, DB	Camp in Dà Kēng.
26/10	DC, BK, RG, EL OT, BJ, DB	Rig Cloud Burst, survey Hope in LMS. Prusik out of Dà Kēng.
27/10	OT DB, BK, BJ	Leaves expedition. Surface recce new shafts, survey Chá Zǐ Tan.
28/10	BJ, BK, DB, EL	Photograph and derig Dà Kēng.
29/10	DB, BK, BJ, RG	Derig Dà Kēng.
30/10	BJ, MR, RG DB, BK EL, DC	Rig Kēng Dàng Dàng. Wash rope. Rig and survey to top of The Penetrator in LCAKX
31/10	BJ, DB, BK	Survey and rig Kēng Dàng Dàng.
01/11	BJ, DB, BK	Find new entrances, rig Chá Zǐ Tan.
02/11	BJ, DB BK	Rig to third pitch, survey, and derig Chá Zǐ Tan. Furong Dong.
03/11	BJ, DB	Wash and clean equipment.

	DC, EL, RG	Rig The Penetrator, survey Blue Balls in LCAKX.
04/11	BJ, DB, BK	Rig and survey Bamboo Cave.
05/11	BJ, DB, BK	Bamboo Cave rig to 80m, survey.
	EL, DC	Surface survey Tian Xing to LMS.
06/11	BJ, DB, BK	Derig Kēng Dàng Dàng and wash rope.
	EL, DC	Surface survey.
07/11	BJ, DB	Rig Drafty Pitch to horizontal passage in Bamboo Cave.
	BK	Leaves expedition.
	RG, EL, DC	Survey Tong Wei Jing.
08/11	All	Rest day.
09/11	RG, BJ, DB	Survey below 65m pitch in Bamboo Cave.
	EL, DC	Bolt and survey Occluded Front in LMS.
10/11	All	Equipment repairs.
11/11	BJ, DB	Derig Bamboo Cave.
	DC, EL	Survey LCAKS.
12/11	BJ	Tian Xing - Chongqing.
13/11	BJ	Chongqing - Eyemouth.
15/11	RG, DC, EL	Survey Big Bang and derig LCAKX to Change of Scale.
16/11	RG, DC, EL	Return from overnight derig, nurse wounds.
17/11	All	Wash rope and rigging equipment.
18/11	EL	Photographs entrances near Dà Kēng.
	DB	Surface prospecting near Wenfu.
19/11	RG, DC	Finish LCAKX derig.
	EL	Scans survey notes.
20/11	All	Wash rope.
21/11	DB	Leaves expedition.
22/11	RG, DC	Survey and derig LMS.
	EL	Survey LCAKS.
23/11	All	Wash rope.
24-29/11	All	Annual equipment clean and inventory.
30/11	RG, DC, EL	Volunteer at local school, leave Tian Xing.
1-2/12	RG, DC, EL	Establish permanent equipment store in Wulong
3-5/12	RG, DC, EL	Wulong - Yangshuo.

4 Administration and logistics

Travel and equipment transport

Expedition members coming from abroad flew into Beijing or Hong Kong, then took internal flights to Chongqing. Expedition members based in China travelled to Chongqing by train. From Chongqing most members travelled to Jiang Kou by public bus, although a group of six travelling during the October holiday week hired a private van to avoid difficulties purchasing tickets. From Jiang Kou members proceeded to Tian Xing either by public bus, motorbike or van hired in Jiang Kou.

Some equipment was carried from the UK with expedition members, but a large part of the necessary gear was shipped from the Hong Meigui CES Yunnan 2004 expedition or sourced from the Hong Meigui CES tackle store in Guilin. Following the expedition, a permanent tackle store was established in Wulong to reduce future shipping expenses.

During the expedition motorbikes were occasionally hired to transport cavers and rigging equipment to cave entrances. These journeys normally cost 10 RMB per bike.

Food and accommodation

The expedition was housed in two concrete building in the centre of Tian Xing village. The accommodation was divided into an equipment store/changing room, an office/common-room/bunk-room, and two further bunk-rooms. It was rented to the expedition at a rate of 4 RMB per person per night. This year's accommodation was a significant improvement over previous years, as the concrete construction was much warmer and less rodent-infested than the wooden farmhouse used in 2002, and it was more spacious than the single-family building used in 2003. The village does not have plumbing, but expedition hygiene was maintained by heating water over a petrol stove and sponging down in a plastic wash basin.

Two meals a day were prepared for the expedition by a local family at a cost of 4 RMB per person per meal. It should be noted that the village market did not offer a great enough quantity of fresh meat and vegetables to feed an expedition of this size (9 people on average). The cooks had to travel to a larger village on an almost daily basis to buy supplies. This was mitigated by the fact that the family responsible for the cooking owned a motorbike, but the same could not be said of most families in the area. Large expeditions should consider the impact of their catering demands on the local food supply.

The expedition bought bottled water and beer in bulk from a shop in the village. A deposit-based recycling system is used in China, so it was easy to recycle plastic and glass bottles during and after the expedition.

Permission and permits

Travel and caving in China requires a tourist visa. These were obtained from the Chinese Consulate in Manchester, the Chinese Embassy in London, or in Hong Kong. Upon arrival in Jiang Kou expedition members registered with the Public Security Bureau. No further permits or permissions were required for this expedition.

Techniques

Vertical caving

Exploration of vertical caves used single rope technique (SRT). All expedition members were experienced cavers already well versed in this technique. Details of both equipment and technique are given in, for example, *Caving Practice and Equipment* by David Judson.

Specifically, the majority of the rigging on the expedition was done with 57mm M8 thru bolts and 24 volt Bosch GBH 24VRE hammer drills. 142 thru bolts were placed during the expedition.

Underground camps

An underground camp was used to permit exploration of the further reaches of Dà Kēng, and provide a higher margin of safety. The camp consisted of a tarpaulin suspended from string, which excluded the draught and helped retain heat. A combination of sleeping bag and hammock or bivi bag with roll mat was sufficient for comfortable sleep. Cooking was done on a KOVEA Mini-Stove with isobutane, which was deemed safer than petrol for transport in the cave. Campers ate Pack-N-Go dehydrated meals and an assortment of soups and hot drinks. Due to concerns about water being contaminated with farm waste, all water obtained from drips was boiled or treated with iodine before it was consumed. On camping trips first aid supplies consisted of a substantial kit left at the camp, and smaller personal kits carried by expedition members. All camp materials were removed from the cave at the end of the expedition.

Documentation

Recording cave entrance locations

Entrance locations were recorded by means of GPS (Global Positioning System) hand units. Readings were recorded as UTM grid coordinates, using the WGS84 datum. The UTM zone is 48R.

For further accuracy, surface surveys using compass, inclinometer, and tape measure were conducted between three major entrances: Liù Chǐ Aōkǒu Xià Dòng, Liù Chǐ Aōkǒu Shàng Dòng, Lánmù Shù Dong.

Cave surveying

Caves explored by the expedition were surveyed to the highest reasonable standard using compass, inclinometer, and tape measure. In the majority of cases, this meant surveying to British Cave Research Association Grade 5b-d. For each significant cave, underground sketches were made of the plan, profile, and cross-sections at a scale of 1:500 or 1:1000. Additional sketches were made of the rigging used, noting pitch length, rope length, and type and placement of belays.

Survey symbols

The following survey symbols were used. The symbols are loosely based on the UIS symbol set.

	Passage walls		Aven		Stalagmite		Mud/clay		19:00 21.09.2003 Draught with date
	Unsurveyed/assumed walls		Pit		Stalactite		Sand/silt		861m Altitude
	Underlying passage		Aven-Pit		Column		Cobbles	Elevation symbols	
	Connecting shaft		Unexplored		Curtain		Large breakdown		
	Entrance shaft (10m)		Rising		Helictite		Boulders		Ledge/traverse
	Drip line		Sink		Soda straws		Angular boulders		Ceiling channel
	Cliff with climb (3m)		Water flow		Popcorn		Guano		Natural belay
	Floor trench		Water		Crystals		Rats		Bolt y-hang
	Ceiling height change		Drips/inlet		Calcite mound		Vegetation		Deviation
	Ceiling channel		Sump		Flowstone		Camp		Rope protector
	Slope (points downhill)		Gour pools		Muddy flowstone		Human activity		Pitch length

Cave numbering

To aid in record keeping, each cave was assigned a unique identifier of the form 48H-I12-XXX. The 48H-I12 component refers to the sheet from the Chinese 1:100,000 map series which corresponds to Tian Xing. The sheet covers an area 20 minutes N-S by 30 minutes E-W and all caves with entrances on the same sheet were given the same prefix. This system is used across all Hong Meigui expeditions, and provides a convenient way of organizing information geographically and generating unique identifiers.

Cave database

Organization of the expedition's records was achieved by referencing all survey notes, surveys, survey data, entrance photos, gps locations, and rigging guides by the unique cave identifiers. The data was then entered into an online xml database covering all caves explored by Hong Meigui expedition. A web interface provides convenient access to the data.

Sound recordings

The mini-disc recorder and microphone purchased by the expedition proved themselves useful tools, particularly of use in recording conversations with locals as this allowed leisurely analysis of the Chinese, extracting names, directions and descriptions of the caves. Along with the interviews, expedition members were able to record notes and thoughts about the caves, of particular benefit for those area which were difficult or time consuming to reach. Combined with photographs of entrances and paper notes, the sound equipment proved effective tools for recording information on prospecting trips and providing a general diary of events. In a similar role the equipment was also used to record discussion and decisions during group meetings and the feelings of group members before and after big trips.

The microphone was also used in conjunction with video recording equipment to document trips underground, providing much better sound quality than that available with camcorder on-board microphones. Some of the audio captured independently was also of use in editing a video documentary of the expedition.

Video documentary

The expedition produced a video documentary encompassing both the exploration of caves and life in the village of Tian Xing. Filming was conducted both on the surface and underground, where lighting and rugging the equipment posed a particular challenge. Filming equipment included two Vega 2 waterproof

lights by Technisub, Sony InfoLithium camera batteries, a Sony DCR TVR-940 camera, and a generic-brand waterproof camera housing.

The finished film, entitled “Caving and Sleeping in Tian Xing” has a 25 minute running time. It was shown at Hidden Earth 2005, the UK national caving conference; at a Perovo-Speleo team meeting; and at a meeting of the Russian Geographical Society’s Speleology and Karstology section.

Photography

The expedition used a mixture of film and digital cameras for both surface and underground photography. Flash guns enclosed in transparent Peli-brand waterproof cases were used wherever there was risk of submersion. PF200 flashbulbs, provided by Meggaflash, were used for large shafts, including the 284m entrance shaft to Dà Kēng. Slave units were used to synchronize the flashes with the camera’s shutter.

Research materials and information sources

The expedition relied heavily on first-hand knowledge of the local infrastructure, culture, etc., gained during the Hong Meigui Tian Xing 2002 and 2003 expeditions, as well as information provided by Prof. Zhu Xuewen of the Institute of Karst Geology.

5 Cave locations and descriptions

Ø 48H-I12-2: Đà Bảo Động (Big Treasure Cave)

Location: UTM: 0786249 3235024 Altitude: 1247

Take road from Tian Xing towards Mi Dông. At Mi Dông Junction take right fork, 100m later take path on left (tombs on right). Follow path to a T-junction at a col. Turn left then almost immediately right. When the path breaks out of vegetation into a field, go slightly left of straight ahead. Entrance is in trees near the summit.

Description: Shaft at the bottom of a ~20m wide steep-sided depression. Difficult to see, but probably 4mx2m. Easy to approach. Can rig off trees for the start.

Ø 48H-I12-4: Đà Kēng (Big Shaft)

Depth: 775 Length: 4274 Plan: 3626

Warning: In wet weather climbs beyond The Ferryman may become impassable. Wetsuits and buoyancy aids are essential for swims, but too hot for traverses. Because of the wind and water, hypothermia is a concern when pushing Topless Rift .

Location: UTM: 0784688 3235181 Altitude: 1077

Near path to left of valley leading down below Qikeng Dông, just above stream bed by edge of small tobacco field at start of thick vegetation which hides the 10m diameter entrance. Leave path to right just before some sloping slabs of bare rock on left of path as it ascends.

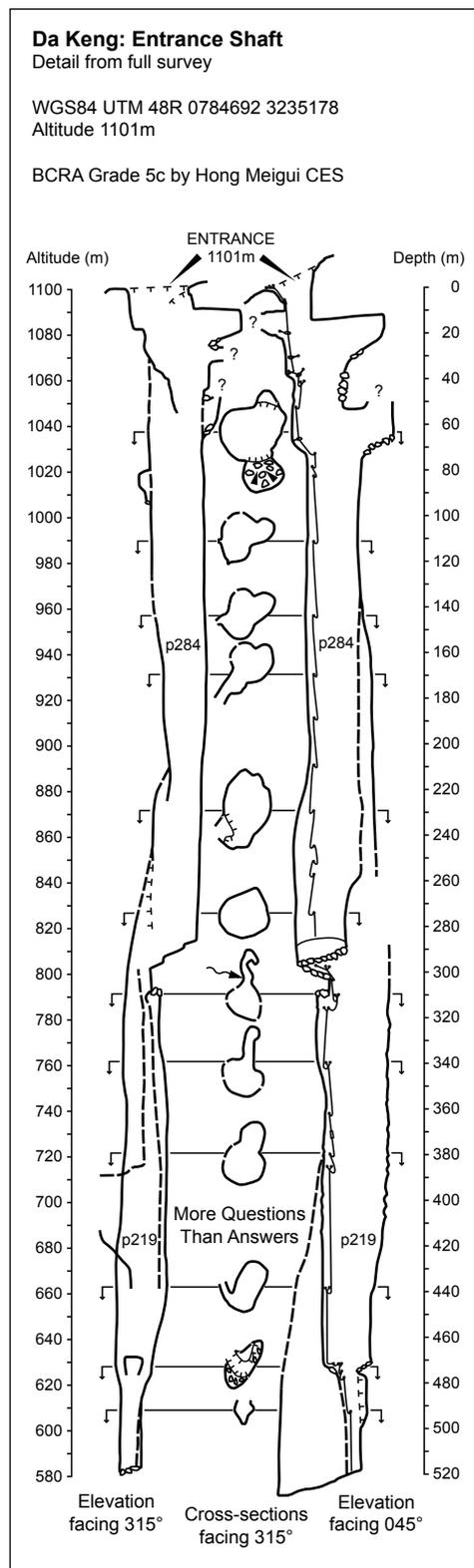
Description: Đà Kēng's entrance shaft is 284m deep. It begins as a 15m wide shaft in vegetation, best rigged from the north. Traverse over loose earth and foliage to a tree-belay on the western lip. At this point the shaft widens significantly, with a 20m flat-roofed undercut on the eastern side. Two large calcite mounds can be seen on a ledge below this undercut and there is a possible lead at the far corner of the ledge. Continuing down, the rope is rigged past light vegetation to a 5m wide ledge covered with organic debris while an unexplored rift enters from the north. A further 30m down, a second sloping ledge is reached. On the far side of the shaft there is a eye-hole onto a boulder-floored passage which may be part of a parallel shaft. Beyond this, the main shaft continues down vertically with numerous rebelay, finally landing on a 20m ledge of sloping rubble which comes to the top of the 215m More Questions Than Answers.

More Questions Than Answers

From a cave formation standpoint, More Questions Than Answers and the entrance shaft are a single impressive 499m shaft, being separated only by wedged boulders that form the floor of the entrance shaft. More Questions Than Answers is rigged with a traverse to a y-hang, a short rebelay to get past the boulders and then a number of longer hangs, both free and against the wall. After 170m a spray-lashed ledge is reached. A further 45m of descent gains the floor.

The Answer

From the bottom of the pitches the base of the shaft curves around as a short section of muddy flat-floored passage where the water sinks. Camp is at the far end. The way on is The Answer, a muddy popcorn covered hole down to a body-sized tube. Thrutching for 5m



gains a step down into larger rift passage where a climb down leads to the head of a 9m pitch. The pitch can be free-climbed, but is best rigged with a traverse line off a clump of rocks chocked in the rift to a y-hang off a stal and spit for a free-hang. At the bottom of the pitch the passage is a more comfortable 4 meters wide. Following the rift back the way you came it chokes almost immediately, while ahead the passage narrows to a rift before briefly widening and then degenerating to another short crawl. A step down gains larger passage where two short climbs down lead to the head of a 35m pitch. A boss provides a solid backup to a y-hang rigged off a spit and thru bolt (spit set with WRONG SIZE CONE). Three meters down a thru bolt in calcite provides the main hang. At the top the rope rubs against one of several popcorn covered stal (care not to kick them down), but this is sorted by a rope protector. At -10m the rope lands on a large muddy boss. Below the boss a small column provides a deviation which eliminates the rub. Recommend re-rigging from the top with a traverse out along the right-hand wall to a free-hang.

The pitch lands in a 4m wide high rift passage with a small stream running between large cobble and mud banks. Doubling back in the rift a short climb up over mud and cobbles gains a brief section of decorated passage (featuring a pool fed by rapid drips onto a white calcite boss) which ends in a calcite choke. The way on is to follow the water downstream to a T-junction where the ceiling comes down and there is a notable increase in draft. To the left (upstream) a crawl leads to a high aven followed by a longer crawl in water to the base of a 15m pitch where the water enters. Passage can be seen going off at the top and all the draft seems to be coming from this aven. Beyond is a short section of rift to a calcite choke where a 5m climb up gains a small hole that pops out halfway down a 30m? shaft which was not descended.

Downstream at the T-junction is stooping passage with a nice layered-sediment floor which continues for some distance to a windy flat-out crawl. Beyond the passage enlarges first to crawling and then more stooping, finally reaching walking-size at a W-bend. In one corner of the W-bend, there are numerous bat bones. The passage continues slightly larger than before, with a channel between ledges and occasional boulder obstacles. The passage opens out and a low, draughting inlet is passed on the right. After 40m the passage degenerates to a crawl beneath boulders, with an unexplored lead up a climb. The passage slowly enlarges to stooping height, and after 70m, Pretty Inlet is met .

Pretty Inlet

Heading upstream in Pretty Inlet begins with a climb, followed by well-decorated stooping and walking height passage. This goes for 40m to a sharp corner with a choice of ways. The sound of water can be heard through a small hole down, while a 15m climb up ends in the middle of a shaft. Continuing upstream for 10m comes to a climb over boulders, beyond which the passage is considerably smaller. It rapidly degenerates to a calcited crawl which ends at a small rising sump.

Beyond Pretty inlet, the main passage continues to enlarge, passing a wide oxbow with copious amounts of guano and a possible high level lead. After 150m the passage reaches Horse Head Junction .

Horse Head Junction

There are three ways on from Horse Head Junction . To the left Pony Express goes upstream along an inlet. To the right The Ferryman is initially dry but soon becomes the downstream continuation of the main streamway. The stream itself sinks in an impenetrable slot at Horse Head Junction, but it can be followed down a nearby hole in the floor to Wet Pitch .

Wet Pitch

An 8m climb down lands in a small chamber off a 2-3m wide hading rift. After a further sloping climb down the main stream enters. From here the passage hades downwards quite steeply, descending over a series of climbs and a 9m pitch to a final small sump at -668m.

Pony Express

To the left from Horse Head Junction mud-floored walking passage goes for 50m to a shallow pit where a stream enters from above (unexplored). Beyond the walking passage continues for another 50m to an aven and then a T-junction. A stream enters from the left and flows down a rift to the right. The rift is gnarly, tight, and unsurveyed, but runs under the main walking passage to connect to Wet Pitch . Upstream the passage is quite wet, with pools and a number of waterfall climbs. It continues, but has no draught.

The Ferryman

To the right at Horse Head Junction, mud floored walking passage with a ledge high on the left hand side leads to a climb down to a cracked mud floor followed by a waist-deep wade through a pool fed by a trickle down flowstone. It is possible to traverse around the pool, but not easy A climb up on the far side of the pool leads to a short pitch/handline climb down over more formations and gour pools.

Downstream small pitches down flowstone lead to a perched sump, The passage continues along well-decorated fossil rifts until the main stream (now larger than before) enters through boulders. The passage is extremely sporting with climbs down cascades along rifts, and a couple of wet pitches to a series of swims. After these a large fossil passage ends at a junction where the way ahead splits. To the left, walking passage leads to a large column and a pitch followed by 200m of nice walking passage which unfortunately sumps. The other lead, Topless Rift, continues extremely wet with more swims, a big inlet coming down an aven and a small, strongly draughting, climb. This leads to more swimming. Passage continues. The final station is at the top of a boulder climb on a big lump that comes out of the side of the passage (climb around it) and is marked with tape and paint.

Tackle:

Pitch	Length	Rope	Rigging		
Entrance Pitch	284	350	traverse	3 thru bolts	
			deviation	1 sling around stump	
				1 sling around tree	
			deviation	1 thru bolt	
			deviation	1 thru bolt	
			y-hang	2 thru bolts	
			deviation	1 thru bolt	
				1 thru bolt	
			y-hang	2 thru bolts	
			deviation	1 thru bolt	
				1 thru bolt	
			rope protector		
				1 thru bolt	
				1 thru bolt	
				1 thru bolt	-101m
				1 thru bolt	-103m
				1 thru bolt	-132m
				1 thru bolt	-164m
				1 thru bolt	-175m
				1 thru bolt	-189m
				1 thru bolt	-209m
				1 thru bolt	-229m
				1 thru bolt	-244m
				1 thru bolt	-252m
				1 thru bolt	-257m
			rope protector		
				1 thru bolt	-273m
More Questions Than Answers	215	270	traverse	1 thru bolt	
			y-hang	2 thru bolts	
				1 thru bolt	-5m
			y-hang	2 thru bolts	-12m
			rope protector		
			y-hang	2 thru bolts	-17m
			y-hang	2 thru bolts	-41m
				1 thru bolt	-63m

				1 thru bolt	-81m
			y-hang	2 thru bolts	-86m
				1 spit	
				1 spit	
			y-hang	1 spit	
				2 thru bolts	-139m
				1 spit	
			traverse	1 thru bolt	-172m
			y-hang	2 thru bolts	-172m
				1 thru bolt	-175m
				1 thru bolt	-177m
				1 thru bolt	-192m
Handjob Pitch	10	15	traverse	1 sling around chockstone	
			y-hang	1 spit, 1 sling	
Popcorn Pitch	30	45	traverse	1 thru bolt	
				1 spit	
			1 thru bolt		
			rope protector		
			deviation	1 sling	
Ferryman Climb	6	8		1 sling	
				1 sling	
Ferryman Pitch 1	9	20		1 sling	
			rope protector		
Ferryman Pitch 2	9	20		1 sling	
Lake Section Pitch	13	20		1 sling	
			rope protector		
Topless Rift Climb		10		1 sling	
Total	576	758			

Ø 48H-I12-29: Liù Chǐ Aōkǒu Xià Dòng

Depth: 592 Length: 4352 Plan: 3865

Location: UTM: 0785124 3235169 Altitude: 1234

Head towards Qikeng from Tian Xing. After first shortcut rejoins road, take the immediate uphill continuation of the path.

Description: The entrance to the cave is an obscure slot among crags. It is strongly draughting, but the draught changes direction according to the outside temperature. A small hole has been drilled in the crag near the entrance as a permanent survey station.

Entrance Series

The entrance pitch is initially rather tight, but immediately widens. There is a ledge after 3m and then a further 2m to the floor. Here there are two ways on to the north.

A short climb up leads into a crawl which soon becomes a body sized tube, which passes round a sharp right-hand corner after 10m and then a squeeze through a stal grille. After a further 10m the passage enlarges and there is a traverse round a 3m deep hole, the bottom of which is reached by following the passage beyond the traverse to a small chamber where there are two upstream passages (one too low) and a downstream one, which leads via some damp crawling to the passage below the traverse. Continuing

downstream, the passage develops a narrow vadose trench, and gradually enlarges until the main passage is reached just at the start of the Long Leggedy Thing traverse.

Back at the bottom of the entrance pitch, at floor level is a rubble slope down into a crawl, which gradually decreases in height and passes through some puddles until after 10m it emerges into a walking size passage, which after a further 10m reaches the Long Leggedy Thing traverse. Here the alternative route from the entrance enters on the right.

Long Leggedy Things

Long Leggedy Thing is a traverse above a narrow vadose trench, which can be followed at several different levels; at the top it is wide and often has large but rather slippery ledges. Lower down the traverse is narrow and occasionally blocked partially by rocks. After 30m is a climb down to floor level, where progress is briefly rather awkward before the passage enlarges for 20m to a large right-hand corner with a fine stalagmite. The next 10m is again rather awkward before enlarging at a junction with an inlet to the right, which has not been pushed. To the left, the passage immediately reaches the head of narrow pitch, The Big Pitch .

The Big Pitch

The Big Pitch is descended by traversing out for about 5m until the rift widens enough to get down, and is all of 8m deep. A traverse beyond the pitch head reaches a high level passage which has not been explored. At the foot of The Big Pitch, two more small pitches follow immediately, and the way on, Screaming Frogs is initially a 2m wide walking passage. However, after only a few metres, where two passages enter on the left, the way ahead narrows. The passage can be followed either by stooping at floor level, or by climbing up to a wider crawl. Either way, after 10m, a chamber at the base of an aven is reached; care should be taken when entering the chamber to avoid damaging a small cluster of delicate stals on the right wall.

The Cliché

Beyond the aven, the passage runs straight for 45m with a trench in the floor which can easily be traversed over, and an inlet on the left after 30m; beyond the inlet the passage narrows, and progress is made by traversing upwards. The passage abruptly turns through 120 degrees to the right, and the corner can be passed either at ceiling level (with a climb down afterwards) or by crawling through a stal grille lower down. A fine stal column about 3m high gives this section of passage its name, The Cliché . It's possible to get back down to stream level here, but both upstream and downstream become too tight.

The way on is about 4m above the floor, reaching a pitch back down to the stream after a few metres. At ceiling level here there is an unexplored crawl to the left, and also a possible traverse over the pitch (the traverse at the level of the pitch head merely gains the top of the wedged rocks on the other side of the chamber, with no way on).

At the foot of the pitch, the passage is initially 2m wide and walking-height, but soon a choice of several smaller ways on is reached - stream level is the most straightforward. A stooping rift soon turns into a gravelly crawl round a left-hand corner before enlarging briefly. The continuing stoop/crawl passes a hole up on the right after 15m, where there is a dry inlet and a high level passage which is assumed to bypass the remainder of the crawl. The passage enlarges after a few more metres. A short section of walking passage with boulders gives way to rift with a calcited shelf on the left. Climb up here to a chamber with a floor of boulders and flowstone blockage at the far end. A small stream enters high on the left (possibly too tight) and the way on is to climb through the calcite grill, taking care with the poised boulders. The easiest way through the grill is to follow the right hand side at first and then cross over to the left and climb down the mound of shattered rock. Here the passage splits into two levels.

The upper level continues with an inlet entering from high on the right. After 20m there is a hole down on the left which connects to the lower level. A small inlet (unexplored) enters on the far side of the pit, while a traverse along the right gains a narrow continuation which has not been pushed to a conclusion.

The lower level is best reached by doubling back from the mound of shattered rock and climbing down 2m into passage with the continuation of the stream from before. Upstream ends in the bottom part of the flowstone blockage, while downstream is 3m high, 3m wide comfortable walking passage with the occasional traverse around pools. After 20m the passage opens out and the upper level can be seen above.in

from above.

Combined Tactics

Along the passage a clamber over (or under) boulders leads to a cliff of calcite, boulders, and mud. The way down is via Combined Tactics Climb, an overhung 2m climb in the streamway, or through a wet squeeze a few metres back from the climb. The head of the climb pinches in, making it difficult even with a handline. It would be best rigged with a ladder and long sling belayed to nearby stals.

The climb lands in a 7m wide chamber where an inlet enters from passage high on the left (a few bolts or a daring climber needed). To the right the stream flows into a low crawl that ends in a choke. Straight ahead climb up and over breakdown to a clean washed circle of limestone with a loose climb of mud and rocks on the far side. At the top of the climb there are 2 ways on: To the right and down is a low, pretty crawl (unsurveyed) which connects to the streamway. The better option is ahead, where a stoop followed by a short section of keyhole passage regains to the streamway beyond the worst of the low bits. The streamway continues for 15m as a crawl/stoop with a network of higher, unpushed crawls on the left hand side.

WARNING: this section of streamway is the only flood risk thus far encountered in the cave. Efforts should be made to find a bypass.

The 260

The crawl in the streamway ends at The 260, a 2.6m pitch. The pitch overhangs and the rock is not good for bolting; however there is a large nose of rock a few metres back on the right hand side. A rope protector is needed on the edge, and the stream runs down the rope and makes things generally unpleasant. It is likely that a crawl on the left a few metres before the pitch will provide a bypass.

Below the pitch, a climb up on the left leads to a junction where a crawl to the left probably bypasses the pitch is unexplored. Just beyond the climb, also on the left, is a crawl at roof level, also unexplored. Continuing downstream past a fragile rock bridge, the stream enters a small chamber with a large boulder above where the stream exits. The way on is beneath the boulder, but climbing onto the boulder there are unexplored passages to the left and to the right (above the way on).

Crawling beneath the boulder, the passage is stooping height for a few metres before enlarging at a junction. To the right is a climb up to two unexplored passages, while left continues as stooping or walking height, gradually increasing in size until it suddenly emerges into a 10m wide, 6m high passage, Change of Scale .

Upstream

Upstream Change of Scale continues for 100m over a mound of fallen roof slabs which rises to meet the roof. The stream enters from an impenetrable slot on the western side. On the eastern side there is a bolt climb up to a narrow inlet (unexplored).

Change of Scale

Downstream, the passage continues undiminished, passing a large alcove on the left where there is a climb up to another large passage. Some 150m from the junction, a crawling-height inlet enters at ceiling height and shortly thereafter another junction is reached, with a muddy 5m wide fossil passage entering from the left. The fossil passage and the inlet intersect, and the combined passage heads west, initially 5m wide, but soon degenerating to a stoop followed by a climb up into a 4m diameter chamber. In the chamber there is a lead over a wall of infill, but the way on is through a crawl at the bottom which leads to the bottom of an unstable slope up into a larger chamber. Here the stream splits, with most of the water coming from the top of a 5m bolt climb, while the rest emerges from a low wet crawl. The crawl has been pushed to a small chamber with two trickles from impenetrable holes in the ceiling and an even smaller crawl going off. From the junction with the fossil passage, Change of Scale, the main passage and streamway, continues for 40m to Pig Fat chamber containing a large boulder pile.

Soap Dodger Streamway

The less obvious route is ascending the boulders to the left and then dropping down through a archway into the large boulder-strewn Potatoes chamber with the sound of water. The chamber is obviously fault-

controlled, and slickensides are visible on the walls. A bed of purplish rock is visible in many of the boulders in the chamber. From the far end of the chamber a short climb down leads to a small hole rigged with a backup off boulders and a single spit for a 6m hang. This drops into a 6m wide passage with a stream. The passage initially heads just south of east, but soon turns north, another stream entering on the corner and sinking immediately into the Soap Dodger Streamway. The main passage continues to the northwest for 20m to a small boulder chamber where a continuation northeast ends after a further 20m in a faintly draughting choke with passage visible beyond. Back at the start of the Soap Dodger Streamway a three metre climb down gains the floor of a small rift passage which soon lowers to stooping height. After 30m a junction is reached. Left here goes for 15m to a boulder choke, passing an inlet which immediately leads to climbs up to the right. The streamway flows to the right at the junction, almost immediately encountering a second junction where a dry passage to the right leads to an aven and an unpushed dry inlet. The streamway continues to the northeast mostly as low stooping with numerous doglegs. After 70m there is an obscure way on to the right which provides part of the draught Dysentery. The streamway continues beyond the junction with Dysentery, down a 3m climb and further small cascades, before shrinking to become a body-sized Bathtime Crawl with squeezes and a small duck. Beyond it continues strongly draughting with the stream flowing into a series of committing downhill squeezes.

Dysentery

Dysentery Passage is the main way on. It begins as a flat-out gritty crawl to a small chamber. From here small muddy phreas descends to a body-sized mud tube with an awkward bend to the right. The passage continues as a series of dog-legs and short climbs down, with tube-shaped fossils visible in several places. The passage gradually enlarges to a narrow walking/stooping rift before finally rejoining the Soap Dodger Streamway (beyond the ducks) in a 10m-diameter chamber at the bottom of another climb down. The way on from here is a 10m pitch into comfortable-sized canyon passage, The Right Kind of Disco

The Right Kind of Disco

Upstream in The Right Kind of Disco the stream re-enters from an aven. Downstream the 5m wide, 20m wide passage occasionally splits with the water going through stooping-height passage with a dry oxbow to the side. The limestone is blue and white, with several scoured slabs in the streamway. After 100m the passage splits for a final time, with the 4m high stream passage to the left leading to the head of an 8m pitch, Spread Legs, while to the right a muddy, high-ceilinged oxbow provides an unpleasant alternative rig point. Spread Legs lands at a shallow pool which drains over a mud and cobble floor, leading immediately to another pitch. The walls here are coated in thick mud and broad muddy ledges extend over the pitch in an ongoing but slightly reckless traverse level. The 10m shaft is divided by a tall curtain of rock about 2m long that allows a dry descent protected from the water that lands in another shallow pool founded in mud and gravel. 10m ahead a third shaft of about 10m depth is encountered. A broad solid ledge on the right is slippery with thick heavy clay mud. Ahead a narrow rift continues with the floor far below. At the base of the pitch the character of the cave changes again as You Lucky Lucky Bastards is encountered.

You Lucky Lucky Bastards

The base of the pitch into You Lucky Lucky Bastards is again flat floored, muddy and circular. Ahead a narrower passage continues in a tall meandering rift. The walls a slick with aqueous mud and friable plates of choss cut across the passage at various heights. The passage is generally widest closest to stream level and although a few potential fossil traverse levels appear, they all close down rapidly. This continues for about 150m until the solid roof lowers to a couple of metres height. The draft here becomes more noticeable and an unexpected slot in the floor bells out into a 25m shaft. Ahead a traverse continues over the now very narrow slot to a corner a few meters beyond.

Riggwelter

Ahead from the base of On a Promise a steep mud ramp ascends to a window that looks out into the base of another aven. Meanwhile the stream winds around the flat mud floor disappearing down a 2m wide passage in shale which meanders briefly before heading straight. A few pools are crossed and then a short pitch, On A Promise, is reached that overlooks a large 5-10m wide passage, Riggwelter with a larger stream, almost

certainly the main stream first met in Change of Scale . Upstream this has been followed along traverses over several pools to a much deeper pool which requires swimming. Upstream is heading straight towards where the original stream is known to sump. It has been surveyed to the start of the 4m swim. A few metres downstream of the On A Promise a small inlet enters from the top of a 3m climb. Combined tactics required. 15m above the start of the upstream passage a high-level horizontal passage can be seen.

In the downstream direction the passage is 10m+ wide, with a 2-5m water-worn channel between mud-covered ledges. It descends steadily with a series of small cascades/climbs and a waist-deep wade to the head of a short pitch. Here ledge system widens considerably on the right hand side and it is possible to climb up and traverse round to the east where a deep rift (undescended) enters, trending southeast to northwest. Back in the main passage, the short pitch may be bypassed by following the water down a 2m wide, 2 deep hole which is 20m before the pitch. This accesses a lower level of a double-decker passage that is very smooth washed like a water-slide. Shortly after the passages reunite a wet 10m pitch, The Lubricator, drops over chossy rock to land in a spray-lashed pool. Beyond the passage is bisected vertically, with an inaccessible high-level continuation. The way on is with the water through a short crawl, taking the left hand branch to the top of a 220m shaft, The Penetrator. Note there is a solid roof immediately above The Penetrator, so presumably the high-level lead does not connect through.

Blue Balls

From the base of On a Promise, a short climb up to the left leads to horizontal walking passage which is followed shortly by a short pitch down. The pitch may be bypassed by returning to the main Riggwelter streamway and continuing downstream for 50m to a short climb up an inlet. The inlet connects through to the base of the pitch. From here, Blue Balls continues on the same bearing as the original horizontal walking passage. Initially it is a narrow rift a couple of metres high partly blocked by fallen blocks. After about 30m a muddy chamber is reached with evidence of a seasonal water flow. A climb up to a hole reveals a muddy tube continuing straight ahead, but too choked to follow. A second climb up requires bolts and has not been investigated. The final option is a grovel through a dig at floor level. This has been forced into bigger crawling/stooping passage which gradually enlarges until it becomes a 4m wide, 2m high phreas with a mud floor and some nice stal. This passage consistently slopes down at about -10 degrees and follows a fairly reliable bearing close to 345 degrees continuing for about 300m in total. After 100m a small drippy inlet is encountered and the passage briefly closes down before opening out again. A little later a slightly larger inlet enters from the east. It is possible that the left hand roof of the passage here is noticeably higher than the rest of the roof and it may conceal a connection with the nearby Lánmù Shù . After 250m more flowstone is encountered and then the passage begins to shrink to a crawl before a small constriction blocks the way on. The sound of falling water can be heard ahead and the passage has good air.

The blockage has been well hammered to reach a flat out corner followed by a 2m drop. An immature rift beneath a flowstone shell breaks out into a drippy chamber. Following the stream through a short series of low crawls until the floor slopes away into Typhoon pitch in Lánmù Shù.

The Penetrator

The Penetrator is a spectacular 220m shaft with 195m section which could be rigged as a freehang. The long axis of the shaft runs roughly northwest-southeast. At the top, The Penetrator is 10m wide southwest-northeast and no wall can be seen to the northwest. It drops 25m to a ledge on the left hand side (southwest). The stream goes down a gully to the right, so the shaft is best rigged by traversing to the far end of the ledge to avoid most of the spray. Immediately below the ledge the rock is chossy and covered with thick glutinous mud which should be gardened thoroughly before descent. Below this the rock improves and the shaft cuts through thick bedded limestone. Two rebelay immediately below the ledge are followed by a 60m freehang from which a large rock bridge can be seen on the far side of the shaft, which divides The Penetrator from a parallel shafts. The freehang touches down on a large buttress which juts out from the southeast. Water lands on the ledge, most going down a gully to the west. The pitch is rigged down the east side. After some distance the shaft is further divided by a second buttress running northwest-southeast. The rig continues down a 2-4m wide overhung slot between the two buttresses. The base of The Penetrator bells out and has three lobes: the smallest is to the west, while to the south it is 4m wide and ascends steeply over polished boulders, to the north it is 6m diameter and flat-floored.

Big Bang

Downstream of The Penetrator, Big Bang is an extremely high rift 1-3m wide at its base and larger above. The rock of the streamway is sculpted and well polished. The passage continues down in a sporting manner, with a series of traverses, climbs, and wades through pools until a final 2m climb comes to the head of a short pitch Short Strokes. The pitch drops 8m to a 10m section of horizontal passage, followed by a further undescended pitch.

Downstream

Doubling back to the left in Potatoes follow a small inlet up an initially small passage which gradually enlarges. The water comes out of a low grovel which has not been pushed. The passage ends in a slope up to an aven.

Traversing around to the right in Pig Fat follow the streamway down a huge slope of boulders to 10m wide passage which continues for 100m to an area of breakdown. Here a small stream comes out of a passage high on the right hand wall (unexplored) and high on the left there is another unexplored passage (maypole required). The area of breakdown has three distinct streams, one of which is presumably the Change of Scale stream.

The way on is a climb up a mud slope for 2m to a collapsed bedding crawl to the left. After 30m it is flat-out, then pops into a small chamber with another inlet entering from the right; an aven and a mud slope straight ahead; and a hole down to the main stream way on the left. The mud slope bypasses the initial small, scrotty section of the inlet to gain passage which can be followed for 70m to an aven. Dropping into the main streamway, a 10m section of low wet passage reaches a partial choke where a hole up into the choke bypasses 5m of grovelling through boulders in the stream, to reach a slot through into a large continuation.

After 20m of 5m wide bouldery passage the stream disappears down a parallel stooping/crawling height passage on the left which has not been followed for its full length. Where the stream sinks there are two high level passages which require maypoling. The main way on kinks briefly to the right and becomes flat mud floored and 10m wide. After 15m an inlet on the right goes for 60m to a pair of avens, The Stores, where an enormous rat was seen in 2004.

Golden or Green Leaves

Following the main passage for another 15m comes to a choice of three ways on. To the right: Golden or Green Leaves Inlet takes a good draught and goes for 80m of narrow rift passage to a large aven. To the left of centre: an area of gravity-defying breakdown can be followed for 40m to a degenerate crawl. Near the beginning and end of this passage it is possible to climb up to the third and main way on. The third way on begins as a slight ascent into 10m-wide boulder-floored passage where a hole on the left connects back to the streamway. This passage may be followed for 150m gradually reducing in size, and passing a small side passage next to a pool of water after 120m. Beyond the passage is a crawl which turns sharp left before breaking out into a 4m wide mud-floored passage with the stream flowing below the floor. Down a hole to the right a short climb reaches the stream. The streamway goes for 40m in gradually smaller passage, starting spacious and ending with a 1m wide crawl to a sump. To the left before the climb down, 5m wide passage goes for 30m to a junction. On the right the streamway flows in small passage which can be followed both upstream and downstream. To the left a smaller muddy passage goes for 15m to rejoin the aforementioned passage near a pool.

Tackle:

Pitch	Length	Rope	Rigging		
Entrance	5	9	y-hang	2 bolts	
				1 bolt	-2m
The Big Pitch	19	26	y-hang	2 bolts	
			deviation	sling	
			y-hang	2 bolts	-13m
Third Pitch	5	8	traverse	sling, 1 bolt	

			deviation	sling	-0m
Combined Tactics	2	5	sling		
The 260	2.60	7		sling rope protector	
PigFat	6	15		sling around boulder 2 spits	
Disco	10	13	backup	1 spit 1 sling	
Spread Legs	8	11	y-hang	2 spits 1 spit	
Grumble	11	20	traverse y-hang	sling around large boulder 1 spit, sling on nose of rock	
Grunt	12	20	y-hang	2 spits	
Foreplay	24	32	y-hang	2 spits rope protector 1 spit 1 spit	
On a Promise	5	12	traverse	sling around large boulder 1 spit	
The Lubricator	11	20		sling around large boulder rope protector	
The Penetrator	220	255	y-hang traverse	thread, 1 spit rope protector	-0m
				sling	-0m
				1 spit	-1m
				1 spit	-3m
				1 bolt	
			y-hang/traverse	2 bolts	-22m
			y-hang	2 bolts	-22m
				1 bolt	-26m
				1 bolt	-29m
				1 bolt	-90m
				1 bolt	-101m
				1 bolt	-117m
				1 bolt	-130m
				1 bolt	-155m
				1 bolt	-173m
				1 bolt	-195m
Short Strokes	8	12	y-hang	2 spits 1 spit	-3m
Total	348.6	465			

Ø 48H-I12-30: Liù Chǐ Aōkǒu Shàng Dòng

Depth: 265 Length: 1093 Plan: 908

Location: UTM: 0785199 3235228 Altitude: 1265

Head towards Qikeng from Tian Xing. After first shortcut rejoins road, take the immediate uphill continuation of the path. From Liù Chǐ Aōkǒu Xià Dòng head directly uphill towards a col. Shang is on the left hand side of the field at the col.

Description: A 1m diameter hole at the base of a mud wall at the side of a field leads immediately to a short climb down and then slope down through a muddy hole into the cave proper. A drippy 4m aven enters from above and the passage continues upstream and down. Upstream goes for 15m of walking passage to a mud choke with a vocal connection to the surface. On the right a well-decorated tube leads to a small maze of muddy tubes which eventually rejoin the main streamway downstream. Downstream 3-5m high, 4-10m wide easy walking passage with a distinct roof channel and a small stream running down a channel between large mud banks on either side goes for 200m to a choke, passing two high-level oxbows on the left. The way on is follows the stream down a hole on the right which leads to a small chamber and then a strongly draughting 5m flat-out crawl in water and mud. A further 20m of crawling and awkward climbs leads to the head of the first pitch. Traversing over the top of the pitch gains a mud-floored passage which immediately branches. Passage to the right goes to a crawl through very shattered rock and terminates in a choke. The left branch is initially 8m wide, but soon reaches a junction with a large boulder in the middle. To the left a tight rift is blocked by boulders with tree roots. To the right the passage goes for another 25m of easy walking with all ways on terminating in boulder chokes.

The first pitch is rigged with a traverse to a 31m freehang which passes several interesting alcoves/dry inlets. The freehang continues for another few metres to the floor, but the pitch is best rigged by swinging through an eyehole into a smaller muddy parallel rift, rigged with a thread rebelay. After a further 9m the rift rejoins the main shaft beyond a boulder blockage, and a rebelay gains the floor.

From the foot of the first pitch, a short crawl leads to an aven underneath the main pitch. An alternative wriggle leads to a very small unexplored continuation. Meanwhile, a 2-3 metre wide passage descends over breakdown to the SW, enlarging after 30m to a 15m wide chamber with a large aven on the W side. A passage to the S is unexplored, while the main way on descends to the E in 3m wide passage with a floor of breakdown. After 30m, the passage enlarges to 8m wide, before splitting with the small streamway following a 1.5m wide canyon to the right, while the larger route to the left is a dry oxbow which soon rejoins.

Beyond here, the passage swings NE and enters a 30m wide breakdown chamber, with what appears to be a large aven on the S side. In fact, a doorway at the back of this leads to 5-10m wide bouldery ascending passage that has a small inlet. Following this leads to a large calcite ramp above which the passage ends at a calcited boulder choke with a noticeable draught. Back in the main passage the chamber is 40m long, and beyond it the passage returns to a width of 3-5 metres, passing through several areas of collapse until a junction is met after 100m. To the left (W) is unexplored while to the right (E) is a climb down a large boulder pile to a 10m wide chamber from where a climb down to the left enters a crawl in the stream to the head of the 2nd pitch. Straight on from this chamber a short climb up leads to a larger continuation. After 40m a handline climb down reaches a streamway flowing back towards the second pitch. Following this upstream continues on the same trend but the passage soon diminishes in size. Just after an aven on the right the way ahead deteriorates to a crawl that ends at a strongly draughting dig with echoey space beyond. An alternative climb up gains an interesting keyhole passage about 1m across. This has been followed for about 50m or so to a mud blockage with an aven beyond and a rats' nest visible.

From the base of the second passage, the cave continues as narrow rift, descending a further two pitches. The passage is ongoing but narrow.

Tackle:

Pitch	Length	Rope	Rigging	
First	47	65	traverse	thread, 1 bolt, 1 spit
			y-hang	2 spits
				slings -31m
				1 spit -40m
			deviation	1 spit

Second	48	90	traverse y-hang	4 bolts 2 bolts 1 bolt 1 bolt 1 bolt 1 bolt
Third Pitch			traverse	sling 1 bolt 1 bolt
Fourth Pitch			traverse	sling 1 bolt
Total	95	155		

ø 48H-I12-36: Mí Dòng (Lost Cave)

Depth: 261 Length: 1253 Plan: 1121

Warning: This cave responds dramatically to rain. Many climbs in the streamway will become impassable or require rigging with an increase in water levels.

Location: UTM: 0785981 3233924 Altitude: 920

Follow road southeast from Tian Xing. After about 1 km turn left a T-junction 1. Continue straight on, ignoring the road to the left (which leads to Da Xiao Dòng) at 0785500 3234832. When the road ends after about 3km at 0785758 3233864, take the path southeast down to the large Mí Dòng entrance depression at the head of the valley.

Description: The entrance depression drops steeply 110m to a vertical shaft 100m in diameter and 80m deep. Upstream ascends steeply and there appears no obvious way on at floor level. The passage downstream measures 40m high and 15m wide and contains many pools and short climbs. The amount of rigging and float cord required depends on water levels. After 100m a short handline is required to enter a small plunge pool. 50m later another handline is required in higher water. A 30m rope was used to assist for the following cascades as well. 250m from the entrance a rope is required on a 5m pitch. 250m later 3 more pitches are met which drop into a large strongly drafting streamway which eventually requires swimming in wet conditions. In drier conditions walking passage is encountered with the main stream sinking into gravel just beyond an aven after about 300m. A sandy passage continues to a rubbish filled inlet beyond which a gurgling sump is immediately encountered. This might be open in lower water conditions.

Several lakes and waterfalls where slings/float cord are recommended.

Tackle:

Pitch	Length	Rope	Rigging	
Entrance	80	100	y-hang mainhang traverse traverse backup rub point rebelay rebelay rebelay	2 spits tree thru bolt thru bolt spit rope protector thru bolt thru bolt thru bolt
Second climb	2	4		sling knot in crack
Third chute	2	8		jammed block

Fourth	15	20	thread	
Fifth	5	10	backup mainhang	thread thru bolt
Sixth	5	8	anchor	thread (around 3 chockstones)
Seventh	13	20	y-hang rebelay	2 thru bolts thru bolt
Total	122	170		

X 48H-I12-52: Xiè Jiā Wān Dìyī Dòng (Xie Family Bend Cave 1)

Depth: 27 Length: 33 Plan: 8

Location: UTM: 0786417 3234685 Altitude: 1175

Take road from Tian Xing towards Mi Dòng. At Mi Dòng Junction take right fork. Just after the col turn immediately left down a steep path. This soon meets a larger track. Follow this downhill until it contours around to the left and reaches a farm. From the farm take path straight down hill. The path turns left and runs level through woods, emerging at a pair of farmhouses. Skirt round the back of the first farmhouse and turn uphill from the gap between the 2 farmhouses. Entrance is 20-30m away on the edge of a field.

Description: 1.5x3m shaft in crags at the edge of field, just above farmhouses. Descends for 7m at a 60 degree angle before dropping 21m to an uninspiring mud floor. No way on.

X 48H-I12-53: Xiè Jiā Wān Dìèr Dòng (Xie Family Bend Cave 2)

Depth: 21 Length: 24 Plan: 5

Location: UTM: 0786421 3234733 Altitude: 1171

Take road from Tian Xing towards Mi Dòng. At Mi Dòng Junction take right fork. Just after the col turn immediately left down a steep path. This soon meets a larger track. Follow this downhill until it contours around to the left and reaches a farm. From the farm take path straight down hill. The path turns left and runs level through woods, emerging at a pair of farmhouses. Skirt round the back of both farmhouses and take a path going gently uphill. Entrance is 40-50m along, just left of the path.

Description: 3mx6m heavily vegetated shaft. 2m climb down to a ledge, from where a 19m pitch lands on a mud floor in a rift with no way on.

X 48H-I12-94

Location: UTM: 0785681 3235797 Altitude: 1100

In a corn field

Description: 1m diameter shaft, 10 meters deep to mud choke.

X 48H-I12-95

Location: UTM: 0785712 3236041 Altitude: 1071

Description: Small, narrow horizontal passage trending slightly upwards goes for 10 meters, turns right, and terminates after another 10 meters.

Ø 48H-I12-96

Location: UTM: 0784640 3235250 Altitude: 1137

A gully to the right on the path from Qikeng to Dà Kēng.

Description: There are three small entrances the east side of a 4m deep gully. The southern-most leads to a small chamber where over 60 cave crickets were counted. The chamber is mostly full of boulder and mud infill from the gully. From the chamber a bedding where bats roost heads north, with a visual connection to the chamber immediately inside the two northern entrances. Here a 5m climb down into a rift leads to a further short climb which gains a rising (static in dry weather), followed by a climb down past a rat nest to

a pungent puddle. A 3m climb into a high level continuation has not been pushed, but the way on is a duck under flowstone into the bottom of a decorated aven. A sloping climb down over old flowstone leads to a junction with an inlet which has not been pushed. Downstream from the junction the passage shrinks to narrow keyhole for 5m and then gradually enlarges until a 3m climb down which gains a 10m wide chamber. Two inlets enter in the chamber, one comes from the top of a impenetrable boulder choke, but the other flows along a rift to the side of the boulder ruckle and may be passable. The chamber is notable for its sediment bank walls and large sediment column. It appears that it was once much larger, but was filled with sediment which the current stream is now eroding.

Downstream from the chamber the passage returns to 2-1m wide rift. Cairns were seen throughout the cave and beyond the survey limit. Presumably they were left by Dmitry.

Ø 48H-I12-97

Location: UTM: 0785766 3235992 Altitude: 1028

At the base of a cliff in some trees. About 300m away from 'the famous doctor's' farmhouse

Description: Walk in entrance almost immediately degenerates to a low crawl through wriggly mud. There are a couple of small chambers separated by crawls. Not pushed to a definite conclusion. No draught. Smelly.

X 48H-I12-98: Chá Zǐ Tan

Depth: 115 Length: 330 Plan: 249

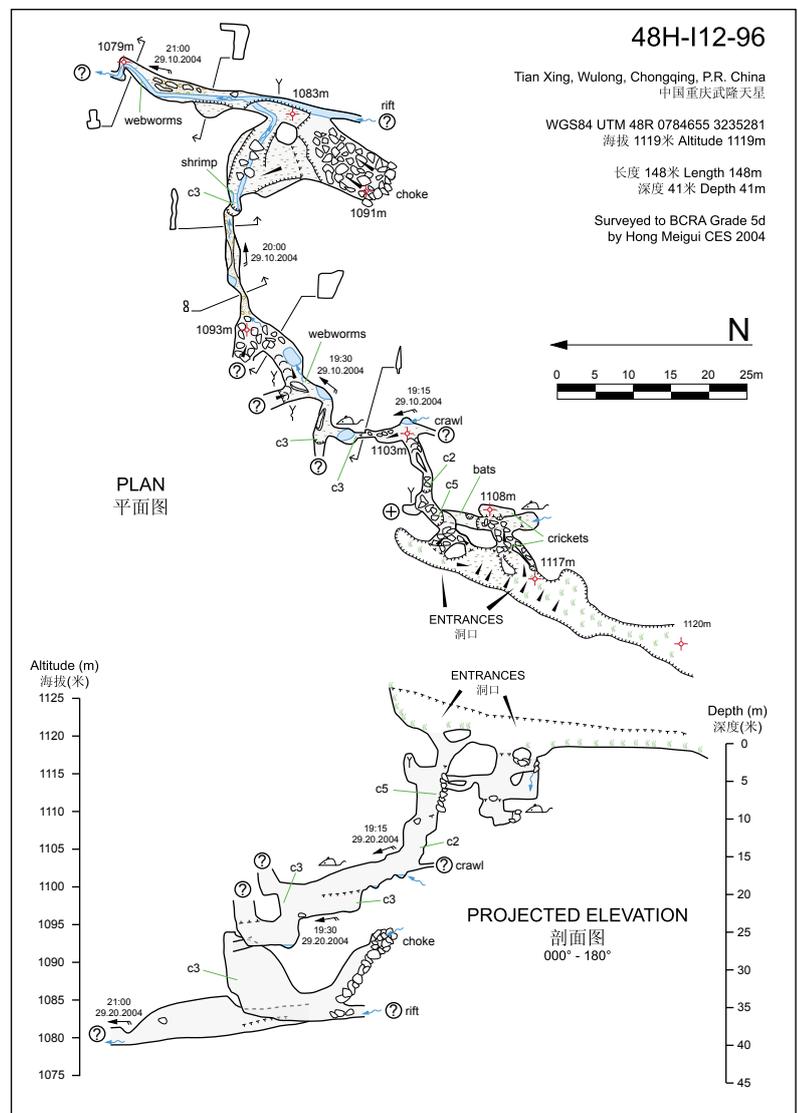
Location: UTM: 0785620 3239316 Altitude: 745

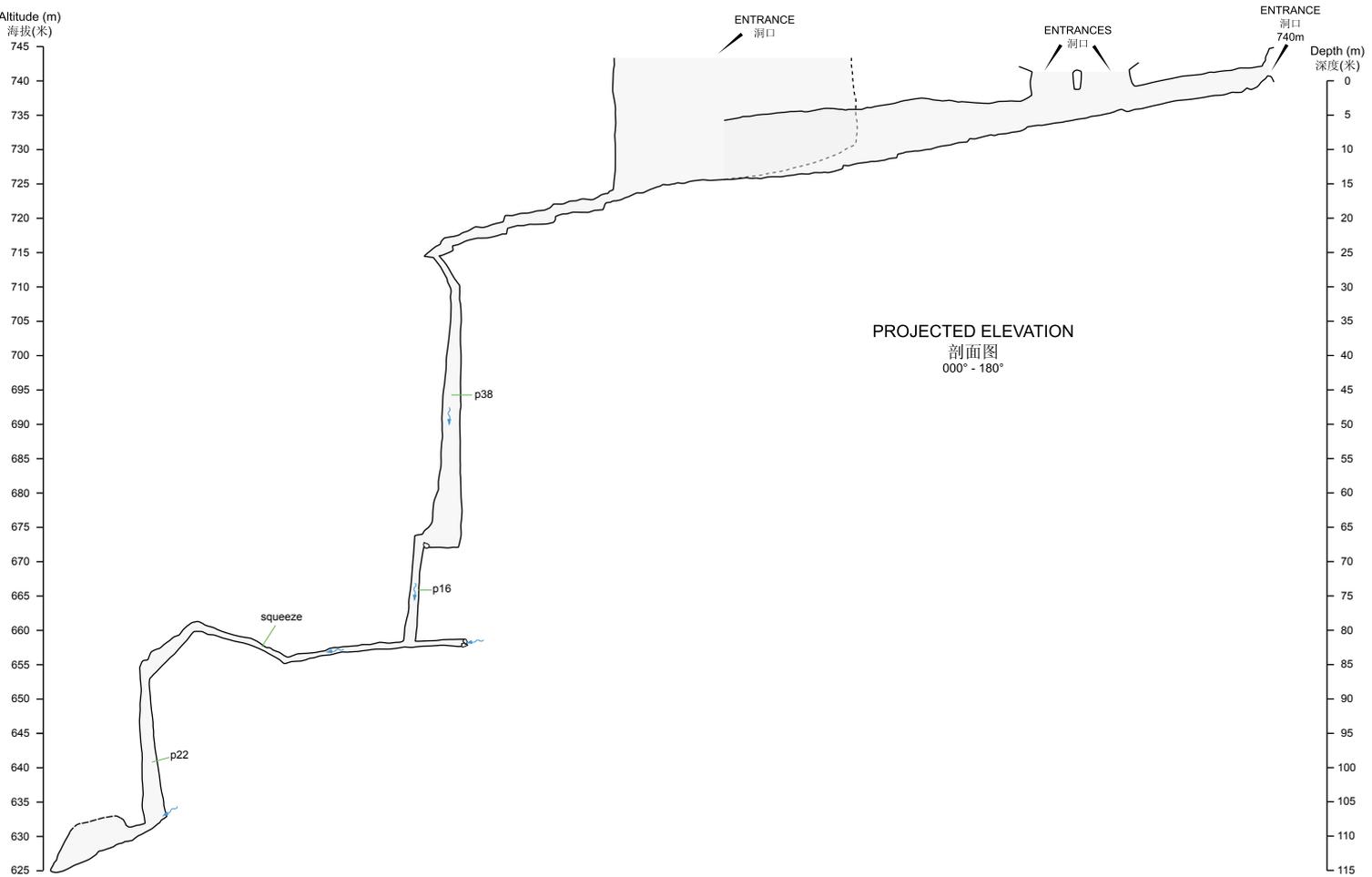
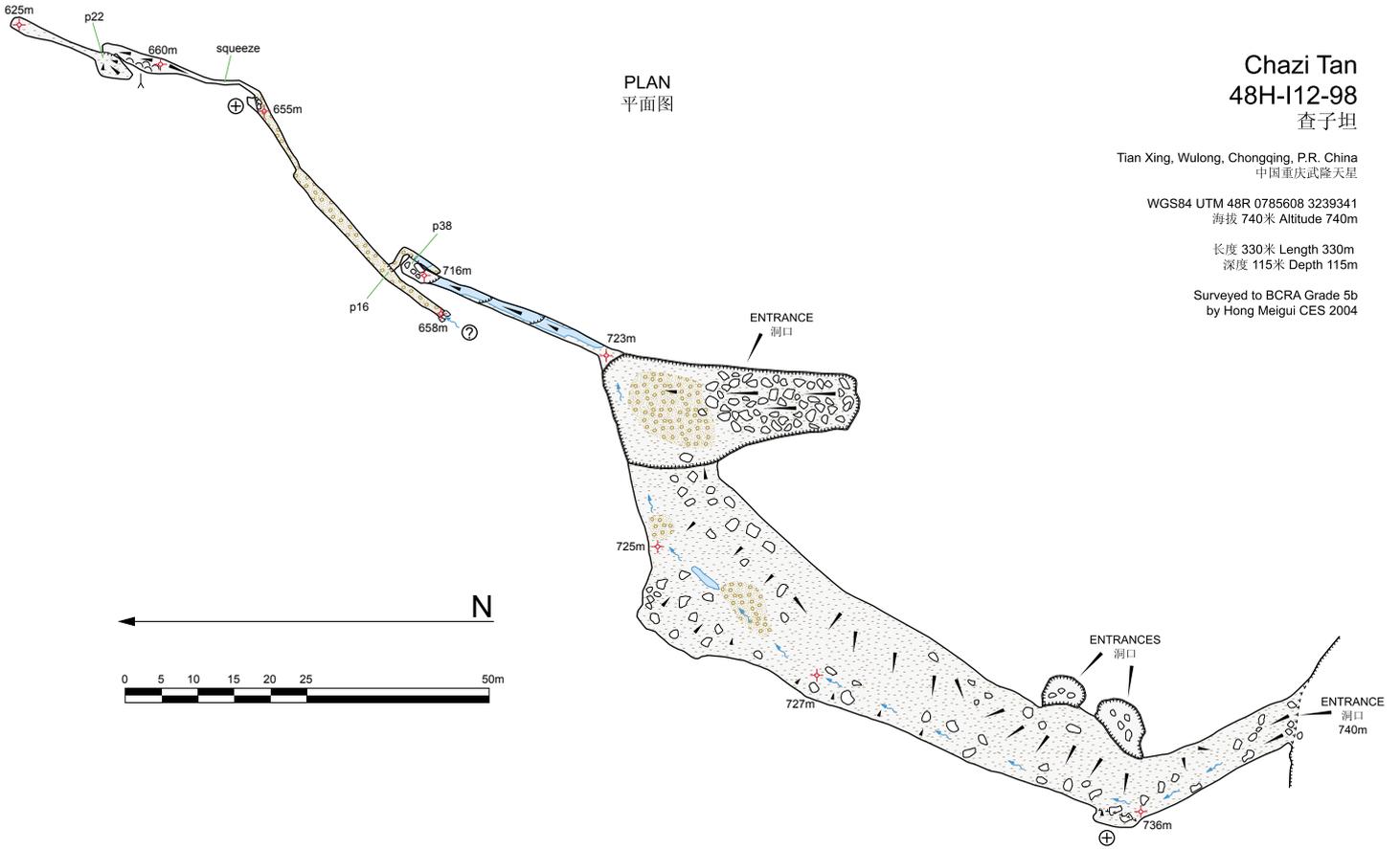
North of end of very large closed depression north of Dan Wan Dong.

Description: Chá Zǐ Tan has an impressive 20m wide walk in entrance visible from some distance, within a large shallow closed depression. Natural drainage from the paddy fields has been channeled to the right of the cave. These fields extend to the cave mouth, supported by a man-made limestone block wall. Immediately obvious at the entrance is a change in the dip of the rock bedding from near horizontal to steeply plunging into the cave. Entry to the cave passage is via a 4m climb down on the right hand side into the cobble and sand floor.

Following the dry stream channel, the cave opens out into a large chamber with a small stream sinking in the boulder strewn floor. The caver passes a talus slope built up on the right as a result of a pitfall trap development. At the end of the chamber is a skylight with steeply ascending slope (est 40 degrees) consisting of loose detritus and fallen blocks. It is possible to scramble up this slope to the surface with care.

In the northern corner, passage continues as walking sized and clean washed with a few easy climbs down, ending in what at first appears as a closed chamber. At the far end of this chamber is a slot looking down onto the first pitch. Rigged easily from an initial free standing Y-hang, the drop descends 40m via a rebelay to a pool and almost immediate second pitch of 15m. This second pitch lands in large horizontal





development which unfortunately closes in one direction after 10m and reduces in size at a mud slope after 30m in the other direction.

Ascending the mud slope leads to a squeeze, then a broad ledge where a rig is prepared for the next pitch. The 25m drop lands in a glutinous mud chamber with no way on.

Tackle:

Pitch	Length	Rope	Rigging	
1	38	50	y-hang	2 thru bolt 1 thru bolt 1 thru bolt
2	16	20	y-hang	2 thru bolts
3	22	30	traverse y-hang	1 thru bolt 2 thru bolts
Total	76	100		

Ø 48H-I12-99: Kēng Dàng Dàng

Depth: 178 Length: 174 Plan: 283

Location: UTM: 0785213 3237503 Altitude: 966

From Tian Xing head north on the road. Take the first turn on the right. Follow the road down until it ends at a Farmhouse. Just past the farmhouse there is a shakehole in bamboo on the right.

Description: The entrance to this cave is in the base of a surface collapse surrounded by a bamboo thicket. A dug out mud choke enables a short squeeze onto a muddy ledge. Immediately, a short pitch (8m) from the muddy ledge drops into large walking passage. Looking back and up, the mud and boulder choke just descended is seen. A small stream runs in the floor which is followed downward to a 2m climb and second pitch. This 20m pitch is in a splendid, approximately 20m diameter shaft, though weak shaley beds make the rigging awkward. An unexplored passage is passed 5m from the bottom. From landing, 10 metres brings the caver to the start of the largest part of the cave. Sequences of pitches follow. Firstly, a sling traverse around a large muddied flowstone leads onto a broad ledge where an inlet enters. Here, a Y-hang and rebelay below the lip drops 15m to another broad ledge made up of dark grey thin limestone beds which have a slate-like appearance. Below this point the rock is fragile making rigging more awkward. A combination of floor and wall bolts, rope protector and rebelay over the edge ensure a good hang. The fragile nature of the rock beds is clearly seen during the 23m drop.

Landing on a wide floor, the passage is of large dimensions. This is the top of a boulder choke, the descent of which is on the right hand side, moving over to the left side half way down. The head of the next pitch is reached (8m, traverse, 15m) which links with a second (25m, 9m), all following the course of the stream. None of the pitches are wet descents.

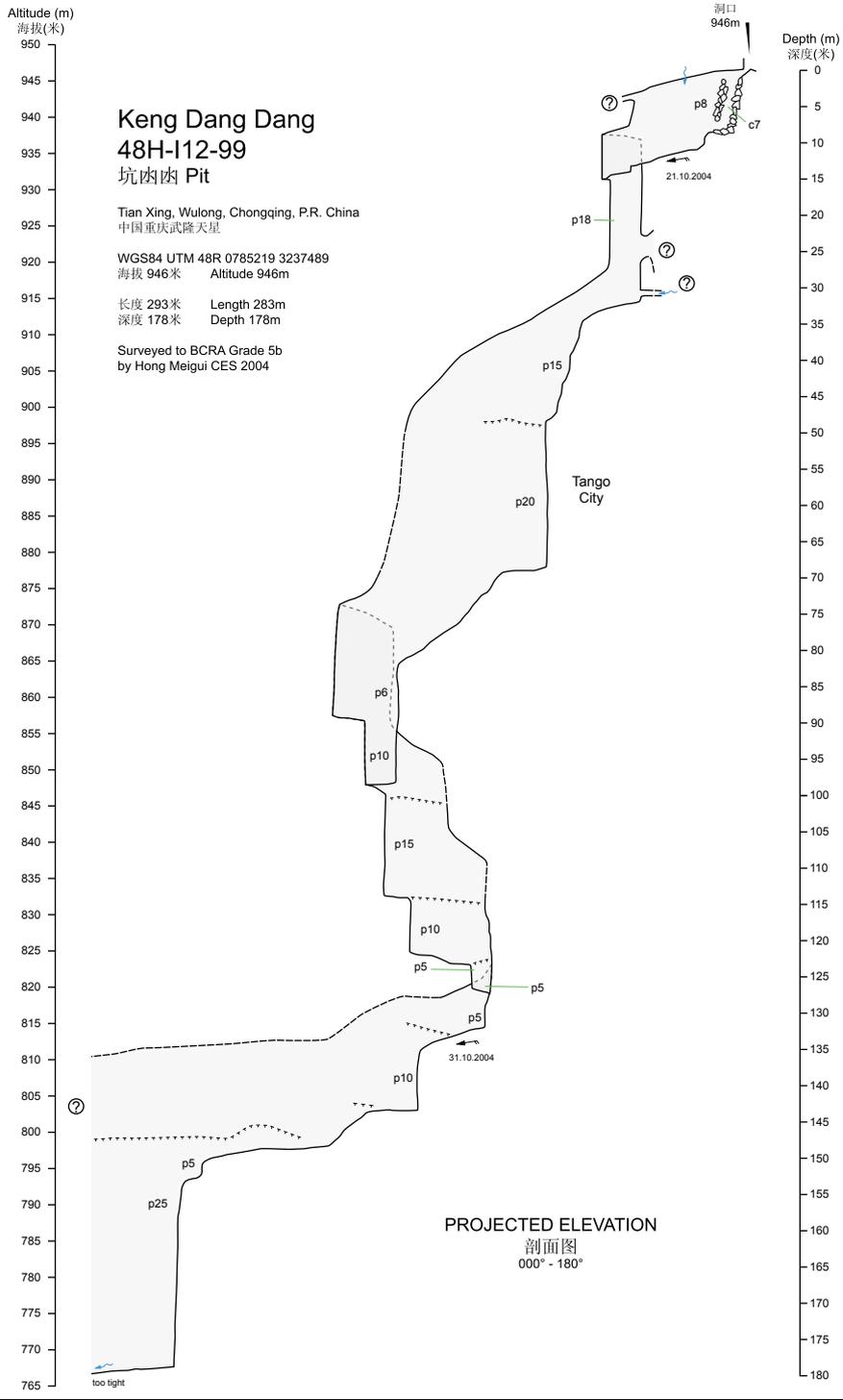
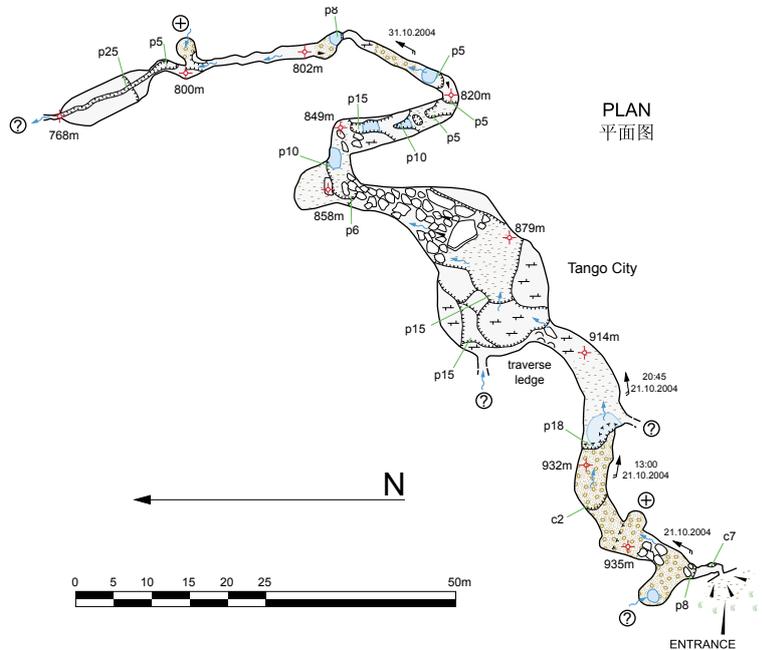
A final short rig (8m) with the aid of a deviation leads to a section of steep cascading passage then another short 8m pitch into a pool. Here is the start of 'crumble crawl' (small deep pool in the floor), a gear snatching 20m passage where help is required to pass tackle bags. At the exit a 3m climb down to the stream is the head of the next pitch. An aven enters on the right. Enter the stream passage at low level to rig a y-hang and deviation to line the rope up with a body sized slot down. Below this the pitch opens out. A second y-hang and rebelay 10m from the floor keeps most of the water off on the 25m descent.

At the bottom, tall large passage reduces to canyon quickly where progress is constricted and difficult. Moving between different levels in the canyon, some crawling is involved - water flow can be seen in the bottom of the canyon but is largely inaccessible. The draught is constant and in-flowing.

The limit of exploration is just beyond an inlet on the right hand side. This inlet leads to a high and dry abandoned watercourse. The cave is generally very muddied throughout.

Tackle:

Pitch	Length	Rope	Rigging	
1	8	15	backup	thread



			y-hang	1 thru bolt and 1 thread	
2	18	25	backup y-hang	1 thru bolt 2 thru bolts	
Tango City 3a	15	40	y-hang traverse y-hang	2 thru bolt thread 2 thru bolts 1 thru bolt (3 maillions)	
Tango City 3b	20	27	y-hang rope protector	2 thru bolt 1 thru bolt	
4	6, 10, 15	35	 traverse	sling around boulder 1 thru bolt 1 sling 1 thru bolt 1 thru bolt	
5	10, 5, 5, 5	44	y-hang y-hang	2 thru bolts 1 thru bolt 1 thru bolt 2 thru bolts 1 thru bolt	-5m -20m -33m -38m
6	8	14	y-hang deviation	2 thru bolts 1 thru bolt	
7	5	10	y-hang	2 thru bolts	
8	25	39	y-hang deviation y-hang	2 thru bolts 1 thru bolt 2 thru bolts 1 thru bolt	
Total	155	249			

O 48H-I12-100

Location: UTM: 0785244 3238436 Altitude: 807

Half an hour's walk north of Ken Dan. Follow the obvious but often dry stream bed.

Description: Narrow slot with a pool of water at the bottom. May be a way on.

O 48H-I12-101

Location: UTM: 0785560 3238411 Altitude: 794

Further down the valley from 48H-I12-100.

Description: Two overgrown 15m+ shafts. Undescended

O 48H-I12-102: Tuō Tián Bà

Location: UTM: 0785846 3238835 Altitude: 828

Half a kilometre north of Dan Wan Dong. Situated at the edge of a flat field on the valley floor.

Description: A 3m triangular hole drops down to walking passage 3m+ wide, 5m high. After 70m it meets a streamway 1.5m wide, 3-4m high.

Ø 48H-I12-103

Location: UTM: 0785531 3235822 Altitude: 1116

Head east along the road from Tian Xing. Take the Mí Dòng road. At the first major valley follow the road until you reach the far side, then follow paths down.

Description: Obscure, overgrown 1m diameter hole down next to a path. At the top one wall is chert, the other limestone. At a depth of 3m the way down is choked with loosely compacted mud and rocks, but continuing passage can be seen through a very narrow slot. It looks as though the walls widen out lower down, and stones rattle for a few metres. It is probably easily dig-able (take two people, digging implement, hammer, and bucket.) Draughts outward on a cool night. Sound of water.

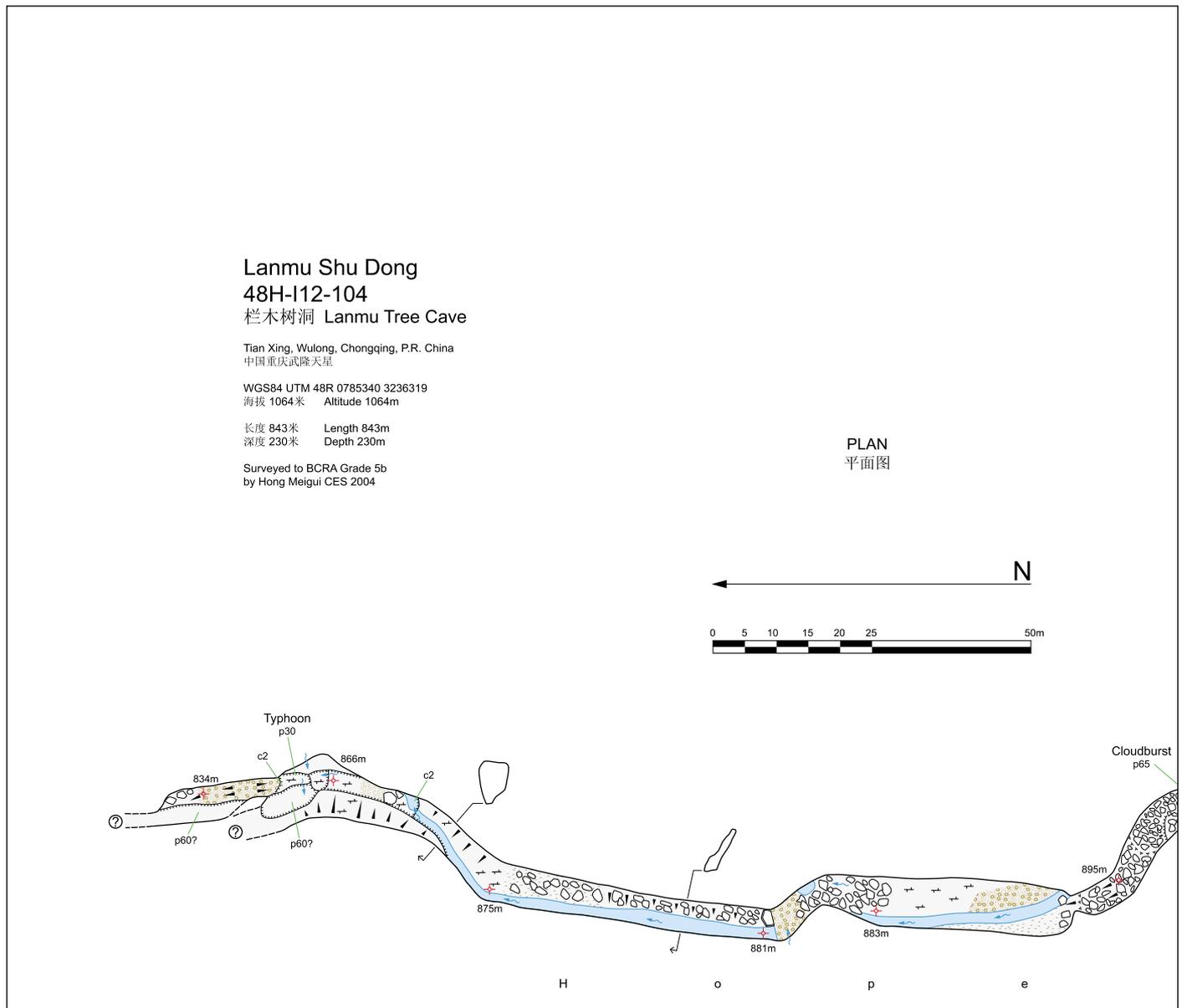
Ø 48H-I12-104: Lánmù Shù Dòng (Lanmu Tree Cave)

Depth: 230 Length: 843 Plan: 693

Location: UTM: 0783517 3236336 Altitude: 1048

Take road east from Tian Xing, but turn left down the first footpath on the left at the edge of the town. Follow this path until a right turn at a large group of tombs. Where this path crosses a small stream, turn left. The sink is in bushes to the left of the path a short way downstream.

Description: Stream sink in bushes next to a path. Clamber down leads immediately to a crawl. From here 30m of hands and needs crawling leads to a short awkward section that originally had to be dug open. The passage now continues sloping down at a steady gradient and bearing for another 100m. For much of this there is a double-decker dry level running overhead although, with the exception of the first such instance, it is generally easier to follow the stream. After 100m a right angled turn to the right leads to some T-shaped



passage and a short lower section before the first pitch is finally reached.

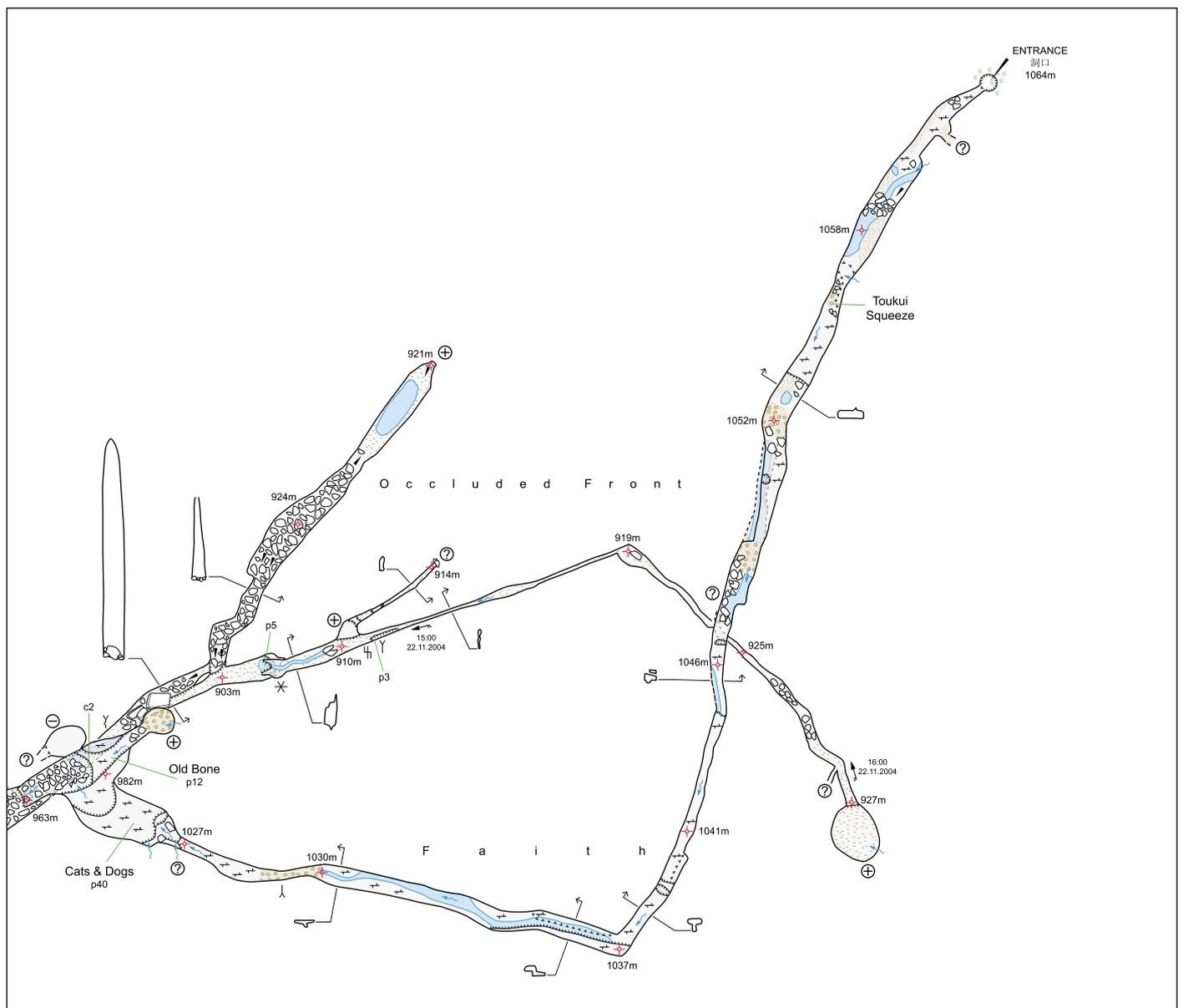
A 10m-wide, 120m deep shaft is broken into three pitches of 42m, 12m, and 60m with large ledges in between. The rock at the top of the first pitch, Cats and Dogs, is loose chert, but the rest is solid, massive limestone. At the top of the second pitch, Old Bone, it appears as if avens enter from the south and east, but they could be collapse features. At the bottom of the second a small inlet enters. The third pitch, Cloud Burst, at various points seems to connect to a parallel shaft. Cloud Burst lands on a drippy slope of boulders and rubble which slopes down to an arch into horizontal passage.

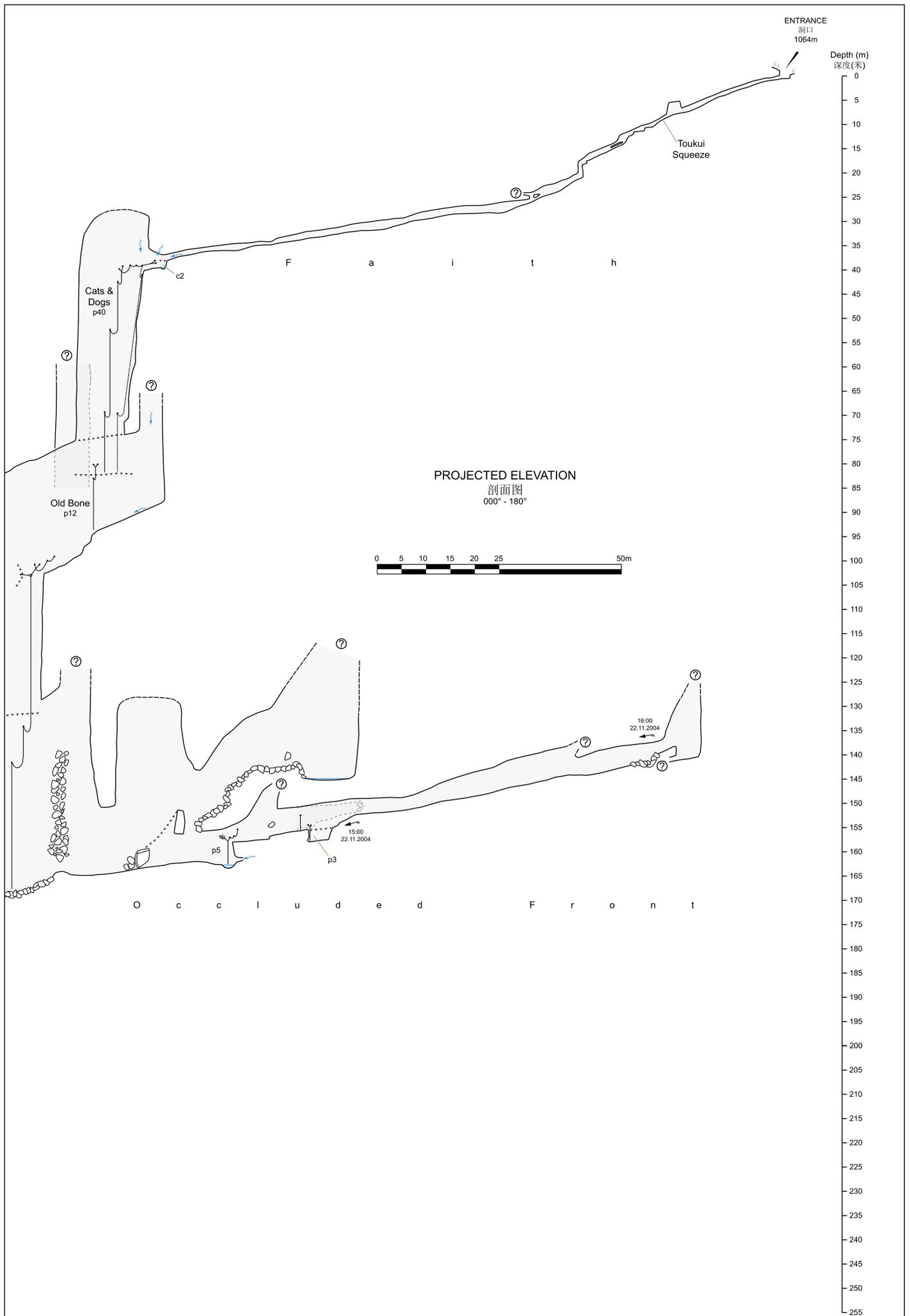
Upstream from the base of Cloud Burst high rift passage with a wet mud floor, Occluded Front reaches a junction after 20m. To the left a series of climbs over rubble end at the base of an aven, while to the right a pitch up leads to a short section of muddy walking passage followed by a further junction. To the left a rift ends at a boulder blockage very near to a connection with Liù Chǐ Aōkǒu Xià Dòng . Straight ahead the main rift continues. At floor level the first is too narrow, and a pitch down is blind, but a rope-ladder assisted climb into roof tube permits progress for 100m of entertaining thrutching which terminates at an aven.

Downstream from the base of Cloud Burst 150m of 4m wide, 4m high, horizontal stream passage in chert/mudstone, Hope, leads to a further pitch: Typhoon which gives 31m of very aqueous descent to the head of yet another pitch.

Tackle:

Pitch	Length	Rope	Rigging		
Cats and Dogs	40	65	y-hang traverse	2 thru bolt 3 thru bolts	-0m





			y-hang	2 thru bolts 1 thru bolt 1 thru bolt 1 thru bolt	
Old Bone	12	20	y-hang	2 thru bolt 1 thru bolt	-2m
Cloudburst	65	75	traverse y-hang deviation	2 thru bolts 2 thru bolt 1 thru bolt 1 thru bolt 1 thru bolt	-0m -0m
Typhoon	30	40	y-hang deviation	2 thru bolts 1 thru bolt 1 thru bolt 1 thru bolt 1 thru bolt	
Total	147	200			

O 48H-I12-105

Location: UTM: 0785281 3238642 Altitude: 822

On path from Tian Xing to Chá Zǐ Tan.

Description: 2-3m diameter 15m shaft. Undescended. Rope needed.

O 48H-I12-106: Gang Dou ? Dòng

Location: UTM: 0785324 3238740 Altitude: 776

Off the path from Tian Xing to Chá Zǐ Tan in a closed depression.

Description: 8m wide, 15m long, 50m deep heavily vegetated shaft. Undescended.

O 48H-I12-107

Location: UTM: 0785288 3238862 Altitude: 768

In the same closed depression as 48H-I12-106.

Description: Sink. No draught.

Ø 48H-I12-109: Bamboo Cave

Depth: 356 Length: 1714 Plan: 1512

Location: UTM: 0785324 3238740 Altitude: 776

Take road north from Tian Xing. Follow muddy road to right. Just past the first farmhouse on right there is an obvious path down on the right. Descend 25m in elevation to a saddle. (To the left from the saddle leads to Chá Zǐ Tan.) Continue uphill. The shaft is to the left in a bamboo thicket.

Description: Bamboo Cave entrance is sited on a fault running north/south. It is an active river cave, going from dry to 'wet sporting' with a couple of days steady rain. The trend of the main route changes several times which is not easily noticed in a twisting streamway - starting north, the west, north again and finally south at the approximately 350m altitude.

Entrance Pitches

The entrance is an impressive, wide shaft surrounded by a bamboo thicket on one side and a mixture of undergrowth on the other sides. A safety line from a tree at the northern end of the shaft provides a safe descent to a bigger tree which overhangs the shaft. The main hang is from this tree. Care is required as debris is easily dislodged.

The 40m daylight pitch lands on a detritus slope, very slippery and steep. The main hang needs to be long

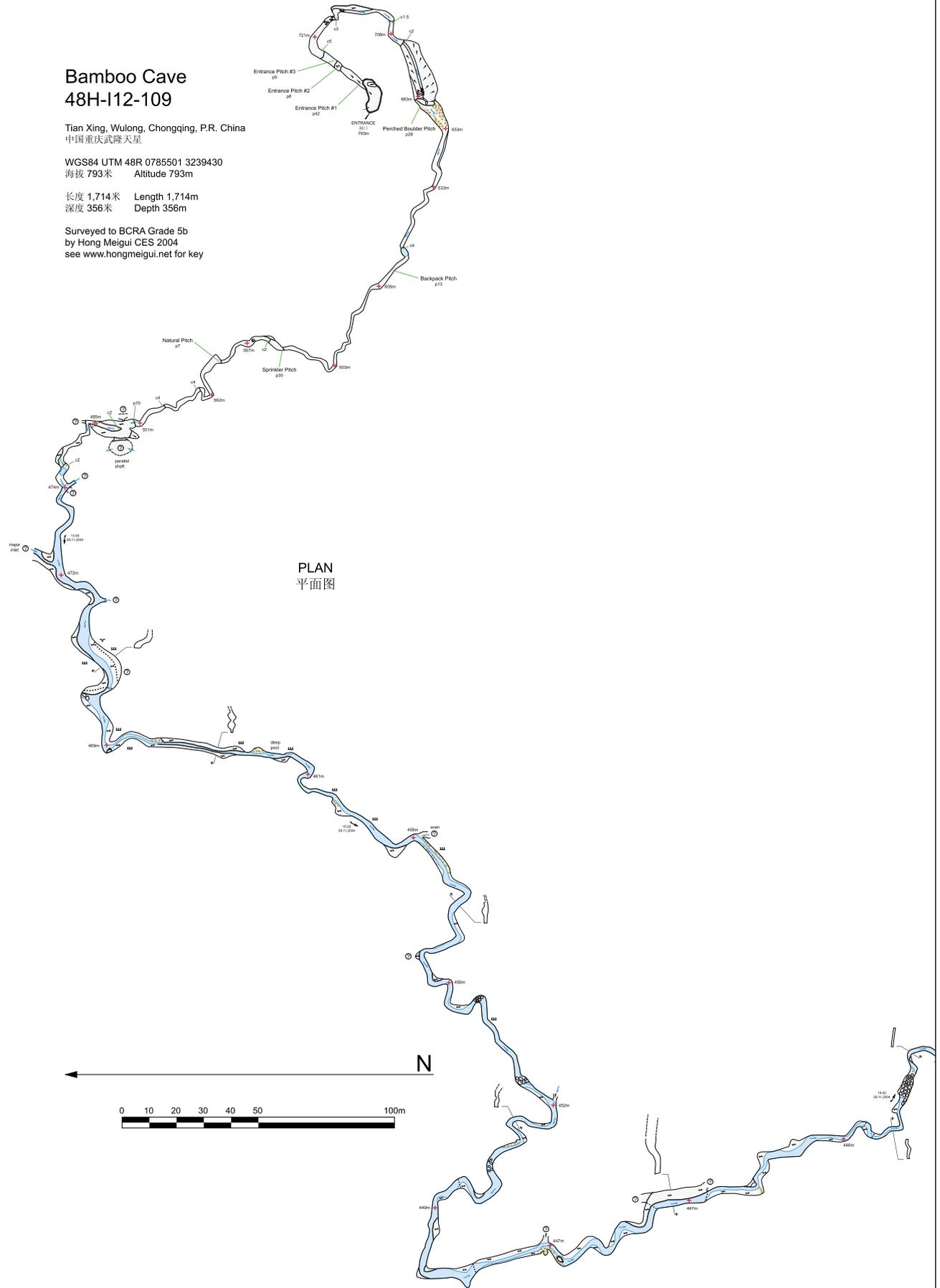
Bamboo Cave 48H-I12-109

Tian Xing, Wulong, Chongqing, P.R. China
中国重庆武隆天星

WGS84 UTM 48R 0785501 3239430
海拔 793米 Altitude 793m

长度 1,714米 Length 1,714m
深度 356米 Depth 356m

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enough to reach all the way down this slope to the head of the next pitch, which is still within daylight but safe of any debris which may fall from the top (an 80m rope will suffice). A level surface provides a safe take off point for this next short rebelayed pitch (10m, 10m). Immediately is a 5m climb down - care: logs and general debris at the head. Trailing a longer rope from the last pitch (+10m) may be a wise precaution.

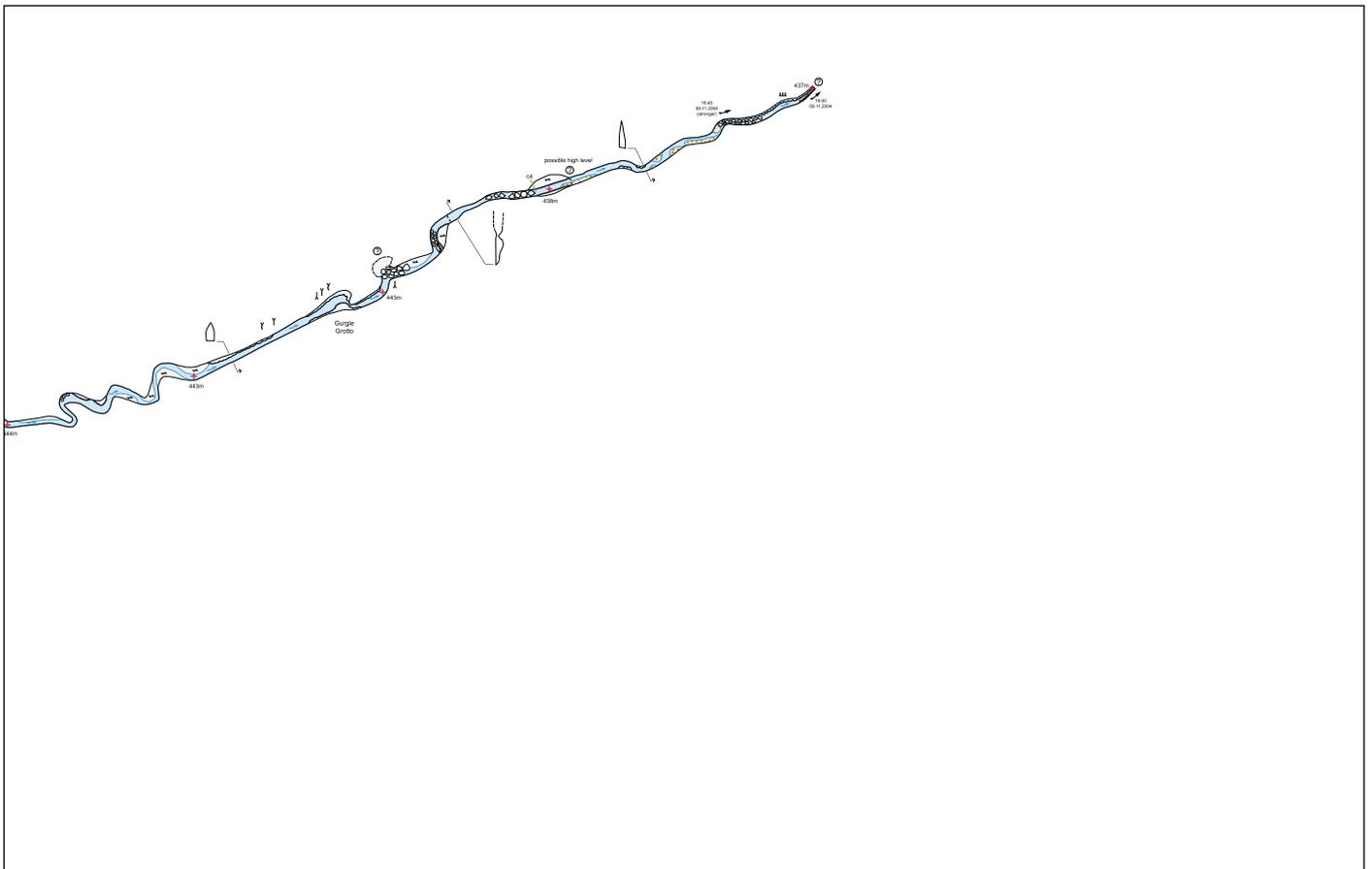
Progressing along steeply descending passage, another climb down (3m) is reached (large muddied nodules protrude from the walls), then a series of easy going cascade style descents to a sloping ledge of clean washed rock in large passage. A narrow gully cuts into the floor. The angle of bedding at this point is noticeably steep, continuing in this style throughout the cave. Ahead, a large wedged boulder marks the start of Perched Boulder Pitch (28m).

After descending the pitch, the stream runs off into steeply descending passage which begins to meander, becoming narrow enough in places to make progression more awkward. Within ten minutes a short climb down of 4m into a pool is followed almost immediately by a short 13m pitch in drippy conditions. Meandering canyon leads to Sprinkler Pitch (30m, also drippy). The canyon continues beyond the drop as the narrowest section of the cave. Quickly, an 7m pitch is reached, followed by more canyon with two 4m climbs to stay with the stream. One is just prior to the head of the next pitch, a splendid 70m drop with several rebelayes to avoid any water, in an ever widening shaft. This shaft has a window into a second, accessed by swinging onto a ledge from the last bolt. A short climb down on the other side of the ledge leads into unexplored canyon passage. Where the water goes or comes from is currently unknown.

Streamway

At the bottom of the hang, following the water down steeply in tight-ish canyon soon opens out into easy walking streamway. Initially, the style is cascades with some pools to wade but eventually this changes to gravel floored passage. A significant inlet comes in from the right, shortly before an area where the passage looks like it may sump. Passing around to the left side, the route opens out again (be aware on return that this place is the only point where the way out is not obvious). Just prior to and at this location, the walls and ceiling are covered in fragile popcorn formations which can be brushed off easily. This popcorn becomes rather common in the cave but not seen at the current active water level.

Two other inlets are passed, along with two boulder chokes (at floor level) before the passage ends at a flowstone constriction. Above the first boulder choke is a large chamber, the access to which is via a



climb up from the streamway starting on the right hand side. The main way on though continues as a 5m crawl in the stream under the choke, opening out into walking passage again. Now less steep, the cave has changed character, as well as direction, to head south. Longer straight sections with flowstone and associated formations make this the best part of the cave trip. Rock structure is rather unique, consisting of a cemented breccia containing a high proportion of white calcite lumps. At one point, a flowstone slot above the streamway (drippy) is passed as an alternative to a crawl in the water. Just beyond this, a trench with a pure white calcite floor runs for 15m before a turn in the passage. The final choke is in flowstone covered blocks where a draught exists but no obvious way on was found.

Tackle:

Pitch	Length	Rope	Rigging	
Entrance Pitches	40	90		1 tree 1 sling around tree
			deviation	1 thru bolt needed
			traverse	1 thru bolt
			y-hang	2 thru bolts
			y-hang	2 thru bolts
Perched Boulder Pitch	28	40	traverse	1 thru bolt
			y-hang	2 thru bolts
Backpack Pitch	13	25	y-hang	2 thru bolts
Sprinkler Pitch	30	40	traverse	1 sling
			traverse	1 thru bolt
			y-hang	2 thru bolts
Natural Pitch	7	12	y-hang	2 slings around naturals
Drafty Pitch	70	75	traverse	1 thru bolt
			y-hang	2 thru bolts
				1 thru bolt
				1 thru bolt
				1 thru bolt
Total	188	282		

O 48H-I12-110

Location: UTM: 0785521 3239529

Take road north from Tian Xing to Qi Shu Cun. Follow muddy road to right. Just past the first farmhouse on right there is an obvious path down on the right. Descend 25m in elevation to a saddle. (To the left is Chá Zǐ Tan.) Continue uphill. The shaft is to the right (north).

Description: 8m wide shaft near cultivated land on one side. Undescended.

X 48H-I12-111: Tóng Luó Jǐng (Copper Gong Well)

Depth: 6 Length: 62 Plan: 62

Location: UTM: 0784761 3236526 Altitude: 1072

From Tian Xing village follow road north for 200m to path descending steeply on the right hand side. Where the path levels off, descend through fields to a bamboo stand. The entrance is through the bamboo, but above the valley floor at the edge of a field.

Description: 5m high, 2m wide walk-in entrance leads down over a slope of mud and medical waste to a chamber with the remains of a concrete wall. The passage briefly narrows, and beyond it is sizeable canyon passage: 3m wide and over 10m high, with a flat floor of wet mud. After 50m the passage abruptly

terminates at a floor-to-ceiling calcite blockage. This cave runs southwest, parallel to Acheron streamway in Qikeng Dong .

O 48H-I12-112

Location: UTM: 0786082 3241103 Altitude: 642

In valley, mid-way between Wenfu and Chá Zǐ Tan. There is probably a track from near the entrance to the road.

Description: 30m long slit in closed valley with dry stream beds at both ends. Needs rope and a slasher. ~30m drop with ledges.

O 48H-I12-113

Location: UTM: 0786070 3241093 Altitude: 642

Dry entrance near 112

Description: 9m high, 10m wide horizontal entrance slopes down to 10m high flat-floored passage which goes for 20m to the north. At the far end there is a climb down. Below water can be seen running south to north in low passage. Rope probably needed beyond.

X 48H-I12-114

Location: UTM: 0785696 3240004 Altitude: 760

In woods near 115.

Description: 4m high, 6m wide horizontal entrance. Choked after 10m. Long abandoned. No draught. No water. No prospects.

O 48H-I12-115

Location: UTM: 0785636 3239952 Altitude: 769

Take the road from Tian Xing to Chá Zǐ Tan. Take the first vehicle track on the left to a farmhouse. The shaft is in a thicket right by the farmhouse.

Description: 15m diameter funnel-shaped shaft with an intermittent small stream sinking in it. All effluent from the nearby farmhouse goes down the cave. Needs a rope.

O 48H-I12-116

Location: UTM: 0785671 3239784 Altitude: 770

On the road from Tian Xing to Chá Zǐ Tan. Take the path on the left just past the orange brick house. The shaft is in a bamboo thicket. A dry stream bed leads to the shaft.

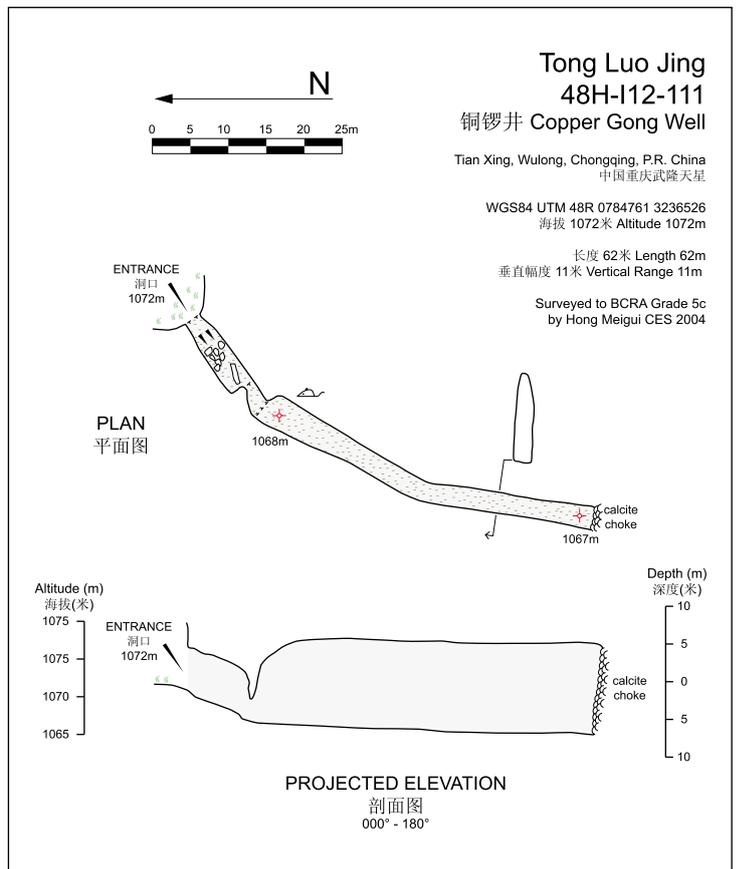
Description: 10m by 8m shaft in a thicket. Stones fall a short way (20m?).

O 48H-I12-117

Location:

In the southern end of the closed valley which contains 112

Description: Wet sink which takes a considerable stream.



6 Personal stories

A lesson in Chinese hospitality, or the perils of prospecting, 5th October

Duncan Collis

Rob and I went armed with a gps to prospect above the end of Liù Chǐ Aōkǒu Xià and on the way back, we were stalked by an aggressive dog until its owner called it off and invited us in. Thinking that we had enough experience of rural Chinese hospitality to get away without having to drink baijiu, we sat down.

After a lengthy rambling chit-chat about this and that, with occasional moments of comprehension, we were ushered into the TV room while a snack was prepared, which of course turned out to be a huge meal.

A bottle or so of baijiu later and our host was calling in reinforcements (including his 12-year old son!) to toast with us. During the course of all this it transpired that he knew of a cave nearby but that we had to play Chinese chess against him first. Losing the first game took longer than expected, because although we had no idea what moves any of the pieces could make, members of the family kept helping us. It then turned out that he wanted to play best of three goes, so we had to lose another one.

Finally we stumbled off to the cave, carrying a huge iron bar picked up by our host. At the cave the bar was left outside and we set off into the cave which soon degenerated into muddy crawls. No draught, so we weren't too disappointed when our guide suddenly started to reverse, saying something about "four years and four months," and we grovelled out to daylight, where Rob was treated to a bout of kung-fu fighting before we picked up the iron bar and walked unsteadily back to the farmhouse, where they showed us the path back to Tian Xing.

Dà Kēng: first camp, 8th – 11th October

Brian Judd and Vladimir Yurkuns

During the Tian Xing 2003 expedition we left a passage beyond the Ferryman passage unexplored. It was a wide lead without any obvious obstacles and had a strong draught. We'd left it ongoing because we were out of both time and rope. This year we had a strong team willing to push the cave in this direction, as well as to do some filming.

8th October

We readied our equipment before lunch on Friday and started to Dà Kēng at around 16.30. Each of us had two tackle bags, one with personal camping gear and one with the other stuff we needed to complete our mission.

Peter wanted to film our descent to the entrance of the huge shaft of Dà Kēng, but unfortunately there was not enough light, as the sky was getting dark. When we arrived at the bottom, we found that last year's campsite was in very good condition. That evening we organized the underground camp and rigged the last pitch before the horizontal part of the cave.

9th October

The underground camp was so comfortable that we did not want to get up and started late.

We crossed the cave towards Horse Head Junction, passed Ferryman Passage and found the last survey station of the previous year - it was No. 300. Brian and Vladimir started surveying the new part of the cave, while Peter and Dmitry grabbed the ropes and video stuff and went down ahead of to rig the new pitches if necessary and to do some filming.

The cave went very well. Dmitry and Peter rigged down a couple of 9m pitches over flowstone dropping to a T-junction. South was explored in narrow passage for about 40m ending in a couple of sumps. North was surveyed along an angled rift to a 2m climb and two small pitches. Traverses and a short crawl in dry passage studded with popcorn formations and stalagmites eventually joined a small stream and then a much larger one. Here the cave became sportingly wet, with wading through pools, cascades, and traverses over

water. Only short survey legs were possible as the noise of the water was too loud to hear the compass and clino readings shouted to the man writing them. A 25m pitch was followed by a 25m climb with the water racing down the rift next to the climbers. After this the passage evened out and the swims began. The hour was getting late and the clino was impossible to read because of the damp so we returned to camp having surveyed about 500m of passage and knowing that it was going on. A heavy meal and so to bed.

10th October

This time Peter and Dmitry surveyed while Brian and Vladimir took photos and explored what the other two had seen the day before. After the swims the passage enlarged to 10m wide and then split. One branch of walking passage led to a pitch dropping into a lake. The left branch took us in walking passage back to the streamway, with more traversing over deep sections and swims. Again time ran out before the cave could be completed and this lead was left at a 3m climb for which a rope is needed.

11th October

Had breakfast then set out to climb out.

Liù Chǐ Aōkǒu Xià Dòng: the cave that wouldn't die, 10th October

Rob Garrett

Once again it fell to Duncan and myself to venture back down Liù Chǐ Aōkǒu Xià, a veritable speleo-Lazarus having come back from the dead at the 11th hour on our previous trip. Strictly speaking of course it was really just well into the 9th hour. Anyway, the entrance series passed steadily. On our previous trips down we'd noticed how the nature of the pitches rendered cows' tails irrelevant so on this occasion to save weight, and limit the opportunities for gear to catch on the capricious entrance rift, we left them on the surface.

Knowing our new lead was a short pitch we came armed with a hand bolting kit, three bolts and maillons, a sling and 20m of rope. Once into the bigger passage progress was easy and in no time we were staring down into the unknown. I set a backup around one of the many boulders whilst Duncan prepared to place a bolt at the head of the pitch. Half an hour later we were all set to start surveying.

At the base of the 6m pitch we encountered a small stream in a comfortable passage 3m wide and 6m high. Initially it was heading back towards known cave but after only 20m it made a tight dogleg and set out promisingly into black space. A noticeable draught lured us on and things were looking good. Two long survey legs later and the passage crapped out at a boulder choked aven. An unpromising passage now took our attention and, on closer inspection, proved to be better than it first appeared.

Two survey legs later, our new lead crapped out too. A mud and boulder choke offered two teasing views through to larger space beyond and a faint draught but neither was large enough to pass without digging.

That appeared to be that. While I went for a futile furl in amongst the large boulders that piled high into the aven, Duncan backtracked to see if there was any hope at the place where we lost our initial stream amongst boulders. Miraculously there was hope - a rather immature passage trundled off to the side down a short climb. We followed the latter surveying as we went. Progress was inescapably slow as the passage twisted and turned like a dog with multiple leg fractures. Moreover the passage was seldom more than 1m high and wide. The final complication was given by the polished floor which seemed to be a variety of mudstone but with all the frictional qualities of a bar of soap. Nevertheless, a cool wind in our faces beckoned us ever deeper.

Soap Dodgers' streamway as it came to be known carried on for about 200m without encountering anything more interesting than the occasional small inlet passage. How long could this continue without breaking out into something more significant, the source of the draught? Time was passing and it was nearly 18.00, our provisional turn around time, and we were keen to leave the cave at a more enticing location.

Unexpectedly the passage began to get even smaller. It was my turn to leapfrog ahead trailing the tape measure behind. Until this point we'd been able to stay dry but now the way would involve lying on my side in three inches of water. I could see a hairpin bend ahead but wasn't enthusiastic about getting wet. The draught was noticeably stronger in the constriction and I eventually decided, with a little encouragement

from Duncan, to look around the corner and review our options.

The leftward corner, I could see once I had advanced so that I was lying on my side looking around it, was about 1m wide and very low with a cobble floor. Ahead was more brown water and a sharp corner to the right. We deliberated. Then we vacillated. Finally I decided that since I was already a bit wet I'd carry on without any intention of surveying to see if it opened out again.

Where I was lying was very narrow and the corner was very sharp but there was just enough room to twist onto my belly and persuade my legs to follow me round the corner. I dug a few pebbles out and pushed them aside as I went. At the lowest point my helmet flattened sideways to gently press my temples, before squeezing through. This was good as it meant the rest of my body should not be too fat to follow.

The right hand corner was narrower again and with about 3 inches of water hidden from sight. Once again my legs followed without too much difficulty. Now both sides were wet but I could see a little way ahead.

"Does it get any better?" called Duncan.

"Yes," I replied, "in a Dave Lacey sort of way."

"You mean the water gets deeper?" said Duncan.

"Aye!"

Ahead I could see the passage was wider again but I could also see the roof came lower, before rising slightly. The water did indeed get deeper otherwise the squeeze ahead might have been impossible. Properly committed now (I didn't fancy the prospect of reversing the previous squeeze and corners feet first) I pressed on exploring avidly hoping to encounter somewhere large enough to turn round. I've been in such places before and on one occasion, when I'd been following the aforementioned skinny Mr Lacey, it had taken quite some time to execute a feet first reversal. Nevertheless, things weren't that bad yet and there was a good strong draught of fresh air in my face.

I crawled into the water with one ear and cheek forced below the surface, head tilted to keep my mouth in the airspace and exited the duck via a flat and muddy squeeze. Ahead was the sound of small cascades. All I need was larger passage and I could call Duncan to follow but not yet. Several metres ahead the low passage had a barrier across the middle leaving an upper and lower hole. The upper looked small but passable as a squeeze. However, the closer I got the smaller it seemed. It began to look desperate but the streamway was just carved out of chert and mudstone and so an idea formed. Maybe I could shift it with my bare hands, nothing else being available. It wasn't light but I had to attack it at arms' reach due to the constricted nature of the passage I was still in. To my relief it pushed upwards surprisingly easily and I was able to wrestle the chunk of rock ahead of me for a few metres until the passage enlarged slightly.

Now I could turn round I felt much happier and even contemplated summoning Duncan, but the passage ahead was still small. I made a further foray into the unknown as the stream dropped noisily down tiny cascades ahead. I could see another chert constriction and began to conclude that if this were to be China's first 1km deep cave then I didn't much want to be a part of the team ferrying hundreds of metres of rope, rigging and camping gear down there. With the wind in my face I backed painfully to the turning place and began to head out.

Even now all was not trivial. I didn't know if the asymmetries of direction might prevent me escaping the tight corner head first and the squeeze/duck tended to force my head deeper into the water in this direction but in the event I escaped and we began to head out. Once again the cave appeared to have had the last word.

A few half-hearted attempts were made to check out the inlets lest they should provide a way on. One in particular, a flat out sandy gravel heading up above the streamway seemed to have a draught and after only a few metres Duncan was surprised to find a watershed - another way on down through small phreatic tubes but once again with an unmistakable draught in his face. Lazarus had done it again, we would have to return...

Lánmù Shù Dòng: through the first squeeze 23rd October

Duncan Collis

Rob, Erin and I set off on an evening trip to check out Lánmù Shù Dong, interestingly located sink.

I went ahead with a very heavy bag containing drill and rigging kit in order to start rigging the pitches we hoped would drop us into the far end of Liù Chǐ Aōkǒu Xià.

The cave starts as a hands and knees crawl and the heavy bag was a total sod to move along it. After 40m there was a low, wet gravel to a boulder blockage, so I dropped the bag and removed my SRT kit and wriggled to have a look.

There was a space through the wedged rocks, but it was only just big enough to poke my helmet through held in my hand. A bit of rock-jiggling loosened a couple of stones and opened things up a bit, but nothing else seemed to move at all and the hole was still too small. One of the rocks I'd moved had fallen forwards and was blocking the view onwards, so I reached through to shift it. My arm wasn't quite long enough, so I shoved my hat through and pushed the rock with it. The rock shifted suddenly, and I lost my grip on my helmet, which skidded away out of reach about five feet away.

This gave me considerable further incentive to try harder to dig away at the blockage, and I eventually managed to squeeze through, scraping my chest as I went. On the other side it was easy to open the hole up a bit more.

I didn't fancy going back through for the bag and my string kit, so I decided to give myself a time limit of 10 minutes and see what was ahead...

Turns out to be plenty more hands and knees crawling with bits of stooping, no sign of any pitches. I built a small cairn at my limit and returned to the squeeze and waited a short while for Rob and Erin to arrive with the survey. Surveying as a threesome went a couple of legs beyond my previous limit and then had to turn around - we were already going to be late for dinner.

However, from my final station, I thought I could hear water falling not far ahead, and was sent onwards to check it out - sure enough, the passage broke out into a 10m wide space with a pitch of perhaps 35 or 40 metres. It goes!

Dà Kēng: second camp, 23rd – 26th October

Brian Judd and Oliver Trueb

...The passage widened, sandy floor, formations, the works. We paused for a moment at a junction and marvelled at the stones and shapes that appeared in our powerful LED beams. Now a decision was to be made. Should we head to the Lake Section or should we continue to follow the canyon with its aquatic horrors? We decided to take our chances with the lake. Somehow it sounded more placid than the canyon.

It seemed only fair the Oliver should rig into the unknown and he tied the rope to a large column, put a rope protector on and descended towards the lake. He found it was possible to traverse around the edge and landed in a beautifully cobble floored passage. The surveyed legs were all nearly 40m or over but it was too good to last and it ended in a sump after a disappointing 200m. Dave tried climbing in the roof to no avail. There was nothing for it but to go to the wet canyon. There was a brief respite as we travelled along a well decorated passage above the streamway but then we had to drop down to the water.

We continued downstream towards the unexplored passages. After more fun filled and action-packed moments in 'waterworld' we reached the point where the previous team had called it quits. Elated by having reached this point in the first place we shipped out the survey gear, rigged the drop that stopped the others and got down to business.

Men were men or something like that. When the going gets tough, the tough getting going etc. etc. but it was bloody cold. The cave was unrelentingly wet. More swimming, a brief interlude, shivering, swimming, a major inlet with one aven. This brought more of a draught, more swimming. Shivering. Getting late. The early hours. At last we realised we weren't men or tough, we were mice and it was time to run out of this passage, the 'Topless Meander' ending at 'Stiff Nipple Lake'. It was a swim too far in furry suits. Probably we were near dam level and the cave would sump soon anyway.

Five hours later we were back at camp after a couple of life saving stops where we used the stove to brew up soup, porridge and glucose drinks. A big feed and so to bed.

Liù Chǐ Aōkǒu Xià Dòng: rigging the big one, 3rd November

Duncan Collis

At quarter to mid-day we went underground, each with a fairly full tacklesack, between us carrying 190m of rope, a drill and two 1.3Ah batteries, 20 hangers, maillons and thru bolts, a gas stove, a pan and some dehydrated meals. This slowed us down a bit in the entrance passage and in Dysentery, but we got to the top of the big pitch, The Penetrator, in just over four hours nonetheless.

Rob and Erin then backtracked to go and survey an interesting rift I'd found that points towards Lánmù Shù Dòng, leaving me to repack the rope and rigging kit before setting off down The Penetrator.

Eventually, with everything packed into two sacks, and the drill and hangers hanging from my harness, I set off. The top 20m of the pitch, which I'd previously descended to a big ledge, was a bit wet, so I put in an extra rebelay to get a bit further out. Still a bit splashy, but an improvement.

Once on the big ledge, I dropped the bags and had a clamber round to decide where to rig from. As I'd suspected, the best bet appeared to be a climb up into a crow's nest platform at the end of the ledge. From here I'd be descending well away from the water, and the rock looked good. Not being a lover of big, airy free-hangs, I was a bit concerned to find that stones thrown from my ledge fell a long way...

Throw: onethousandandtwoousandthreethousandfourthousandfivethousandsexthousand
BOOOOOOOOOM!

Lowering the first 70m of rope over the edge it was clear that the wall was gently but determinedly overhanging -- the rope disappeared off into the blackness of the middle of the huge shaft. The far wall was about 15m away, and no walls could be seen to left or right.

After taking a few minutes to compose myself, I set off over the edge. Two rebelay were required a short way below the lip, and then I could no longer reach the wall, and was wondering quite how far it would be before I next encountered something to rig off. As the first rope ran out though, a huge buttress rose up out of the mists beneath me and I was able to join on the next rope at a rebelay at the top of the buttress with just enough slack in the first rope for me to get my stop off.

Below this point, the pitch became much friendlier. I still had a huge black void behind me, but in front of me was a nice wall that I could look at to take my mind off how far off the deck I was. In fact I was enjoying myself immensely, keeping an eye on where the water was falling and swinging around to choose the line of the next hang. A couple more rebelay down and another huge buttress appeared, and I chose to drop down the gap between the two walls. Here I joined my final long rope, a 56m length, and still couldn't see the floor. After I'd descended further and put in 3 more rebelay, I could see a sheen of water below me reflecting my light back up, a floor, or at least a big ledge that would allow me to get off the rope. However, soon I realised that the end of my rope was swinging 8m off the floor. Luckily, when I'd been repacking, I'd chopped 20m of unused rope from the bottom of The Lubricator, the splashy little pitch before The Penetrator, and this got me to the floor, where I touched down at just before 20.00. I bagged the drill up and stashed it in an alcove, and then went for a look around.

The bottom of the pitch is a huge, multi-lobed shaft bottom, with a few small inlets coming in as well as the Liù Chǐ Aōkǒu water, and it all combines to flow away down a tall rift passage. Climbing and traversing I set off downstream for a quick look, and turned around after about 80m at a pool which might or might not have been deep. Expecting Rob and Erin to turn up soon (we'd agreed that they'd aim to set off down the pitch at 20.00), I went and joined the drill in its sheltered alcove, sitting on an empty tacklesack and using the drill's dry bag, inflated, as a pillow, and wishing I hadn't left my flapjack and condensed milk at the top of the pitch.

I waited.

I waited some more.

At twenty past ten, I heard Erin shouting something a long way above me. Thinking they were finally on their way, I shouted 'Pitch Free!' and promptly fell asleep for an hour. When I woke again at 23.20, I was shivering uncontrollably and there were no sounds of people surveying down the pitch above me, so I packed up all the rigging kit and the drill and set off prusiking. At the third rebelay the strap broke on my Pantin foot jammer, by the fourth rebelay I stopped shivering and at the fifth rebelay I found that my watch had fallen off my wrist since the third rebelay. Oh well.

As I climbed the big freehang, Rob shouted from above, and on hearing me answer shouted that he'd get the stove on. Twenty minutes later I was eating partially rehydrated paella from a foil packet without a spoon and finding out that Rob and Erin's passage had gone for over 300m, was reasonably wide in places, quite pretty and finally ended at a too-tight squeeze with open space and the sound of falling water beyond. Sure that they were only metres short of a connection to Lánmù Shù Dòng and a much easier route out, they spent ages trying to hammer the squeeze with a rock, but eventually gave up.

We hit the surface at ten to six in the morning after an 18 hour trip.

Liù Chǐ Aōkǒu Xià Dòng; the final push, 15th-16th November

Erin Lynch

We'd put the inevitable off for long enough – it was time to derig Liù Chǐ Aōkǒu Xià. Armed with camera and survey kit we made rapid progress into the cave, arriving at the top of The Lubricator at 14.35, three hours after leaving the surface. It was much wetter than usual thanks to a week of rain. Although we managed to stay dry-ish through Dysentery and most of the rest of the night on two kilometres to The Penetrator the final 100m did us in, with a final insult from the cave in the form of a waist deep wade followed by a very aqueous abseil down The Lubricator, leaving us soaked from head to foot as we set off down The Penetrator

We quickly reached the ledge 25m down and started surveying the new stuff. The plan was for me to go first, Duncan to follow with instruments, and Rob to go last with the book. I gardened what seemed like a ton of mud and choss off the top two rebelay, then did a long slow abseil down the 60m hang, admiring the shaft as I went. It was big, with blackness stretching off to the north, while to the east the wall was at least 10m away, and sometimes much further as it connected through to a parallel shaft. I descended past a rock bridge that separates the two shafts and soon came to a ledge which split the main shaft in two, most of the water going down a gully to the east while the rig thankfully went to the west. Sitting below the belay I waited for the survey to reach me, but instead of numbers I heard a garbled "Come... Back... Up...". My first thought was surely they must not mean me – it was bloody 60m to the top of the hang! But it all too soon became clear that Duncan wasn't coming down. I had no choice but to go up, lugging the tacklesack full of bolting, cooking, and camera kit, and muttering under my breath that there better be some broken survey instruments or a popped bolt when I reached the top. I arrived at the belay to find Duncan with his legs going numb as he held a breeze-block sized lump of rock into the wall. Some rather dramatic gardening ensued, with thunderous bangs as the rocks lost quite a lot of potential energy. As the survey continued, I was actually quite glad of my extra exercise, as below the big hang the rigging, dry a week before, was engulfed in a light but constant cold rain from above. By the time we reached the bottom at 17.30 we were chilled to the bone, so we crowded under a rock for some pasta and sauce.

The bottom of the shaft was complex, with several lobes and spray everywhere. Downstream the gently dipping 0.5m thick beds of white and grey limestone continued. The passage was classic Tian Xing – 1m to 3m wide canyon that went up, up, up, with polished, sculpted smooth rock, pools, and climbs. We were scoured clean in no time. Previously exploration had stopped at a pool, which was easily skirted. This was followed by another pool and then, unsurprisingly, a pitch. It was still early, so Duncan ran back to chop the tail off The Penetrator rope, while Rob and I attempted to photograph the Big Bang Streamway. A flashgun that wouldn't charge, a firefly with flat batteries, and a camera that wouldn't open all conspired against us, so Dunks had placed 3 bolts before we'd finished. Short Strokes was reminiscent of many of the Qikeng streamway pitches, with water cascading from the lip onto a ledge 3m below, and then down the short pitch. From the bottom, two legs saw us to the top of another pitch. Out of rope, we peered into blackness. About 10m below we could make out a ledge of white limestone, and below that another ledge. Beyond.... who knows. We couldn't hear rocks hit the bottom. It looks a LONG way down. Well satisfied that we'd pushed the cave to the limit of our rope, we turned around and were back at the base of the pitch, starting up by 22.30.

I prusiked slowly up The Penetrator with the tackle sack while Rob and Duncan derigged below me. By 00.15 I was at the base of The Lubricator, contemplating the soaking I was about to get, while Rob was at

the top of the long hang. He and Dunks pulled all the rope up and bagged it while I huddled under a rock trying to keep warm. I woke up at 1.30 to the sight of the two of them with enormous heavy tackle sacks. We ate, drank, and shivered for an hour, then set off with the bastard heavy things. Just lifting my tackle sack up climbs was a struggle, and mine was the lightest of the three. By the time we'd reached You Lucky Lucky Bastards I was well past my best. Rob played the hero and went ahead with two bags, leaving me with Duncan's and giving Duncan an empty one for the 25m pitch rope. Heave, thud, heave, thud I moved the bag half a metre at a time until Duncan caught me up and took it off me. I practically begged him to give up the derig and go out, but he was having none of it. We met Rob in the chamber just before Dysentery for a council of war. I was struggling to stay awake, much less move my limbs. The lads gave me a prusik bag and told me to go out – they'd take two bags each through the grovels and rifts of Dysentery and Soap Dodgers. I was relieved to be shot of my bag, but still struggled with the climbs. Behind me I heard Duncan and Rob as they inched along. Such was the extent of my knackeredness that they actually caught me up at the end of Soap Dodgers. At 7.45 totally shattered, I was instructed to dump everything at the top of the Pig Fat pitch. Even with only my prusik bag, it still took almost two hours to get out, the others hot on my heels with a tackle sack each. At 10.00 we reached the surface – a cold, clear morning with brilliant sunshine and amazing visibility. The scenery was all the more stunning for the fact we'd been underground for 22½ hours on a totally gruelling trip. Ah, well, it's all good training.

The journey home, 27th-28th October

Oliver Trueb

It was time for me to leave Tian Xing. Liu Tang agreed to drive me to Wulong. My 30kg bag was strapped to his motorbike, I hopped on and off we went. The next hour was the most frightening experience of the entire expedition. I arrived after dark and now I saw the road for the first time. I had not the slightest idea of what was waiting for me. We coasted down with the engine turned off, slipping and sliding on the muddy surface. The brakes must have been red-hot and the driver has probably super human finger-power to pull them. I was wondering whether I would be killed by the fall itself or by my bag falling on me in case of an accident. We had a flat tire shortly before Jiang Kou and this thankfully slowed us down. Unfortunately the steering was now tricky and sometimes we used the entire width of the road, coming dangerously close to the steep slope that descended hundreds of metres into the Wu Jiang valley. A pit stop in Jiang Kou solved this problem and soon we were roadworthy again. The road to Wulong was paved, there was not much traffic and my adrenaline levels went back to normal.

The movie "Speed" dubbed into Chinese was shown in the bus back to Chongqing. The bus driver took a few hints from the movie and we reached our destination in about three hours. Passengers complained to the driver that they want to go to the toilet but he kept going. I was quite relaxed; nothing could shock me after the Tian Xing - Jiang Kou section...

I checked back into the hotel and caught up with my mates who were in Chongqing on business. Shower, shave, food and off to "Falling", the hottest club in town. Hours of prusiking out of Dà Kēng had given my leg muscles the right training for non-stop dance floor action, alcohol flowed like rivers, dice rolled and the girls got systematically drunk left right and centre. The way back to the hotel was a blur and most likely not very direct. Some rest, a flight, painfully climbing the stairs to my apartment and finally home.

7 Summary of accounts

Figures in UKP unless stated otherwise.

Income

The expedition was supported by external grants, but most income came from personal contributions of members.

Grant income	
Royal Geographic Society	750.00
National Speleological Society	126.32
Ghar Parau Foundation	1000.00
Meggafash	90.00
Subtotal	<u>1966.32</u>
Spares kit sales	5.88
Personal contributions	8292.55
TOTAL	<u>10264.74</u>

Expenditure

Expedition equipment expenditure This section includes all equipment purchased by the expedition.

Gear	
Camping equipment	2.00
Data management supplies	157.39
Drill batteries	138.56
Electric supplies	36.31
Maintenance	17.07
Miscellaneous	5.60
Rigging equipment	64.39
Spares kit	2.93
Storage	83.33
Surveying equipment	184.06
Emergency fund	411.90
Subtotal	<u>1103.55</u>
Medical	2.33
TOTAL	<u>1105.88</u>

Kitty expenditure (in RMB) This section includes all expenditure, excluding equipment, which was considered to be the responsibility of the expedition as a whole. The figures are given in RMB as most of the expenses were incurred while in China.

Prospectus and interviews	532
Photography and video	4105
Report	1474

Food, drinks, etc	4771
Accommodation	3141
Equipment shipping	1462
Gifts	131
Miscellaneous	7
Total	<u>15623 RMB</u> £1041.55
per person	1116 RMB £74.40
per man day	45 RMB £2.98

Personal expenditure This section includes costs incurred by individuals as part of the expedition.

Flights	5761.32
Buses etc. in home country	100.00
Inter-town transport in China	420.61
Local transport and porters	20.00
Personal meals	81.54
Personal accommodation	136.38
Personal gear	1251.82
Visas	320.86
TOTAL	<u>8092.55</u>

Summary of expenditure

Equipment expenditure	1105.88
Kitty expenditure	1041.55
Personal expenditure	8092.55
TOTAL	<u>10239.98</u>

Summary

Total expedition income	10264.74
Total expenditure	<u>10239.98</u>
Surplus	24.77

8 Acknowledgements

The expedition owes a debt of gratitude to the Ghar Parau Foundation, the National Speleological Society, and the Royal Geographical Society (with the Institute of British Geographers) for financial support; to Meggaflash for excellent PF200 flashbulbs; and to Andy Eavis and the China Caves Project for continued loan of equipment, support and advice. The expedition would also like to thank the People's Government of Wulong, Prof. Zhu Xuewen and the Guilin Karst Institute, our host Mrs. Wei, and the kind people of Tian Xing village.

Appendix A: Expedition equipment

Category	Item	Description	#	Category	Item	Description	#	
Bags	Drybags	L heavy-duty	9	Drills	Drill	Bosch GBH	4	
		L thin	1			24VRE drills		
		XL thick	5		Lead acid drill batteries	7Ah 24V	1	
		XS thin	1		Lead acid charger	Charger 12V	2	
	Map cases	Ortlieb	2		NiCd charger	Bosch	1	
	Prusik bags		9			Home-made	1	
	Radio bag	Ortlieb	4		NiCd drill batteries	Bosch 1.3Ah	4	
	Tackle sacks		15			NiCd 2.5Ah 24V	1	
	Basecamp	Clothes hangers	Assorted		1		NiCd 5Ah 24V	1
		Dryboard			2	Electrical	Multiplug	
Dryboard marker			1	Plug adapters			2	
Duvet			6	Voltage regulator			1	
Gloves		Assorted	3	First aid	First aid bag		1	
Kettles			1		First aid spares		1	
Mugs		Assorted	1		Surface first aid		6	
Pots		Pressure cooker	1	Flotation	Buoyancy aids		2	
Scrub brushes		Assorted	3		Darren drums		3	
Tarp			1		Float cord		2	
Batteries		Washing tub		1	Food	Cave snacks	Barrel of cave snacks	0.5
		9V		1		Surface food	Barrel of drinks and soups	1
		Battery chargers		7		UG camp food	Barrel of UG meals	1
	Flatpacks		17			Barrel of mash	1	
	Rechargeable AA		69	Guest SRT		Complete SRT kit		2
	Rechargeable AAA		21			Photo	Bulb firers	For PF200
Biology	Alcohol	75% alcohol	3	Flashbulbs	PF200		45	
	Bottles	Nalgene	1		PF50	1		
Camping	Butane stoves	Kovea mini	3		Slave units	Firefly	2	
		Fuel bottles	0.5 L	1	Radios	Radio chargers		3
			1 L	7		Radios		9
	Hexamine stoves		1	Rescue	Hand jammer		2	
	Isobutane canisters		36		Hot water bottle		1	
	MSR pump	MSR bottle pump	2	Rescue krab		4		
	Petrol stoves	Coleman	3	Rescue pulley		2		
		MSR Whisperlite	1	Rescue runner		1		
	Pots	Optima	1	Storm shelter	Vango 800	1		
		UG cooking pot w/ lid	3	Stretcher		1		
	Roll mats		1	Survival bags	big orange	4		
	Stove spares	MSR spares kit	1	Rigging	Bolts	M8	50	
	Utensils	Spoons	5		Cones		56	
Computer	CD writeable		25		Cord	5mm, 80m	1	
	Parallel cable		1			6mm, 10m	1	
	Printer	BJ 30 Printer	1			7mm, 2.5m	1	
	Printer ink	BJ 30 ink	2			7mm, 3m	1	
	Scanner	Canoscan LiDe20	1			8mm, 4m	1	
Speakers			2	Drill bits	10mm medium	1		
	Chisels	Chisels	1					

Category	Item	Description	#	Category	Item	Description	#
		12mm medium	1			23	1
		6mm short	2			26	2
		8mm extra long	1			27	2
		8mm medium	5			30	1
		8mm short	3			34	1
	Hammers	B and Q	1			35	2
		Camp bolting	1			38	1
		Petzl bolting	2			39	1
	Hanger	Bollard	4			40	1
		Clown	3			49	1
		Bend	11			50	1
		Twist	185			53	1
		Ring	11			55	1
	Krab Locking D		64			56	1
	Krab Locking Oval		6			61	1
	Krab Snap D		10			62	1
	Krab Snap Oval		2			67	1
	Ladders	10m	2			68	1
	Maillons	Standard	242			70	1
		Thick	10			72	1
		Thin	27			79	1
	Rockpeckers		2			82	1
	Rope protectors	Not red	4			160	1
		Red	25				
	Slings	Handline	6	Spares	Dynamic	36	1
		Long	11		Central MR	10mm D	1
		Medium	19		Chest ascender	Petzl Croll	1
		Short	8		Chest harness	Petzl Serpentine	1
	Spanners	13mm	5		Descender	Petzl Stop	1
	Spit drivers	Petzl metal	1		Hand jammer	Petzl Ascension	1
	Spits		89		Harness	Petzl Fractio	1
	Thru bolts	120mm	19		Headtorch	Zipka	1
		50mm	218	Stationary	Stop top bobbin	Petzl	1
		57mm	149	Surveying	Printer paper	A4	0.5
		65mm	26		Altimeter	Analogue	1
		75mm-80mm	48			Suunto E203	1
		assorted M8	176		Clino	Silva Clinomaster	3
		M10	9			Suunto PM5-360	1
	Wire tethers		1		Compass	Silva Type 80	3
						Suunto KB14-360	1
Rope	9mm	5	1		Flagging		4
		5	1		Instrument pouches		3
		8	4		Nail varnish	Nail varnish w tethers	7
		9	2				
		10	3		Pencils	Bic	8
		11	2		Permanent markers		8
		12	3		Prongs		34
		13	3		Protractors	Therion	1
		14	2		Scale rulers		1
		18	1		Survey paper	Waterproof paper (blank)	100
		20	2				

Category	Item	Description	#
		Waterproof surveying paper	150
	Survey tapes	Tajima 30m	2
		Tajima 50m	4
Tools	Adhesives	Adhesives bag	1
	Drill tools		1
	Foam padding		1
	Gear tape		2
	Hacksaws		1
	Slasher		1
Video	Video batteries	Lead acid 7Ah 12V	2
	Video lights	Dichroic bulbs 50W 220V	19

Appendix B: Survey trips

Date	Cave	Survey Name	Total (m)
03/10	Liù Chǐ Aōkǒu Xià Dòng	downstream	279.08
04/10	Liù Chǐ Aōkǒu Shàng Dòng	day1	247.3
05/10	Su Jia Bao	entrance	17.26
05/10	Liù Chǐ Aōkǒu Shàng Dòng	day2	470.57
07/10	Su Jia Bao	wetpitch	37.68
08/10	Liù Chǐ Aōkǒu Xià	further_downstream	1002.16
09/10	Dà Kēng	ferry_man2	520.25
10/10	Dà Kēng	ferry_man3	786.85
10/10	Liù Chǐ Aōkǒu Xià Dòng	beyond_potato	264.35
16/10	Liù Chǐ Aōkǒu Xià Dòng	dysentry	159.02
17/10	Liù Chǐ Aōkǒu Xià Dòng	right_kind_of_disco	182.11
19/10	Liù Chǐ Aōkǒu Xià Dòng	you_lucky_lucky_bastards	258.4
21/10	Kēng Dàng Dàng	entrance	89.34
21/10	Liù Chǐ Aōkǒu Xià Dòng	riggwelter	222.45
22/10	Liù Chǐ Aōkǒu Xià Dòng	upstream	236.27
22/10	Mí Dòng	no_chocolate	338.97
23/10	Lánmù Shù Dòng	toukui	216.24
24/10	Lánmù Shù Dòng	cats_and_dogs	93.64
24/10	Dà Kēng	lake_section	193.64
24/10	Dà Kēng	topless	186.44
26/10	Lánmù Shù Dòng	hope	71.44
26/10	Lánmù Shù Dòng	hope	141.95
27/10	Chá Zǐ Tan	entrance	160.16
28/10	Lánmù Shù Dòng	typhoon	37.85
29/10	48H-I12-96	entrance	148.16
30/10	Liù Chǐ Aōkǒu Xià Dòng	riggwelter	26.88
30/10	Liù Chǐ Aōkǒu Xià Dòng	penetrator	146.54
31/10	Kēng Dàng Dàng	itches	193.87
02/11	Chá Zǐ Tan	third_pitch	169.74
02/11	Liù Chǐ Aōkǒu Xià Dòng	blue_balls	370.42
04/11	Bamboo Cave	entrance	168.59
07/11	Bamboo Cave	cascade	308.56

07/11	Tong Luo Jing		62.34
09/11	Lánmù Shù Dòng	occluded_front	102.12
09/11	Bamboo Cave	gurgle	1237.05
11/11	Liù Chǐ Aōkǒu Shàng Dòng	muddy	153.95
15/11	Liù Chǐ Aōkǒu Xià Dòng	big_bang	337.32
22/11	Lánmù Shù Dòng	occluded_front2	179.89
22/11	Liù Chǐ Aōkǒu Shàng Dòng	50_to_life	66.24

Appendix C: Further reading

Boiko, Ilya. *Tian Xing 2004: Russians go! Expedition 2* (14) March 2005: 98-103.

Garrett, Rob. *Liu Chi Aokou Xia (China's deepest cave?)* Depth Through Thought **14** (9) 20 October 2004.

Lynch, Erin. *Tian Xing: report from the field*. Descent (181) Dec/Jan 2004/2005: 18.

Lynch, Erin. *The unreported expeditions of 2004: Hong Meigui in Nandan ... and Tian Xing*. Descent (182) Feb/Mar 2005: 17.

Appendix D: Report distribution list

Copies of this report will be placed with the following institutions:

The Bodleian Library, Oxford;

Institute of Karst Geology, Guilin, China;

National Caving Library;

The Royal Geographical Society (with the Institute of British Geographers).

Electronic copies are available for free download in pdf format from

hongmeigui.net/expeditions.php?expedition=tianxing2004§ion=report