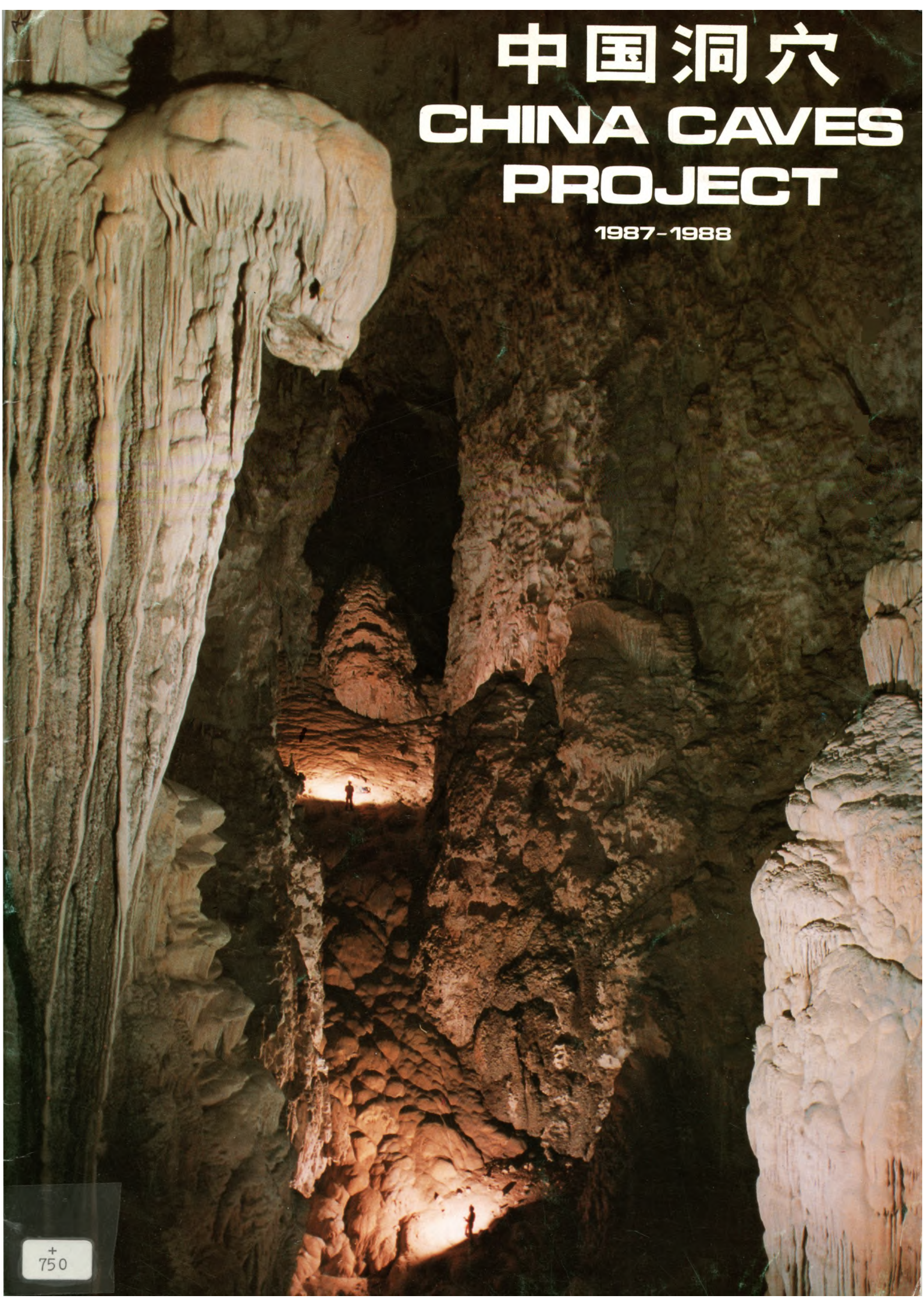


中国洞穴 CHINA CAVES PROJECT

1987-1988



+
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**CHINA CAVES PROJECT
1987 – 1988
THE ANGLO-CHINESE PROJECT IN
CAVES OF SOUTH CHINA**

87/4 + 88/12

**THE PRODUCT OF CO-OPERATION AND FRIENDSHIP
BETWEEN
THE INSTITUTE OF KARST GEOLOGY, GUILIN
GUIZHOU NORMAL UNIVERSITY**

BRITISH CAVE RESEARCH ASSOCIATION

Patron: H.R.H. Duchess of Kent

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INTRODUCTION

ANDY EAVIS

The western world has known for many years that China contained very spectacular limestone scenery. Paintings and photographs litter the walls of Chinese restaurants and the pages of geography books. It is only recently, however, that the scale and magnitude of the caves associated with this limestone has been appreciated.

In 1982 Andy Eavis and Tony Waltham went on a short tourist trip into Guilin, at that time one of the few open areas of China. They soon realized that these paintings and photographs were not exaggerations, but to some extent belittled the magnificent Chinese scenery. They also had the opportunity of visiting tourist caves and soon began to realize the potential.

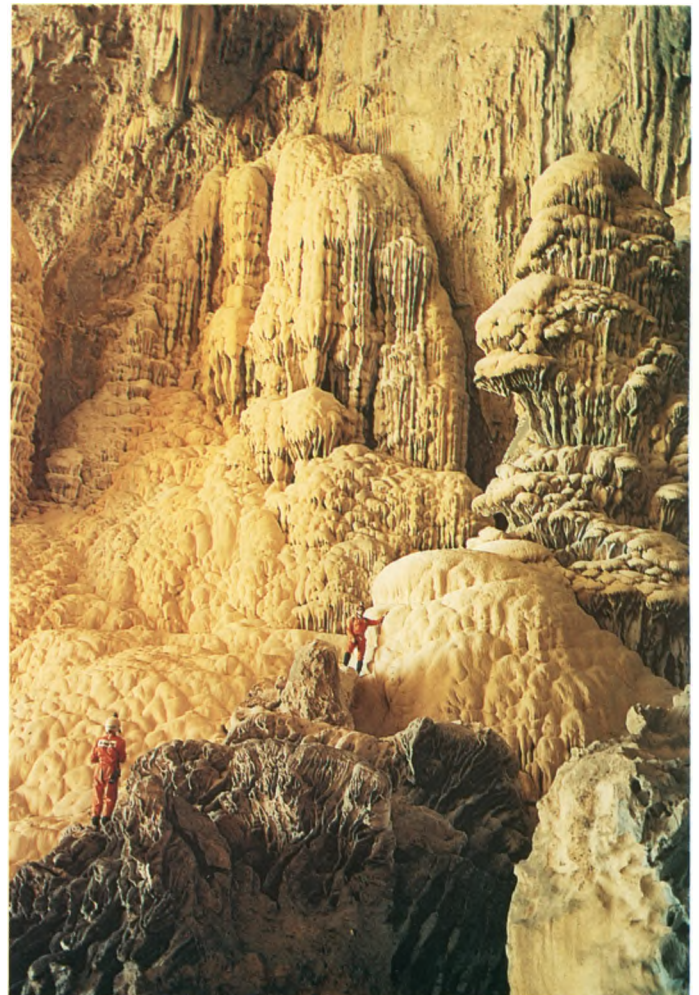
With the help of Dr Majorie Sweeting and the co-operation of the Guizhou Normal University and Guilin Karst Research Institute a ten man reconnaissance was organised for 1985. The detail of this reconnaissance was helped by a visit of Tony Waltham to the areas in 1983. The six weeks in the field and the areas covered convinced the caving world that China had the largest area of limestone and potentially more caves than the rest of the world put together.

The results of that reconnaissance was published in the China Caves '85 report and the work formed the basis for continuing Anglo-Chinese co-operation.

The next stage in the exploration of the karst areas of China by the China Caves Project team took place in late 1987 and early 1988. The results of those expeditions forms the basis of this publication.



LOOKING TOWARDS SAN CHA By Andy Eavis



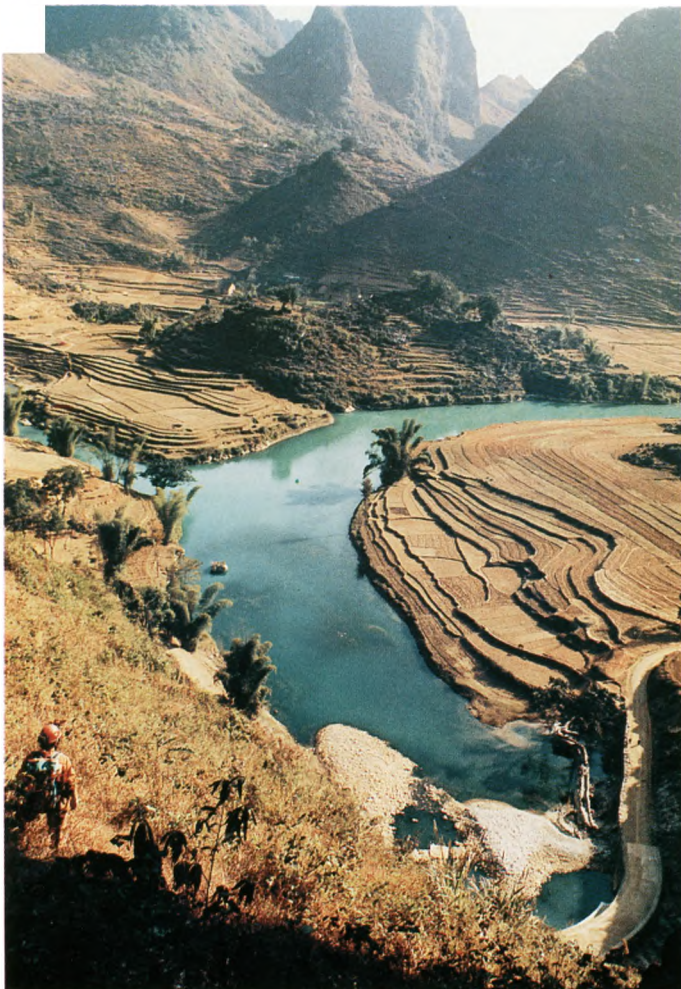
MASSIVE STALAGMITE FORMATIONS IN QIAN DONG 2 GUANGXI
By Jerry Wooldridge

GEOLOGY, SCENERY & SCIENCE

MARK NOEL



MARbled ROCK AND ERODED STALACTITE IN THE ENTRANCE SERIES OF SAGUO DONG By Andy Eavis



VIEW OF PAN YAN RIVER FROM UPPER ENTRANCE BEIMO I By Jerry Wooldridge

The latest China Caves Project Expeditions to the provinces of Guizhou and Guangxi represent, in geological terms, the culmination of 500 million years of careful preparation. Lime-rich muds, deposited in a warm sea, were transformed by heat and deep burial to form the limestone rocks now exposed in a belt of almost half a million square kilometres across southeast China. Massive limestones, long periods of tropical weathering and a lack of glacial planation, have resulted in spectacular karst landforms whose grandeur has long been the keynote of classical Chinese painting.

In terms of karst statistics China provides superlatives in every respect and these emphasise the potential for discovering new caves of world class length, scale and depth. In Guangxi, Guizhou and Yunnan alone, limestone spans an area of around half a million square kilometres with up to 3000m of carbonates in places. Because soluble rocks cover one third of the country, China is attuned to the economic problems relating to karst and leads the world in such novel technologies as converting the power of cave rivers into hydroelectricity.

The lowlands of Guangxi undoubtedly provide the world's finest examples of tower karst scenery. Where prolonged uplift has kept pace with denudation, a mature landscape has evolved, characterised by precipitous towers rising above relatively level areas of alluvium. Collapse of foot caves and undercutting by river meanders maintains the steepness of the towers in a landscape referred to by the Chinese as 'fenglin' or 'peak forest plain'. Such scenery forms a stunning backdrop to the Li Jiang River as it meanders south from Guilin towards Yangshuo; an exhilarating voyage enjoyed by thousands of tourists each year. In Guizhou Province 'fengcong', or 'peak cluster' replaces fenglin as the predominant karst scenery, possibly because uplift rates exceed denudation. In general, the development of a particular karst terrain expresses a complex interaction between tectonic, lithologic and climatic factors; this currently forms the subject of much debate in China and one topic of our expedition's research.

Intensive farming of the alluvial plains, in tune with the seasonal rains, provides a yearly kaleidoscope of colour progressing through ochre, green and brown. Major crops are sugar cane and rice which are sown and reaped in a tempo which is untouched by centuries. In contrast, the precipitous slopes of the towers produce a scanty harvest of brushwood which is cut for both home fuel and charcoal manufacture.

Many of the towers are punctured by high level fossil caves which contain deposits in the form of sediments, speleothems and sometimes guano. These materials provide important clues as to the age of the cave systems and the character of the surface environment at the time of deposition. A number of scientific methods are being employed in the analysis of materials collected during the expeditions. The weak remnant magnetism of stalagmites records the orientation of the Earth's magnetic field at the time of formation. Measuring the magnetisation direction forms the basis of a dating technique which is being applied to oriented samples collected from eight high-level caves in Duan County. Pollen grains captured in the stalagmites will also be studied in order to catalogue contemporary faunal environments. Many caves were explored where charcoal and pottery scatter, earth and stone structures presented visible testimony to the long tradition of cave use in China. Archaeological excavation will undoubtedly develop a more detailed picture unfolding into prehistory. Man shares his caves with smaller creatures whose lifestyles were revealed through a biological survey conducted during the expedition.

GUIZHOU 1987

DICK WILLIS

The province of Guizhou holds one of the most impressive karst areas in the world. An enormous block of folded limestones forms a plateau about 400km across, rising from about 1000m in the east to over 2500m in the Mei Hua Shan, at the western edge of Guizhou.

This high karst was visited by a group of four British cavers in 1985. Working with scientists from the Geography Department of the Guizhou Normal University they conducted a reconnaissance of the Mei Hua Shan and the areas around Liupanshui City District before visiting the areas eastward towards the provincial capital, Guiyang.

During the short recce' two members of the party, Pete Smart and Colin Boothroyd, entered the huge entrance of the Fala River Cave where, 50m or more above a raging torrent, they followed a narrow traverse path around the wall of the cave to a series of underground mine workings. Here the local people processed old guano deposits to extract chemicals for the manufacture of explosives. The farmers' potential as cavers was unquestionable – part of the path involved shinning across two jammed bamboo poles lodged against irregularities in the cave wall.

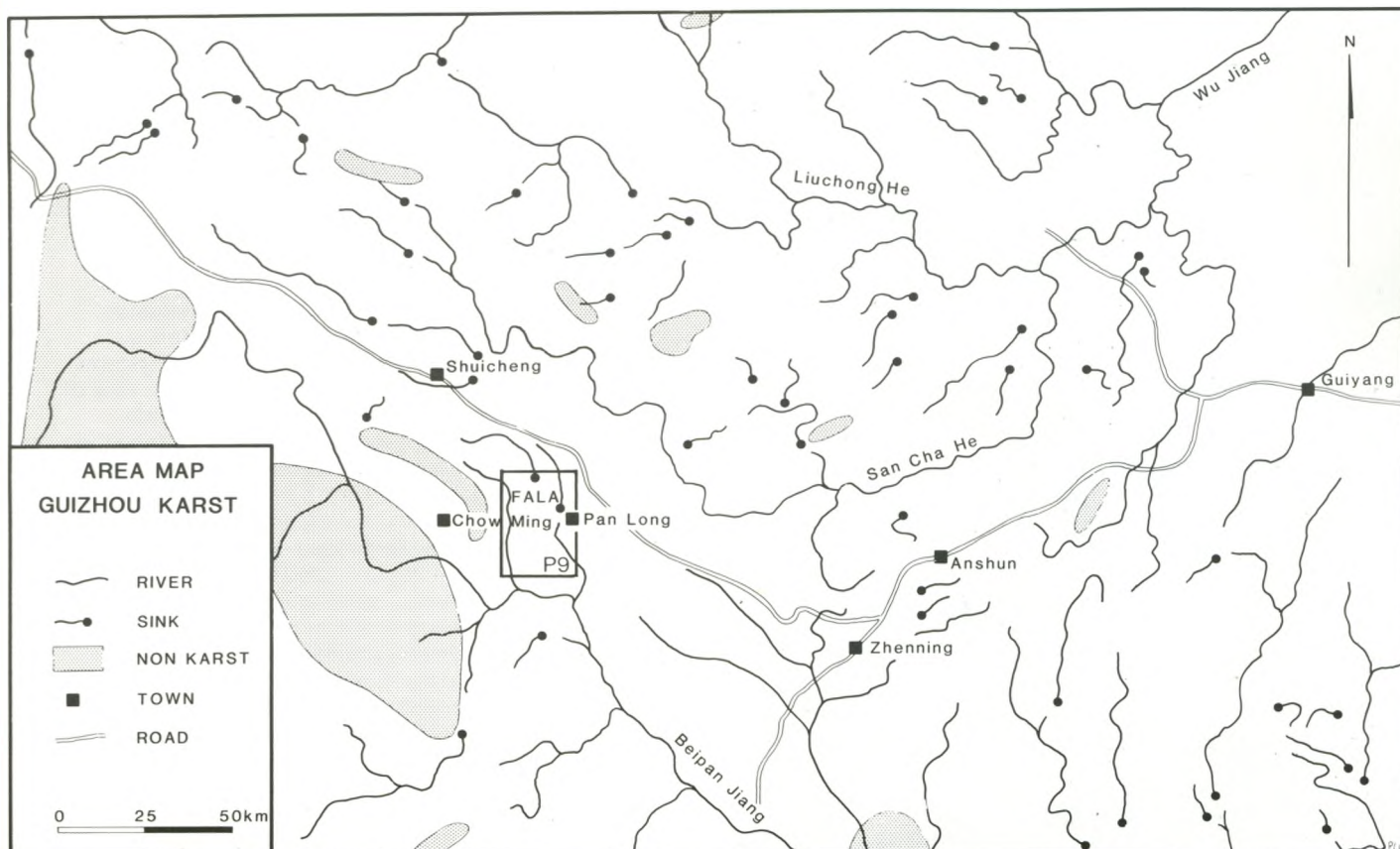
Pete and Colin had neither the time nor the equipment to complete the exploration of the Fala. However, their visit confirmed the suspicion that this cave was the entrance to a massive underground drainage network and they guessed that the area deserved a thorough speleological investigation. Leaving the cave they completed a massive walk and rejoined their colleagues in Liupanshui City (Shuicheng).

That night, the cavers and their Chinese colleagues studied the maps, searching for the resurgence of the waters which disappeared underground in Fala. As their searching fingers moved further and further outwards from

the position of the sink it became clear that wherever the resurgence was finally found, it would be a long way from Fala; the potential was certainly there for a major cave system.

In this way the objective for the 1987 expedition was identified. In the days before they left Guizhou the four cavers and their Chinese friends laid the plans for the return visit. Financial and logistical details were discussed and agreement was reached on the size and composition of the return team. During a visit to the UK in 1986 by four academics from Guiyang it was confirmed that the Provincial authorities had given their blessing to the expedition. On October 16th 1987 nine cavers landed at Guiyang airport, laden with heavy rucksacks; the first stage of the China Caves project was underway.

The first objective for the 1987 team was to return to Fala to continue the exploration. It closed down abruptly at a sump. The team moved their attention to the major surface features south of Fala.





THE FALA RIVER RE-ENTERED AT THE BOTTOM OF SAGUO DONG By Andy Eavis

SAGUO DONG ITS HIGHLIGHTS

DAVE CHECKLEY

It was our first real day in the field and Saguo Dong was the second cave of the day. Surrounded by fascinated children we donned our gear and descended four short vertical sections in the gorge to reach the entrance shaft. We only used that route once because the children followed us hand over hand down the ropes and the next pitch was free-hanging for twenty metres. The children could have hurt themselves on that one....

The alternative route down the spectacular entrance shaft involved a sixty metre pitch, passing a group of palm trees on a ledge. Placing a bolt half way down caused a great stir with the spectators, who were still there late that night when we came out tired but well pleased with our efforts.

I had the pleasure of rigging much of the delightful entrance series. Short pitches to deep clear pools, interesting traverses and even a tyrolean crossing made it fun. Warm roomy caving – no crawling or tight bits but with some sporting climbs and deep water. It got wetter and wetter as we descended further down beautifully sculptured white-veined rock and smooth, eroded calcite ramps. The rock was so hard that we avoided placing bolts whenever possible, but finding natural anchor points for the rope often tested our ingenuity.

It was on a trip with Tony that we first heard the distant roar of the underground river. I'd just rigged a short ramp pitch and one of the belays had failed on the descent. The others held and I made the pool safely. Waist deep in chilly water I waited for Tony, but I was sure I could hear a deep throated roar. He heard it too and we climbed out of the pool directly on to the lip of the next pitch. A large boulder belay took us to the ledge. The noise was clearer and we both grew impatient. Tony climbed up in search of a belay and excavated an eyehole on a higher ledge. It looked good and with a neat deviation on the way down, the rope fell free to the canal fifteen metres below. Tony waited for me and we set off to greet the river.

The narrow rift suddenly broke out into blackness. We clambered around on the pile of 30m high boulders, looking for an easy way down. We were going to have to abseil off these massive blocks perched at the side of the 70m wide passage. Patience – the only option was to use a rope to descend to the muddy floor. We still couldn't see the river, but the noisy fury of white water filled the air. We were tired but full of ourselves – what a find, we were the first to reach the underground river – and what a cave!

We heard voices. Dick and Colin caught us up. They were excited too and we were soon clambering along the banks of the fast flowing river. We followed it downstream until it began to look exciting, in a narrower canyon section.

But we were out of rope and time was getting on. We would return the next day. We surveyed out in two groups and reached the surface in the cool of the night.

WUJAI DONG

ROO WALTERS

We arrive at the top of a small vertical drop. "How deep do you reckon it is?", I ask Julian. "About five metres, shall I nip back up and get the rope off the first climb, we haven't got any more here?"

Julian is as enthusiastic as ever but the day is late and we sense the cave is going to "go". "It's going vertical Ju, we'll get down this drop only to meet another and it's getting on, we won't get much further without a lot more rope."

Julian agrees reluctantly. "OK. we'll survey out and return with a few hundred metres of rope, we know the cave is going."

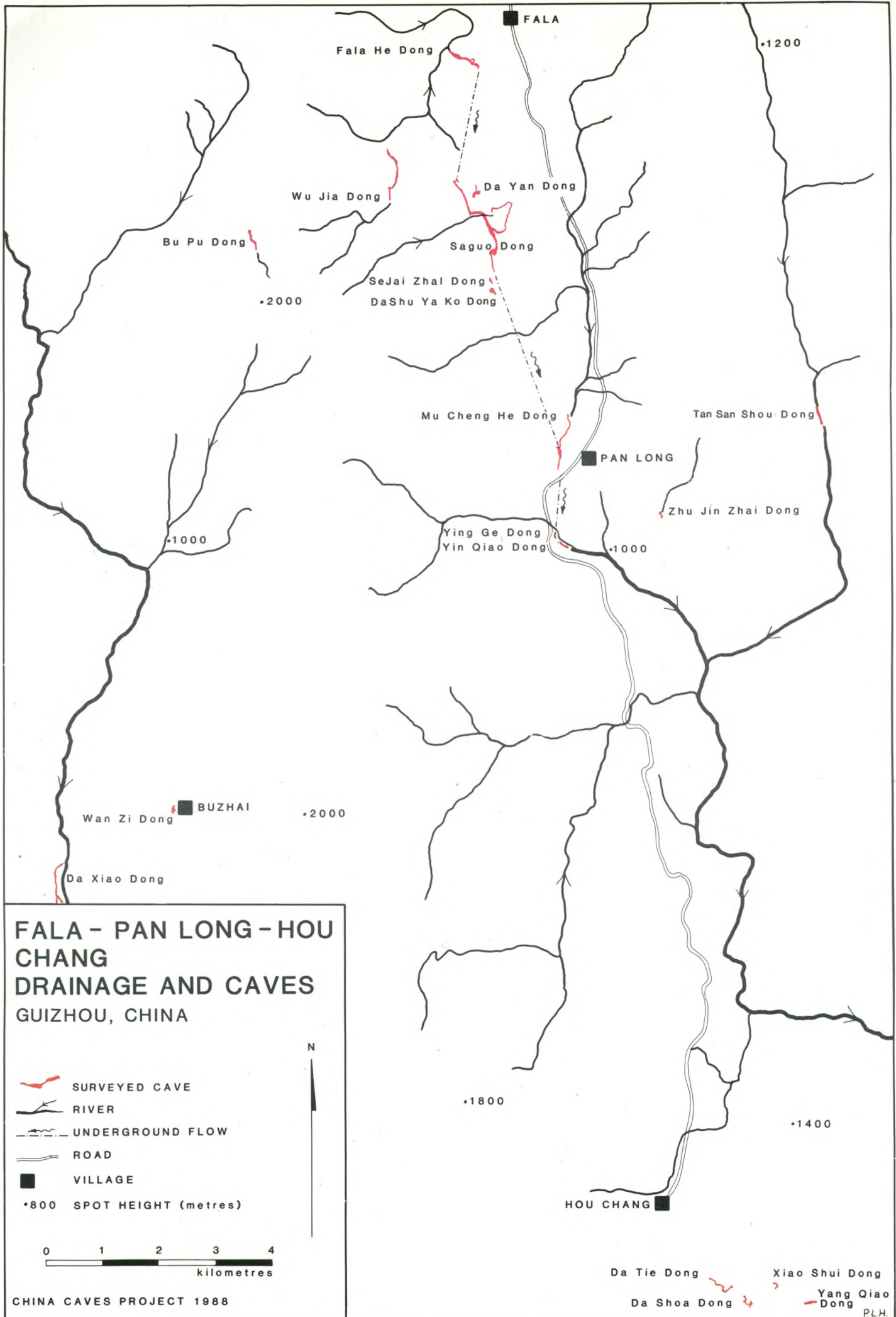
We survey out, one hundred metres of chest deep wading in a narrow canal, a twenty-five metre vertical section, a short climb and two hundred metres of passage lead us to the entrance. We survey up to some higher entrances which we could see from within the cave.

About a week later we return, Colin and Ju are going to push on and survey back from the end point. Meanwhile, Tan Ming and I are to survey in to meet them. They rush off, and the others follow. With the cave going vertical I never expect them to be far in front. We start the survey from the five metre pitch. We enter a descending tunnel, the walls are almost black and highly polished but in places brown and pink calcite flowstone covers them making a really beautiful scene. We survey on for hours in this descending passage with no sign of the others. "So much for it going vertical," I say to Tan Ming, who is beginning to look cold, "Ju has got one on me for persuading him not to push on when we were last here."

Eventually at six-thirty, I decide that's enough. I leave a note for the others showing the last survey point and turn back. Tan Ming is clearly relieved. Very soon afterwards the others catch up; they were only five minutes behind us. I receive the expected sarcastic comments from them but they are truly excited about the cave. "We dropped the tackle," said Julian, "the cave just keeps on dropping down at the same angle." "Where did you get to?" I butt in. "We were stopped by a drop into a huge chamber. We've hit something big."

We exit the cave in an optimistic mood, ready for the next day's exploration. That night I work out the survey data, one and a half kilometres long, three hundred and forty metres deep and still going. The next day finds us charging down the cave again. We soon reach the vertical drop which turns out to be about fifteen metres deep and we rush off down the slope. "A bit like the Berger, Ju," I yell. He agrees. We all feel we've found something special. Then suddenly, the walls come in and the passage appears to stop. A shingle slope down to a miserable siphon is all that remains. I descend to check it out. "Dive it," says Julian, "you're already wet." Gingerly I enter, but it goes deep. This one is not on. We sit for a while feeling fed up that it has finished so quickly. Colin and I survey out to the pitch, while Julian looks for other ways on. But there's nothing.

It's a long haul out carrying three hundred metres of rope that we didn't even use. After dinner I total up the survey, four hundred and thirty metres deep making it the deepest cave in China so far. A small consolation for such an abrupt ending.





AN UNUSUAL DAYS WORK FOR A LOCAL FARMER By Dick Willis

MU CHENG HE DONG

JULIAN WALKER

It wasn't difficult finding the entrance to Mu Cheng – we just followed the large stream at the side of the road until it dropped into a deep canyon and, beyond, the cave. Getting into it, however, was a different matter.

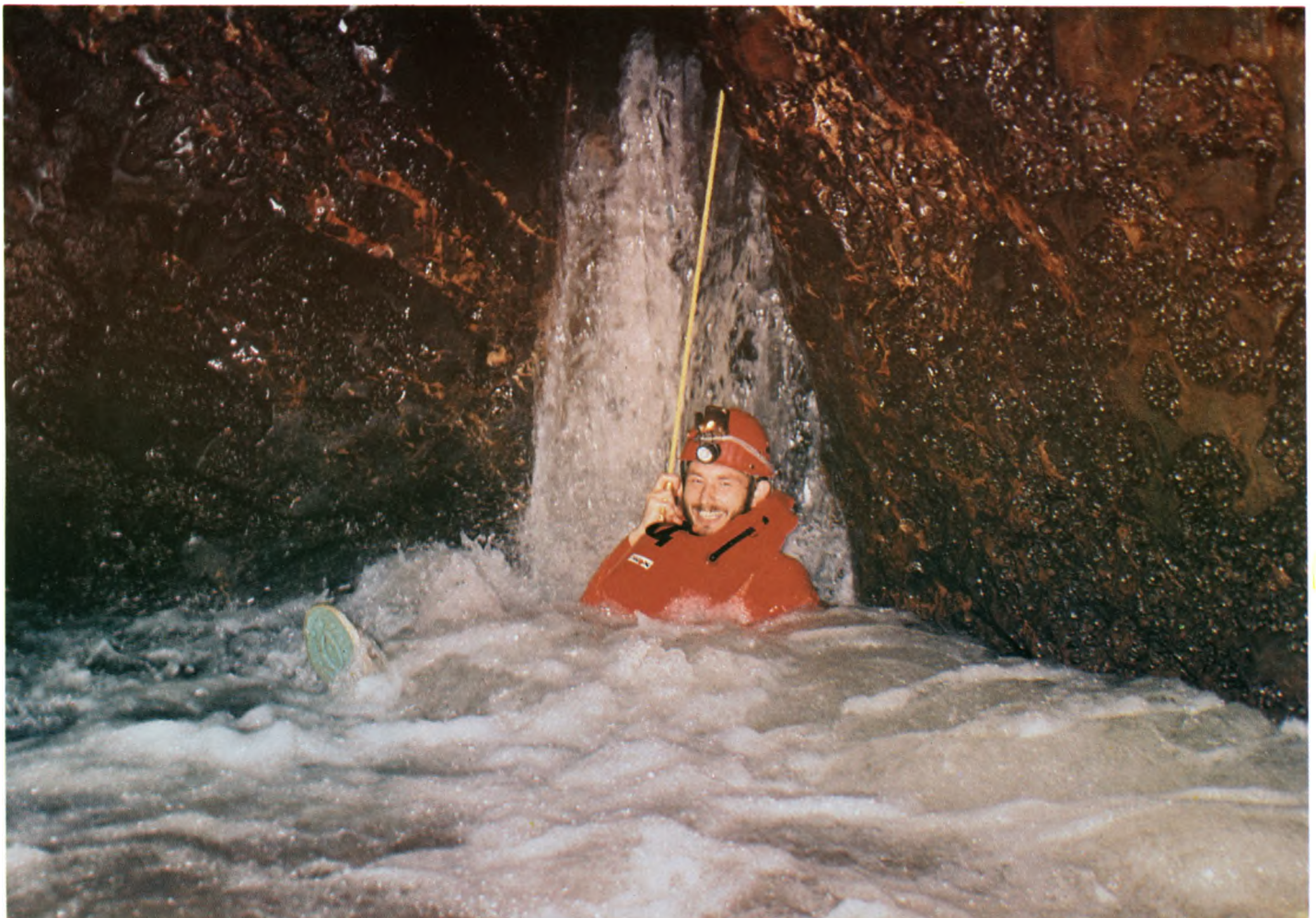
The bolt kit and rigging gear we most obviously needed to descend the 70m entrance canyon was still in customs, probably nearer to Hong Kong than to Pan Long. Instead we had 2 slings and about 100m of rope of dubious Chinese origin. The direct approach into the canyon was obviously out, so we skirted around the sides to the cliffs above the entrance and, more by luck than judgement, found a small tube that led into the top of the stream passage. Belayed to a bush, Tony began to fight through the 1000 years worth of bird nests that filled the tube and with 70m of very imaginative rigging the stream level was reached.

Faced with 3-4 cubic metres per second of water in a 1m wide canyon, we took the only sensible option and pendulumed onto a jammed log. After much discussion, Tony and I decided it should be Colin who should swim off downstream on the end of the rope. He looked worried, spent some time in tying a Karrimat around his waist for buoyancy and, attached to a rope, eventually jumped in – it was only waist deep.

After this progress was easy, wading and climbing along superb sporting streamway between 1m and 3m wide. We passed under a large skylight which on subsequent trips was to provide a much easier, shorter route in. However, we soon met the next obstacle. The way out of a small

chamber was jammed with logs, driftwood and 2 dead ducks where the roof came down. An hour of excavation removed the blockage and we passed through a duck (a wet one, not a dead one) where the roof came within 15cm of the water in a passage only 1m wide. Beyond, progress was again easy until a 10m pitch was encountered. The stream thundered out over calcite flowstone but we could not follow, due to the complete non-existence of tackle. We surveyed out.

Subsequent trips, eased by tackle, rope and life jackets, followed the stream down the 10m waterfall pitch, eventually to join with the massive Fala river. Upstream, the river was followed to a sump. Downstream, despite a concerted effort, it still continues unexplored beyond a long, deep section of fast flowing canal.



HANS FRIEDERICH – WHERE THE MU CHENG HE DONG STREAMWAY ENTERS THE MUCH LARGER FALA RIVER By Andy Eavis

THE LAST DANCE WITH ME

HOWARD JONES

It was our last night in Guizhou. A trip back from the fields via the Huangguoshu Falls, a beautiful tourist attraction in the region.

The de-briefings were over. Three of us had struggled madly to re-pack the cardboard cartons into wooden crates to send the gear on its way to Guilin to await the team coming over in January.

It was the last of many banquets, similar to all the others, except probably a bit more beer was drunk. The Mao Tai challenges, as always, with Roo taking on Professor He to an extent that made my stomach feel awful and I wasn't even drinking the potent brew.

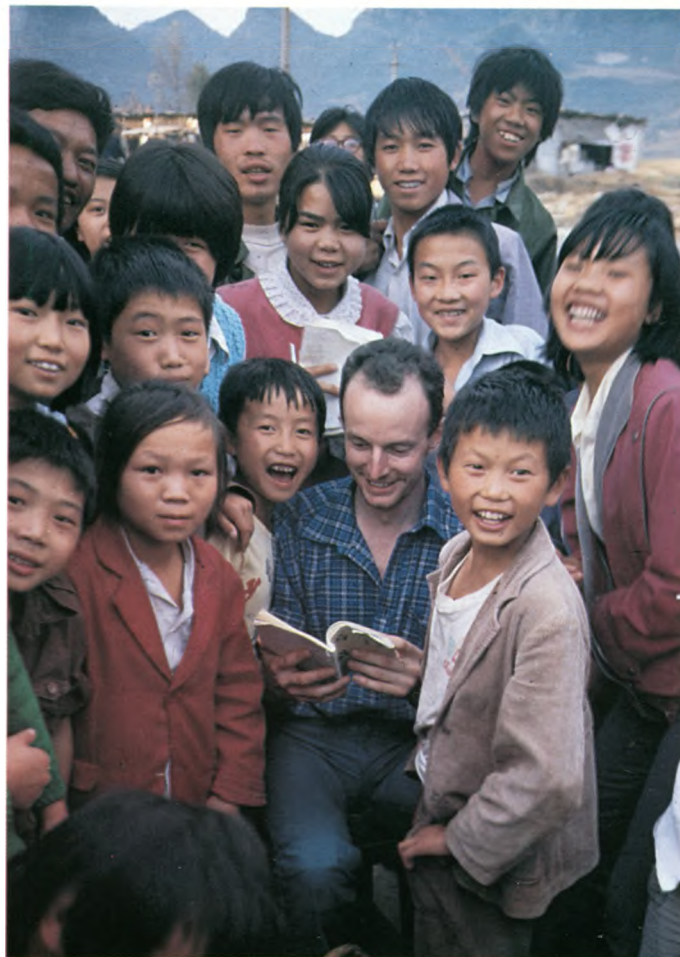
A disco had been arranged, mainly so that Hans who we had promoted as the champion of Holland, could show off his prowess.

The team made merry and treated our Chinese hosts and the cooking and cleaning staff, who were all that were left, to rousing choruses of Old Macdonald's Farm and Swing Low Sweet Chariot, with all the right and a few wrong accompanying mimes. Then, seizing the Chef's hat and writing 'Kiss me quick' on the front in Chinese and on the back in English, we were dragged off to the disco. Being China, this was held in the storey above the Bank of China and, although security was good to get into the disco, I'm pretty certain we could have taken a few yuan home with us. The disco was phenomenally expensive and we got inside to find a live band playing 50's jazz-blues type music. It was very formal dancing, with couples, men and men, women and women, doing kind of slow waltzes around the outside of an enormous hall. It reminded me of scenes of Glenn Miller entertaining the troops in World War 11 and there not being enough women to go round and so everybody danced with everybody else.

We tried to liven things up a bit and Checkley soon formed a circle and we all went haywire in the middle of the floor until we were asked to calm down or we'd be bounced! Roo seized the microphone and announced to a dumbstruck Chinese audience that Howard Jones, the world famous international disco singer was here, but as nobody understood a word that he said the thing passed off without comment.

Julian and I were surveying the scene, when a beautiful Chinese girl came up and asked Julian if he wanted to dance. At the end of the dance she came back and brought some of her friends with her and I ended up with a very attractive Chinese girl who held me close in the slow waltzes, her perfume drifting up into my nostrils. I thought if she could smell me as well as I could smell her, it was a wonder that she didn't go cross-eyed! After five weeks without the company of women, it was almost more than Julian and I could handle. Thankfully we were dragged off to have cold coffee and grapes at half-time by our Chinese hosts before any embarrassing situations could develop! We left the disco, stars in our eyes, and sauntered back towards our accommodation in the university.

Colin tried to sneak a good-bye kiss from Miss Dai but she avoided him with the alarity of a Glaswegian avoiding a charity collector. It was all off to sleep to dream of loves left at home and loves left back at the disco and Checkley turning on the Chinese music and humming "The Last Dance with Me."



HOWARD JONES ENTERTAINS By Dick Willis



WHITE WINE DRINKING – ROO WALTERS TAKES ON XIONG KANGNING By Dick Willis





SAGUO DONG ENTRANCE SHAFT By Dave Checkley



FALA RIVER CAVE ENTRANCE By Andy Eavis



ROO WALTERS IN WUJAI DONG By Andy Eavis

GUIZHOU: THE FUTURE THE RECONNAISSANCE FOR 1990

COLIN BOOTHROYD

Where next? That was the question on everybody's lips as the Guizhou Expedition was drawing to a close. With the Fala/Panlong area 'tidied up', a new area was needed for the 1990 stage of the China Caves Project.

A group of six was hastily gathered together to recce the massive area of cavernous limestone between the Beipan River and the Suicheng Basin. We had two days to cover an area of approximately 500sq km. We choose the village of Chang Ming as our base because on the map there was a blue line that stopped nearby; a river sinking into the limestone.

Driving from Inparshui to the village was not easy, although the road was good, the jeep and the driver reliable, the weather settled: we kept tripping up over caves. Each corner the vehicle turned would be a cue for a fresh stop, but we only had time for a quick look at the map, a few photographs, a chat with the locals and occasionally a sortie into the village cave.

15km south of Inparshui we passed the stream that sank into Luo Shui Dong. Overlooking the sink entrance there are three other large fossil caves. The old caves either close down after a short distance from their entrance or they join deep underground. The principle sink, Luo Shui Dong merited more than an asterisk in the diary. The entrance is an impressive canyon which drops down after 100m to a phreatic tube, only to develop again into a canyon with a deep canal that didn't appeal to the solo explorer. Neither a careful study of the maps nor discussions with the local people helped us to determine the position of the resurgence. The blue line on the map near Chang Ming ran into a cave as we expected, Shoa Yan Zhi Luo Shui Dong. There was no water running into the cave when we were

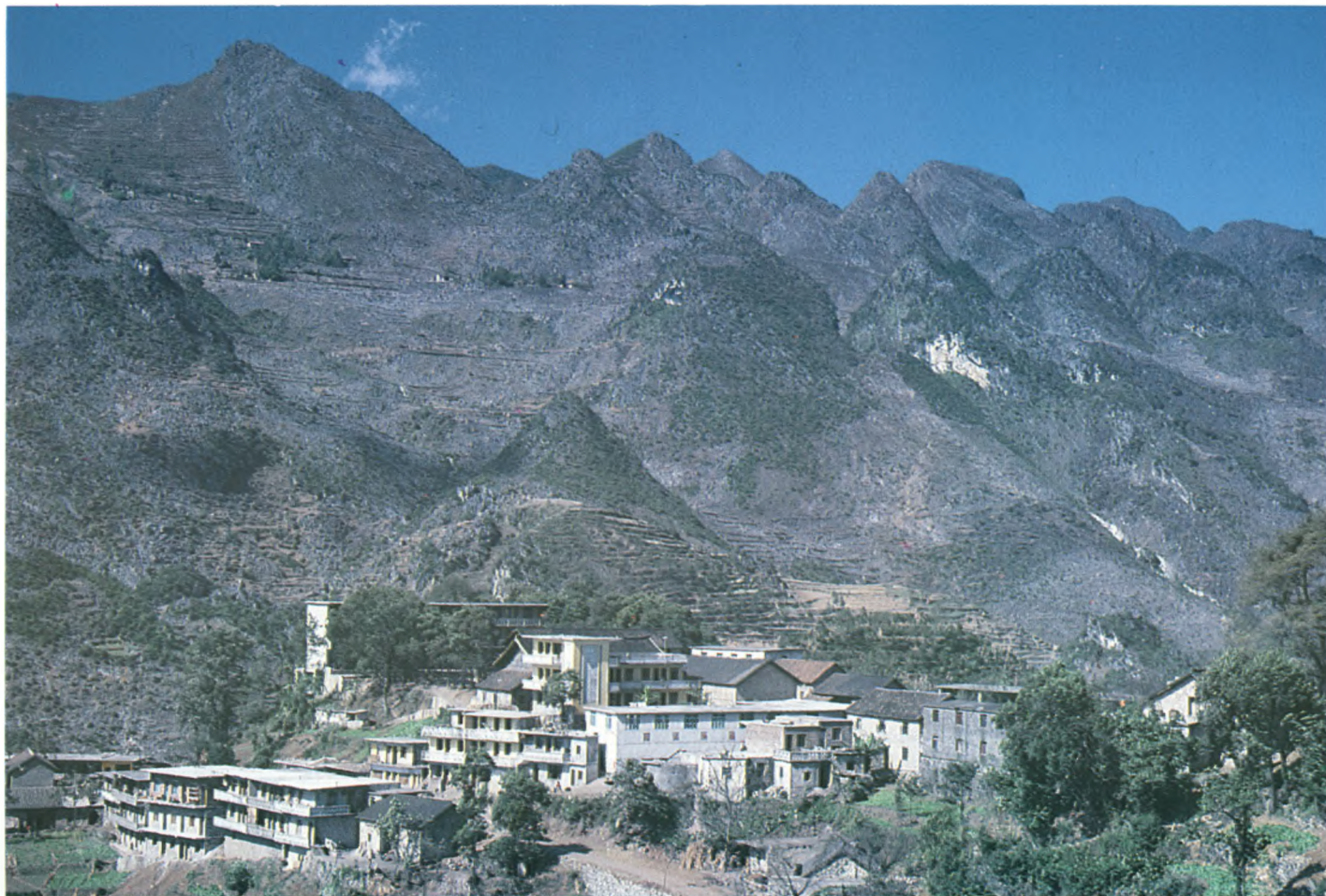
there, although the size of some of the cobbles suggested that the situation was very different in the wet season. Since this was a lightweight trip we only had three ropes, but the temptation of continually looking 'round the corner' was impossible to resist. We descended five and a half pitches using a variety of dubious tactics, before we had to admit defeat. 15m down the last 20m pitch, we ran out of rope. We were left looking at a passage 8m in diameter, with a very strong draught heading out of it.

Where did all the water that sank in our 'area' come out?

There were no obvious resurgences on the map and the locals didn't seem to know of any. The most striking feature in the area was the Beipan Jiang. This turbulent river cuts a deep gorge before it runs south to join the Yu Jiang (Pearl River), and then turns on towards Hong Kong and the South China Sea.

The gorge, which is a protected National Park, has a natural perimeter wall – 1000m high! With the help of a local guide we were shown a small track that led down to the river, the only access along a 30km stretch. The search for resurgences running into the river was almost impossible because the cliffs dropped straight down to the water's edge. However, two of us managed to traverse the walls for about a kilometre. We climbed a dry gully and almost reached a cave entrance. The antics involved in going any further were just too hair-raising and we were forced to turn back.

Conclusion? All of us were certainly impressed by the caving potential of the area covered and we only wished we had more time to conduct the recce more thoroughly. Nonetheless enough had been seen and noted and already the first steps are being taken towards organizing a return trip.



PAN LONG By Dick Willis

GUANGXI

In late December 1987 15 project members left for Guangxi province where, along with colleagues from the Karst Institute, Guilin, they split into 3 teams to work in the counties of Duan, Mashan and Bama.

CAVE DIVING IN CHINA

G. CROSSLEY G. NEWMAN S. JONES

DUAN COUNTY

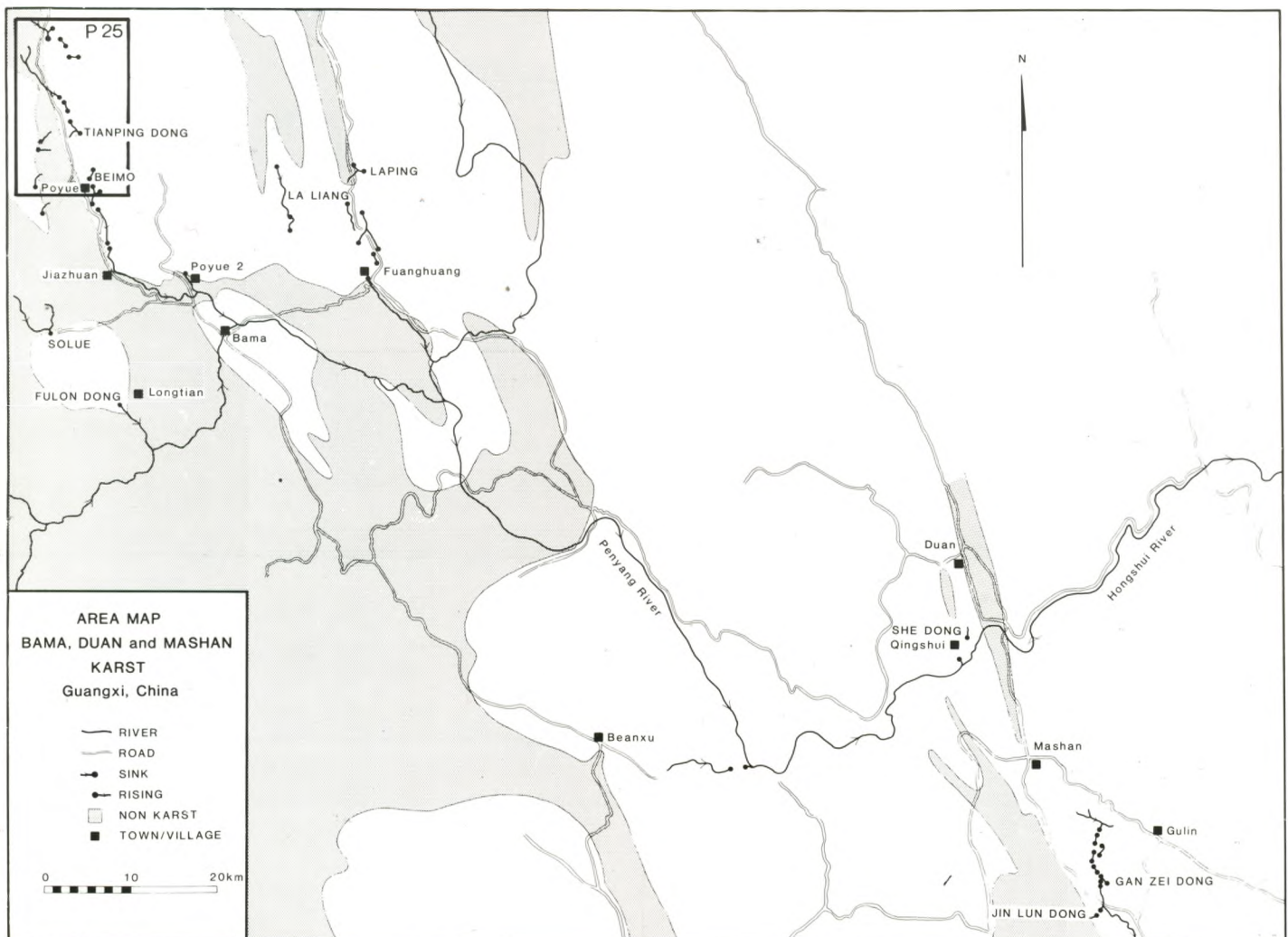
Part of the 1988 Project was given over to the furtherance and understanding of cave diving in China. As well as meeting those requirements it also gave the cave divers within the team the chance to be the first to explore some of the sumps of the world's newest and largest cave diving areas.

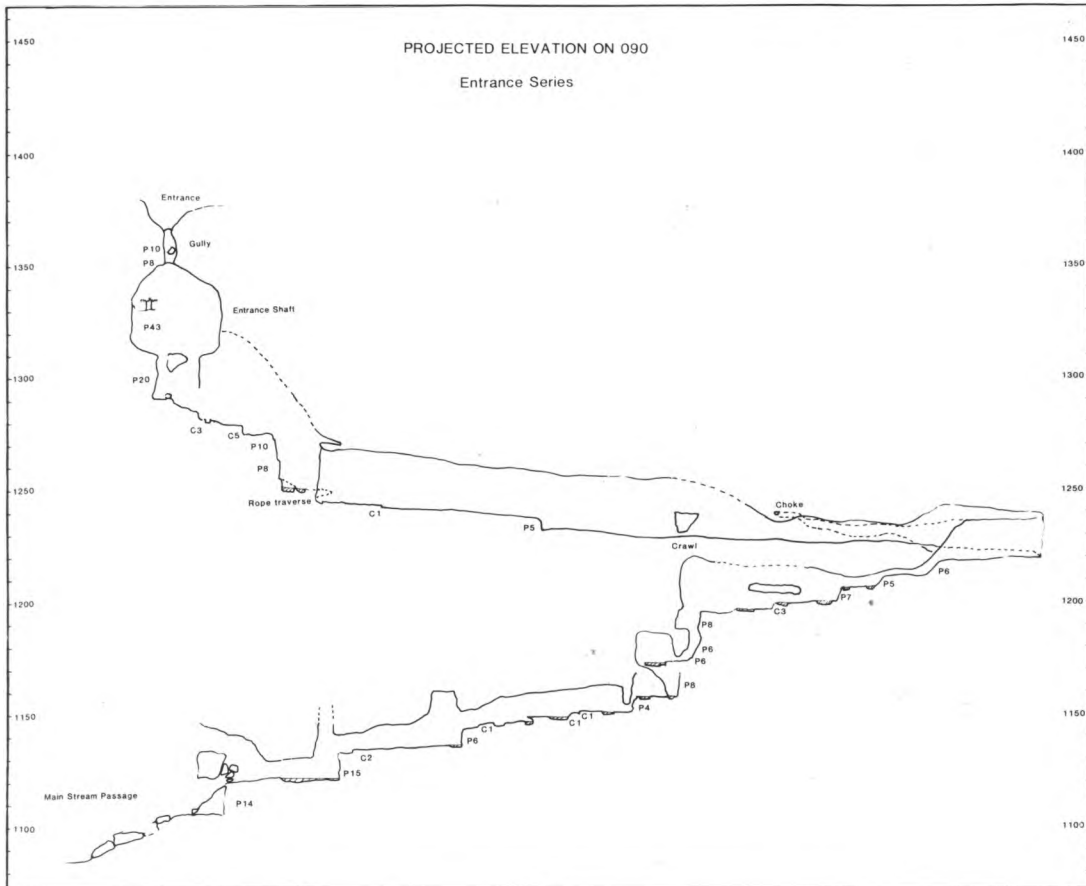
In Duan county, Guangxi, there is a vast flooded underground system enterable through many large surface eyeholes over a wide area. It drains some 1000 square kilometres of limestone to the massive Tisu River resurgence which in the wet season discharges an incredible 400 cubic metres of water every second into the Hongshui Gorge. This is thought to be the largest underground drainage system anywhere in the world. In the dry season the flow drops to 10 cubic metres, equal to the largest resurgence in Britain.

A recce to the Duan area in 1986 had produced many potential sites for diving and so a team of four divers and mountains of equipment which included 2 compressors, 25 cylinders and 5 kilometres of diving line, left the U.K. for China at the end of December. About fifteen sites had been pencilled in for the divers to visit as a start. Two of the divers, Steve Jones and Gavin Newman, arrived in Duan a couple of days before the other two divers, Geoff Crossley and Rob Parker and the day before Rob and Geoff arrived, Steve made the first dive of the trip.



DIVING IN THE TISU RIVER SYSTEM By Gavin Newman





SAGUO DONG

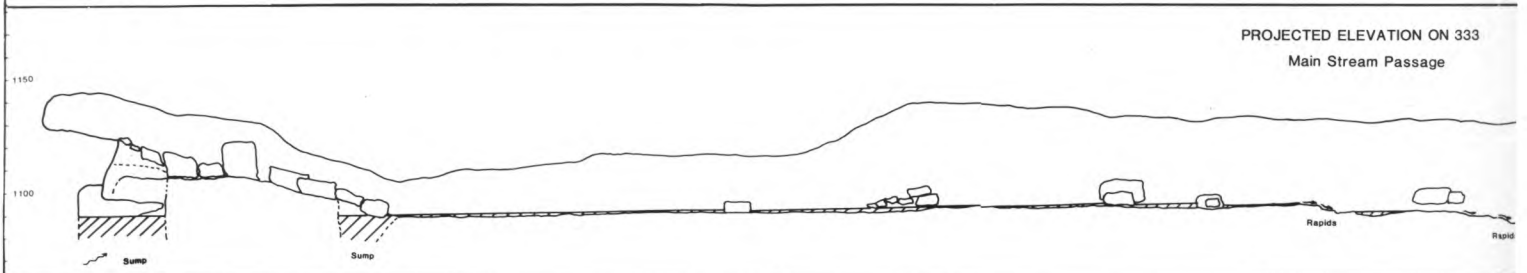
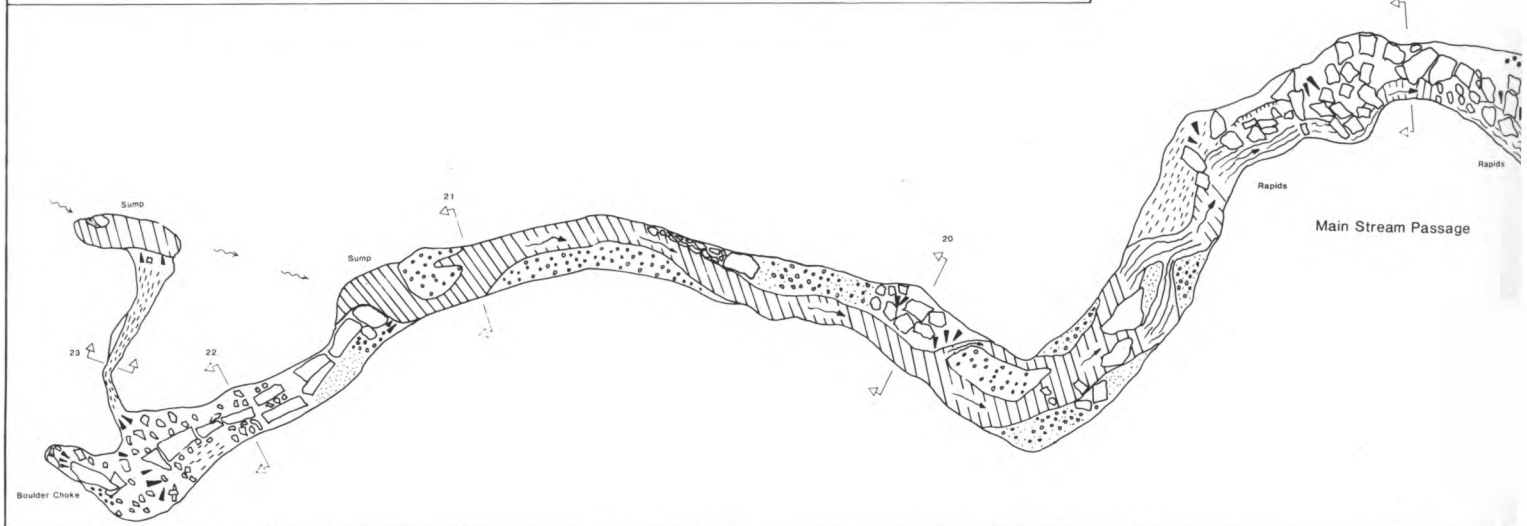
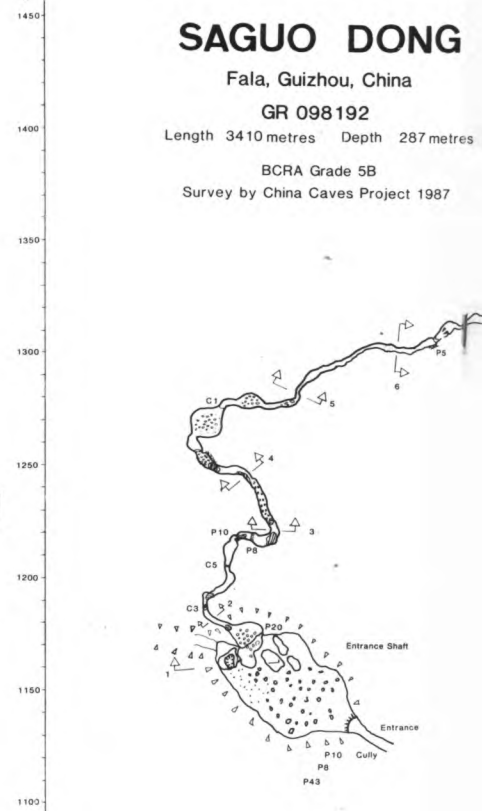
Fala, Guizhou, China

GR 098192

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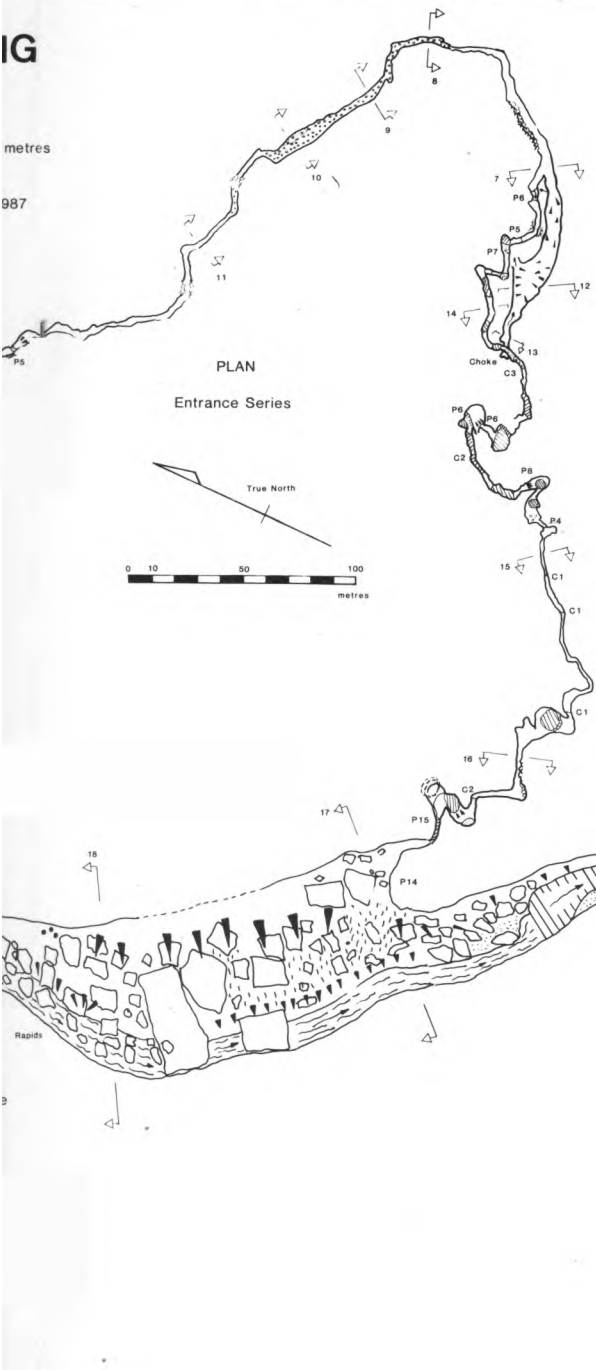
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Survey by China Caves Project 1987

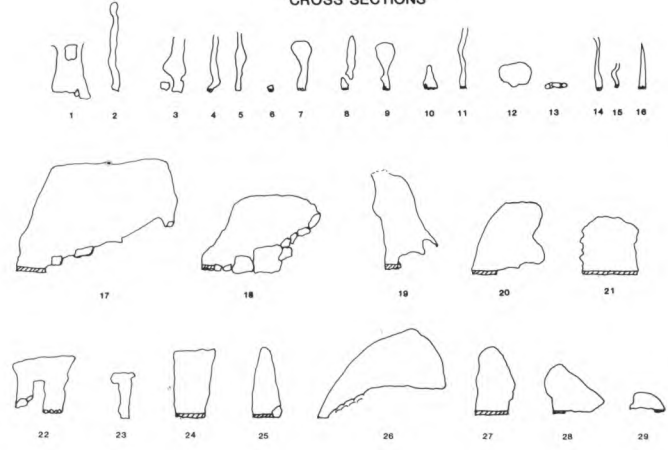


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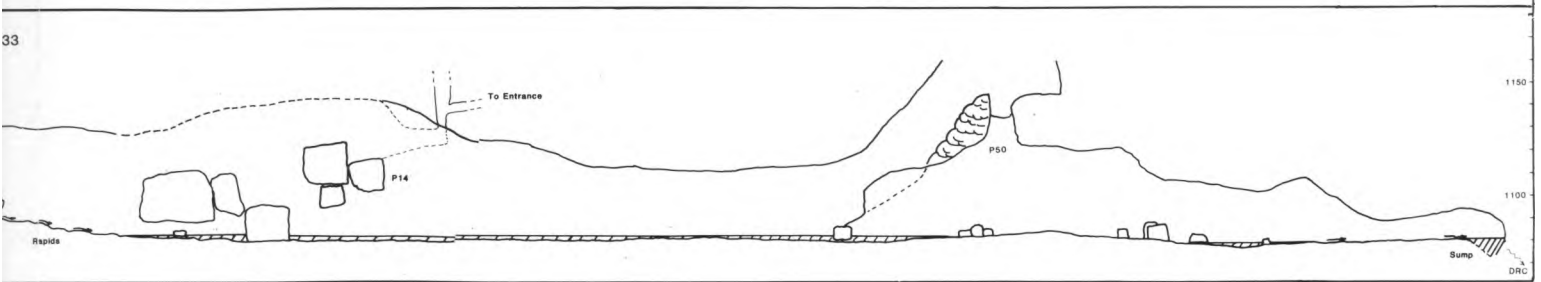
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CROSS SECTIONS



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Steve's dive was made in the centre window of three karst windows near the village of Nang Nao. Most of the folk in the area had never seen western people before let alone western people in deep cave diving gear! So cave diving as a spectator sport was finally born.

These first efforts drew a modest crowd of some 300 curious locals. This dive set the pattern that virtually all the expedition dives would eventually follow. It was made from a large surface lake with poor visibility (approximately 2m) and dropped vertically to -68m before Steve returned without having got into any definite horizontal passage. To quote Steve, "That place was enormous, I'm not talking big here, I'm talking enormous!" As well as claiming the record for the biggest audience yet seen at a cave dive Steve also set a new Chinese depth dive record.

After setting up the compressor and sorting the equipment at Duan, it was Rob and Geoff's turn to dive the following day. They chose to dive at Da Xing, a resurgence just north of the village of the same name. Obviously sensing the calibre of the divers before them the local crowd shamed the previous day's efforts and well exceeded 500. This highlighted a new challenge associated with cave diving in China, namely how to get changed in private whilst being pursued by several hundred Chinese who, as well as being interested and inquisitive, are also offended by immodest behaviour. Keen to live up to the audience's expectations Rob and Geoff equipped themselves with 200m of dive line and set off into the deep. The water temperature was a warm twenty degrees centigrade, the same as all the sites that were to be dived. However the visibility was once again a poor 3m and the water looked ominously deep. The pair dived together and immediately found themselves in a vertical shaft which, by swimming around its perimeter, was estimated to be 20m long and 15m wide. At 76m depth there was still no sign of any floor. they were at the extreme depth limits of air breathing and nitrogen narcosis was beginning to set in. They returned to the surface having laid 76m of line vertically downwards and broken the previous day's record.

Over the next two weeks the main project was to find passage between two sites, Bao An and Nong Nao, some 9km apart with a height difference of 168m. The Chinese are particularly interested in this area for hydroelectricity and water sources. The team made many dives in many different sites, encountering depth and visibility problems in all of them. At Bao An an underground sump was dived via a complicated shaft to -52m with no bottom reached. Liquid mud on the sides of the shaft blotted out all visibility at this site. At the Tisu resurgence two parts of the resurgence are accessible to divers and both were dived to impenetrable boulder chokes only a few metres wide. an extremely fast current was a problem here.

Many other sites were dived or plumbed, some plumbed in excess of 100m. The last dive made was at the same karst window as Steve had explored on the first dive of the expedition. This time three went underwater and actually got into the roof of a massive passage at 73m depth! This passage was only followed for 30m before the onset of narcosis dictated a return to base. Making rough calculations from the position of Steve's dive two weeks previously and having plumbed the shaft to -100m, it was realised that the passage must have been at least 30m high by 35m wide! Visibility was again no more than 3m and the thought of losing the line in such conditions was a frightening prospect!

Part of our commitment to the Chinese was to train two of their scientists in the art of cave diving. the two 'volunteers' proved somewhat smaller than the average western cave diver and looked rather lost in all the equipment, let alone underwater. They proved eager in the extreme and introduced a style all of their own to the sport of cave diving.

22 dives were made in all the main sites in far from ideal conditions. The visibility was generally less than 4m and the size of the passages meant that it was like diving in huge black voids. The main enemy was depth, 5 dives were made to over 75m, certainly the deepest dives in Asia. The diver was a mere speck in the roof of these awe inspiring sumps and with absolutely no back up or decompression facilities further progress was impossible. The team answered a lot of hydrological questions but posed even more. A considerable amount of surface work would be needed before a further expedition could be mounted. However it will remain undoubtedly one of the most exciting diving areas in the world.



ROB PARKER AND GEOFF CROSSLEY By Gavin Newman

MASHAN COUNTY: THE STORY OF JIN LUN

FROM: A FOLKLORE AND HISTORY OF JIN LUN, BY HONG BO.
TRANSLATED BY HU MENGJU

People don't know exactly when it started but for several hundred years the story of Jin Lun has spread far and wide among the Zhuang minority folk in the middle reaches of the Hong Shui River.

The story goes that, towards the end of the Song Dynasty (960-1279AD), Jin Lun was born in a small village near Mashan. His name meant Golden Wheel. When he was three years old he started to read the Chinese characters. He was very quick to learn. He could remember in every detail poems and stories he read only once and could recite them from memory without losing even one word. By the time he was seven years old his father's knowledge was no longer enough to teach him so his father invited a teacher. Many children from the villages around came to learn from the teacher but the house was too small for so many pupils. Jin Lun's father was embarrassed. One day Jin Lun suggested that they should all go to the big cave nearby to hold their classes.

The cave was just behind the village and as they expected, a chamber just beyond the entrance could contain several tens of people. A stream flowed out of the cave with crystal clear water which reflected the surrounding trees. It was a graceful, quiet place. The teacher said, "Good, good," again and again when he saw the surroundings. And so the cave entrance became a school.

Further inside the cave is dark and deep. One day, Jin Lun said to the teacher, "Master, we see stalactites hanging in the entrance. They look so very pretty there must be some wonderful sights inside. Could you please lead us inside to have a look?"

The teacher thought a minute. "There are green hills and clear waters on the surface, there must be a myriad of formations underground. We will go in together." Then he told the students to prepare two bamboo torches each and they ventured into the cave. After only a hundred steps along they were so excited about the infinite variety of fantastic phenomena. The further they went in, the more fascinated they became and they forgot about everything except exploring. When their first torch burnt away and they lit their second one the master said they must return

to daylight the same way as they had come in otherwise they would get lost. When they got out of the cave and counted, they found one pupil was missing. It was Jin Lun. The teacher was very worried and asked the village folk for help. They searched the cave for three days but failed to find him. So what had happened to Jin Lun? This is how it was. He was even more fascinated by the cave than the other students. He hadn't even realised he had left them. He wandered, enthralled by the stalactites of grotesque shapes. Eventually he found himself in a chamber of incredible size, he could see neither roof nor walls. It was like waking from a dream. He could not find his way out. Eventually he saw a golden shaft of sun through a small skylight. He climbed out and found himself on the hillside just behind his village.

So that is how the cave got its name.

Seven hundred years later British and Chinese speleologists returned to follow in Jin Lun's footsteps. We surveyed in from the resurgence, past a billowing red banner emblazoned with gold Chinese characters dedicated to the gods of the cave. Over subsequent days the cave unfolded a complex seven kilometres of interconnecting passages on a number of levels and with a number of entrances. Above the active streamway and the immense Jin Lun Main Chamber, calculated to be 14,000 square metres, was an extensive, richly decorated fossil system. Access to it was gained through a small, insignificant hole concealed in dense vegetation behind the village. It lead through increasingly spacious chambers eventually exiting up a steep ramp high above the river sink with a panoramic view across the gently rolling, wooded sandstone hills adjacent to the limestone towers. One of the most spectacular of the fossil passages was the Maze, fifty metres wide and up to thirty metres high and guarded by impressive stalagmites like giant flagposts. It was so named because it was almost completely blocked by stalagmites for a short distance, so creating a complex route finding problem.

Up steep climbs and in distant, inaccessible side passages, traces of ash from ancient torches were found. Remains of the search for Jin Lun? Who knows!



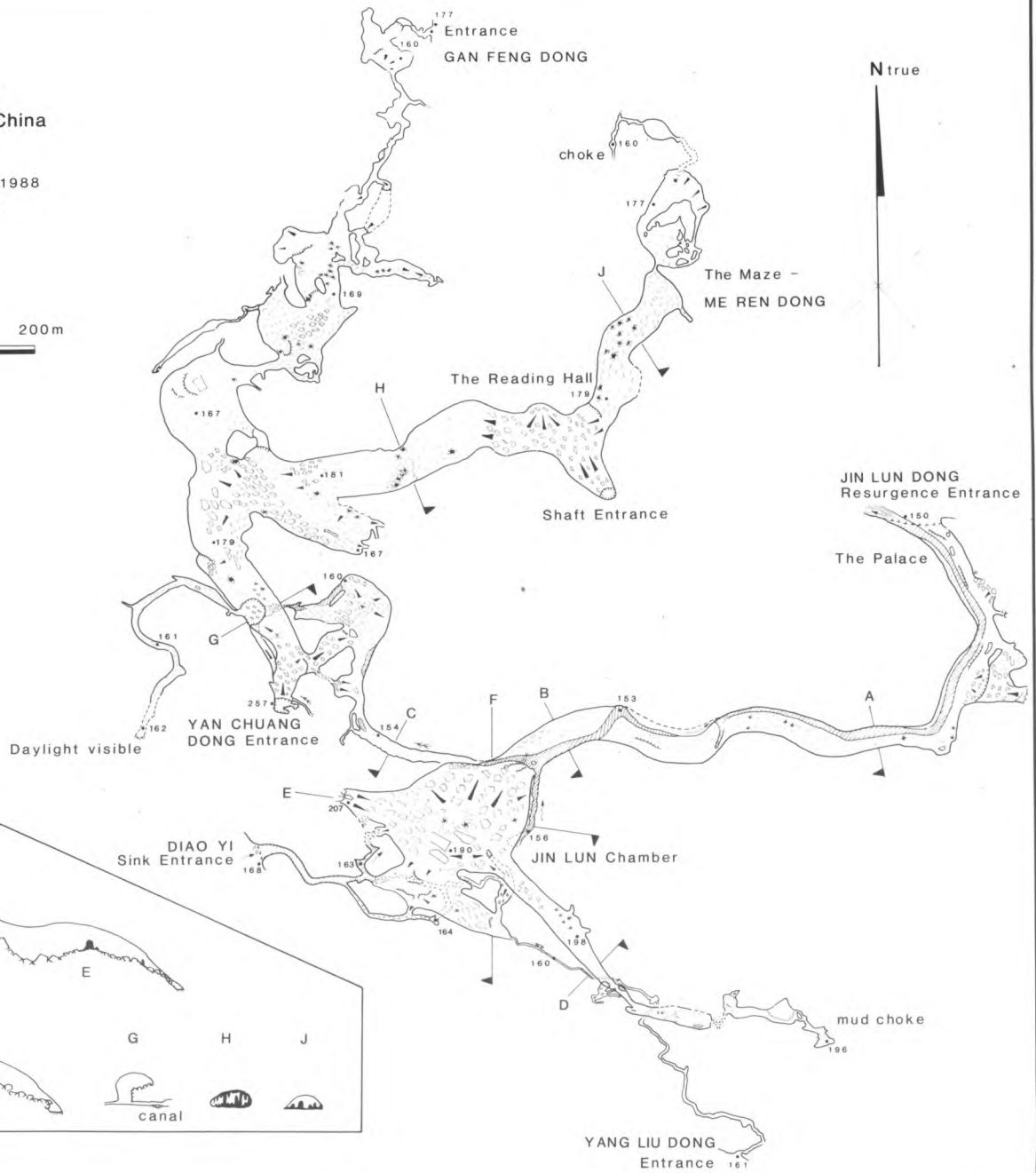
JIN LUN CAVE By Gavin Newman

JIN LUN DONG
Mashan, Guangxi, China

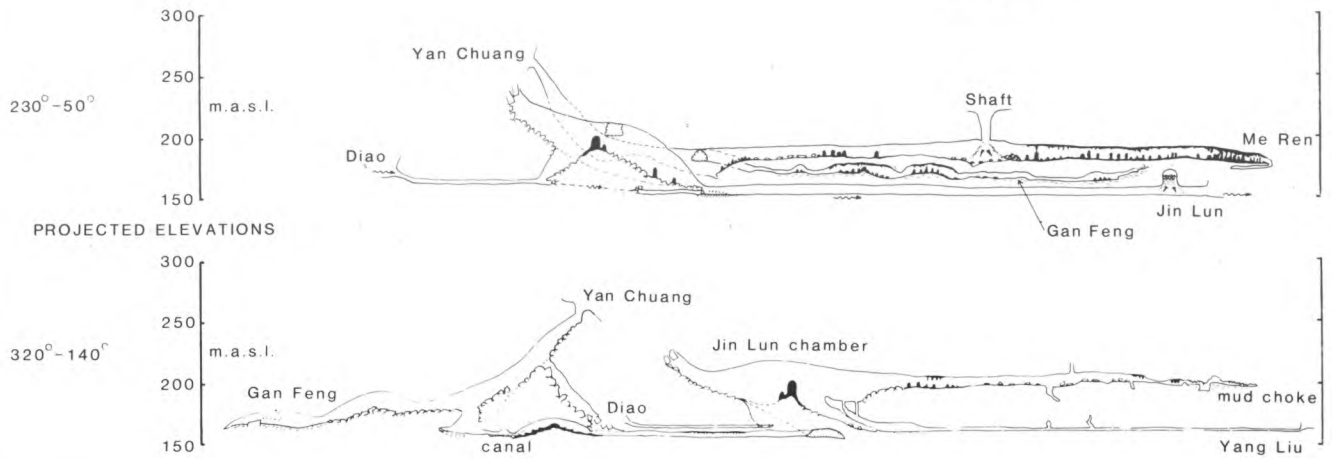
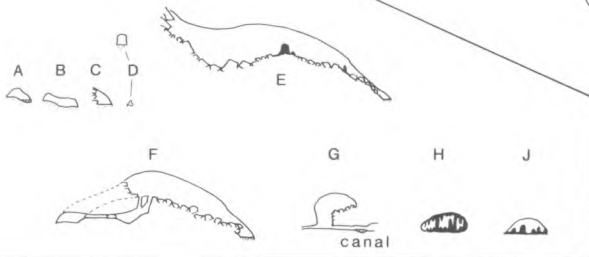
Survey by
 China Caves Project 1988
 BCRA Grade 5C



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SECTIONS



PLH

EXPLORATION OF GANG ZEI RIVER CAVE

PAMELA FOGG

The map showed a river looping in and out of limestone towers and our imagination did the rest; vast echoing chambers and sweeping streamways ready and waiting for exploration. A caver's paradise. A recce along dusty tracks past the now familiar endless stream of people constantly on the move led us to Gang Zei village and confirmed that a sizeable river was indeed sinking underground. Paul and I set about exploring and surveying it. We had no dinghy with us but were led to a small fossil entrance above the active streamway. The cave was well-known by the local people and as it was Sunday and a school holiday we were accompanied by crowds of barefooted children scuttling expertly in the darkness. Occasionally they illuminated the chambers with a brilliant burst of light from flaming bamboo torches which left a trail of charcoal and acrid smoke. The children moved en masse, scaling steep climbs with all the speed and agility of mountain goats leaving us to look plodding and over dressed. Our interpreter Zhou spoke the local dialect and was able to explain that we were drawing a map of the cave. Our self-appointed guides then stood so still and quiet that we were totally unaware of their presence until the lights from our carbides picked out their immobile shapes and bright fascinated eyes.

On that first day we surveyed nearly a kilometre through a huge chamber where the air was stiflingly hot and down along looping passages to the river flowing beneath. About one hundred metres from the resurgence and the glow of daylight the river deepened and widened. We would need a dinghy to explore further. This section of the cave was optimistically named Gang Zei One in anticipation of a lot more to come.

As this resurgence was not even marked on the map Mark and I decided to spend the next day walking the surface to ascertain the potential of the Gang Zei system. From the village we climbed a steep footpath up and over the col between the towers into an idyllic doline with the village of Li Long nestled at one side and the river emerging from underground at the other. As we hoped the river disappeared again at the base of a tower within a hundred metres. The sink looked promising, the water was deep and a strong draught indicated sizeable passage ahead. The inhabitants of the doline had now gathered and realising, if not altogether understanding, our interest in caves were keen to guide us to a small fossil entrance concealed in undergrowth above the sink.

A farmer and young lad led us into a chamber and short crawl. Suddenly Mark gave a squawk as his carbide illuminated the rearing head of snake over two metres in length. The Chinese guides in front with no lights had stepped over the ledge unaware of the slumbering serpent sheltering beneath. I gave a startled scream and retreated hurriedly backwards to a safe distance while the Chinese pounced on it shouting triumphantly and grasping it expertly by head and tail with practised skill they bore it out of the cave. Snake is worth up to one hundred yuan in the cities; perhaps as much as six months wages for these country folk. For the remainder of the day we looked rather more carefully where we were placing our feet.

We returned the next day with a dinghy and with Gavin, having fired his imagination with tales of howling draughts and cave passage romping off into the hillside. Creating considerable interest we launched the dingy at Gang Zei and paddled off through the already explored GZ 1 to Li Long; it was much quicker than walking over the top. Arriving at the sink it didn't look nearly as promising as it had the previous day. The draught wasn't quite so billowing



THE WALK TO FENG DONG By Jerry Woolldridge



BEN LYON INFLATES THE DINGHY By Jerry Woolldridge

and now we noticed that the roof sloped down at an angle perfect for creating a sump just beyond daylight. Gavin looked accusingly at me as we paddled in leaving Mark standing at the entrance with one end of the tape measure and a hoard of children. The air was still. Suddenly from the darkness ahead came a mad crashing and flapping. My first thought was that there surely couldn't be a bat that size. It wheeled and crashed around our cowering heads then glided towards daylight swooping over Mark and the line of enthusiastic locals who were whooping with delight. It was a large owl, rudely awakened.

With a few more pulls on the oars the draught reappeared and thankfully the roof started to lift; the passage was continuing. As if to echo our relief, fire crackers were let off at the entrance. The explosions echoed and reverberated along the walls with ear splitting effect.

We surveyed on along the streamway until we saw to our surprise, a shaft of sun ahead; surely we couldn't be at the resurgence already. It turned out to be a spectacular skylight high in the roof of a dry side passage leading away from the river. The walls were green and lush, festooned with ferns and creepers. We followed the passage to deep water and built a cairn presuming that this dry route was merely cutting a corner and that we would meet the cairn

when we resumed surveying the streamway from the dingy. We met the resurgence before we met the cairn conclusively disproving our theory! Puzzled and intrigued we hurriedly paddled back to the skylight passage and cairn. The water we had reached turned out to be a deep pool with a delicate layer of calcite crystals floating on the top.

With time against us we surveyed on rapidly in 50 metre lengths, the limit of our tape measure. The dimensions of the cave were steadily increasing all the while. By now we were confident that we were, without doubt, somewhere the Chinese had not been. Suddenly we were met with the sight of a short stretch of pathway about ten metres long marked by a line of stones on either side. At first we persuaded ourselves that it was a natural phenomenon caused by floodwater, however on closer examination Mark noted that it led to the base of an immense stalagmite. There were distinct signs of steps leading up, as if to the top of an altar from which there were clear views up and down the passage; a perfect vantage point but for what and why? Puzzling this we hurried on and were met with the totally unexpected sight of a large slow moving river flowing along a vast passage. Where did this river fit into the overall picture?

Frustratingly, time dictated that this mystery must wait unanswered until the following day. The next morning Gavin and Mark returned to investigate the enigma while Tim and I moved on to Gang Zei 3 to follow the river as it sank underground for the third time. We paddled in surveying as we went, Tim leaving me perched vulnerably on minute ledges clutching the end of the tape measure. After three hundred metres of sweeping streamway we met a dry side route leading to an immense chamber and in the distance the sound of familiar voices; it was Gavin and Mark and the mystery was solved. The river looped and meandered underground so much that yesterday's skylight passage allowed a direct link to be made between sections 2 and 3 without needing to emerge to daylight at all. Now we joined forces and surveyed on. In the distance we heard the sound of fast flowing water. After a few more bends the river proceeded to drop down over a series of drowned gour pools culminating in a two metre waterfall framed on either side by cascades of gleaming flowstone. The streamway continued. We had no idea exactly where we were going to emerge or indeed whether we would be able to emerge at all, perhaps our way on would be blocked by a sump or boulder choke and we would be forced to turn back. Our compass readings told us we were heading due south in the direction of a resurgence at the village of Long Zhuan.

We paddled under an area of major collapse with boulders the size of buses balanced delicately above our heads. We guessed that this corresponded with an enormous fossil entrance overlooking Long Zhuan. The draught was still in evidence but we realised now that perhaps it was coming from the boulder choke above and not from the resurgence as we had hoped. Our fears of a sump increased as the roof started to slope down and the passage narrowed so much that there was only just room for the dinghy to pass through. Branches and twigs festooned the muddied walls and roof. The air became still. Pendants of rock split the river into a maze of narrow canals. Just as a long journey back was seeming inevitable the draught reappeared this time smelling fresh and cool, the roof rose, the passage widened and Gavin, swimming ahead, shouted that he could see a hint of daylight. Two hundred metres more, a few sharp bends and we saw



FENG DONG – THE BLOWING HOLE By Jerry Wooldridge



THE DINGHY IN THE SOLUE RESURGENCE By Jerry Wooldridge

daylight silhouetting tall bamboos; it was the Long Zhuan resurgence. We had completed a classic through trip.

Gang Zei 4,5 and 6, although shorter, also produced their surprises. Mark and Tim decided to explore 4 without the dinghy and swam their way through treading water and gripping the tape in their teeth as they drew up their survey notes. As they were thus involved a bamboo boat suddenly appeared out of the darkness punted along by a lone fisherman. He used no light, probably confident that the cave could produce no surprises. If he was startled by the sight of two bobbing white faces with flames coming out the top he did not show it but managed a civil, Ni Hao, (good day) as he glided serenely past.

The Gang Zei system produced over 7 kilometres of stunning cave passage and some memorable moments of exploration.

THE CAVES OF BAMA COUNTY THE PAN YANG CAVE SYSTEM

BEN LYON

Bama County is one of the most remote areas which the China Caves Project has worked in, being three bone-shaking days by bus or jeep from Guilin. It lies to the south west of the Hongshui River as it bends southwards after having left Yunnan for Guangxi Province. The landscape is dominated by vast areas of tower karst of the continuous Fengcong variety rather than the more mature discontinuous Fenglin, with tower tops rising to between 800 and 1000 metres from a local base level of around 300 metres. The blocks of limestone are split by intervening overlying sandstones and shales, which form important surface run off catchment areas, and from which has come the non-calcareous material which floors the dolines between the towers.

Before the arrival of the main group, Dave Gill had spent a week travelling around looking at the possibilities with Lian, a postgraduate student from the Karst Institute in Guilin. They had earmarked half a dozen promising sites, including the giant river of Solue, which had already been surveyed for 4.2 kilometres to a sump by the Chinese. Something new seemed more inviting than something old, so the morning after our arrival Dave took us to Beimo.

Bumping north from Bama town the dirt road more or less followed a river valley, with sandstone hills to the west and across the river the saw-tooth skyline of tower country. After travelling for an hour the river came to an abrupt head, issuing from deep turquoise resurgences just by Beimo village. The biggest resurgence seemed to be draining the limestones to the east, while a very inferior spring entered the river from a cirque in the hillside to the north. The total flow of the river was difficult to judge but it was probably between 4 and 8 cumecs. It did not fall appreciably during the three weeks we were there, although no significant rain fell.

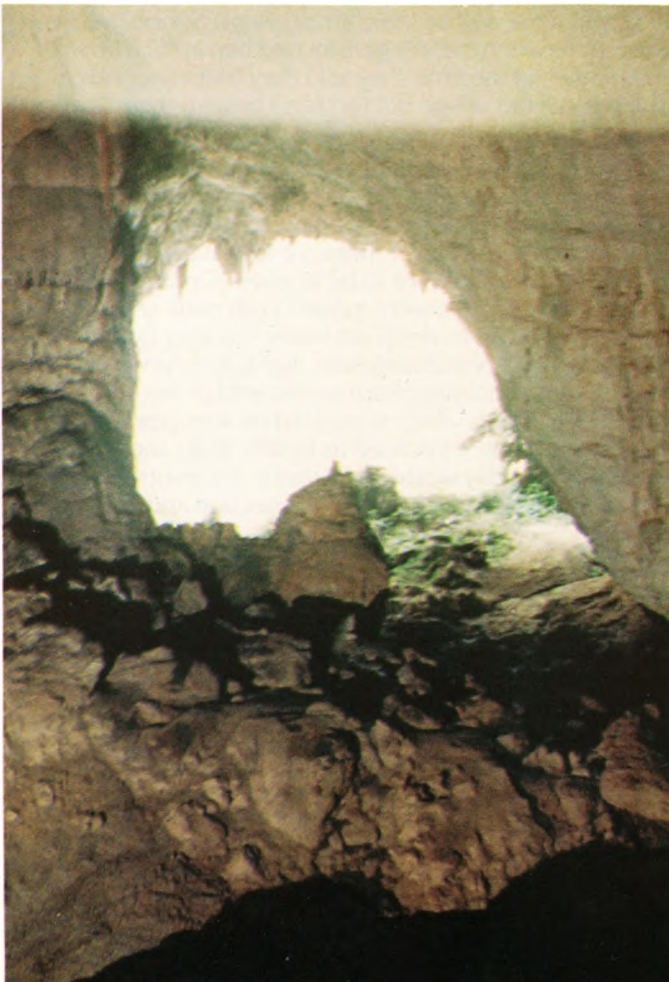
That first morning we decided to leave the main rising for another day as it was clearly a swimming job right from the start. (In fact when we did go back to it there was massive loss of face when, after performing 'The Dinghy Inflating Ceremony' in front of a crowd of hundreds, followed by 'The Procession' across paddy fields for 'The Launching', our intrepid party equipped for the Styx itself, did not even get out of daylight before bumping into a very terminal wall!) The attraction of the bay behind the smaller rising was big and immediate, a zonking great arched entrance just waiting to be explored. Not that we could claim it as a new discovery though, because the ant like figures coming out of it were soon revealed to be the locals who clearly used the cave as a regular through route.

We had barely got into the cave before Jerry started to get his cameras out. The stalagmite bosses were superb and big. While I posed by one nearby, Dave and Mike climbed up a ramp, still in daylight, to provide scale to the picture. Within a flash they were gone.... up to a higher level of the cave a hundred metres above. Here they found massive defensive stone walls and in the darkness behind enormous but beautiful calcite formations, great stalagmite bosses, other 'mites' which were almost two dimensional, formed along the line of wind blown drips with upturned stone fronds and cave pearls everywhere.

Down below the faint glow of daylight could be seen through a low (only 40 metres high!) arch. The locals' path went through the dark section strewn with the remains of bamboo torches and on to exit via a three hundred foot high portal into what was obviously a collapsed chamber. The path went on to a cleft in one corner where it continued up a natural stairwell to the green floor of the



REVERSE DRAUGHT – DRIP FORMATIONS – BEIMO 1 CAVE
By Jerry Wooldridge



CLOUD IN ENTRANCE CHAMBER BEIMO 2 By Jerry Wooldridge

doline above. Our cave continued at the far side of the 'window'.

Into the mountain and directly underneath a tower lay a big chamber with a massive slope beyond and a smaller mud floored passage to one side. The route up the big slope led through guardian stalagmite sentinels to Dave's 'really enormous' chamber. The view back was something else. Warm air ponded up in the heights of the first chamber to become layers of ethereal cloud, subtly changing all the time. Unfortunately perhaps, the cloud tended to obscure the view in Dave's chamber which, when clear, must be spectacular. Beyond here a run-in slope led up to dry stone walling more massive than anything in the Yorkshire Dales and to an insignificant entrance in the side of a long elongated doline. We also reached the doline by a second route through the mountain, this one popping out almost directly above a river sink. In both cases the end result was the same. We emerged to see, across a few hundred metres of shake hole cratered doline floor, an absolutely superb hole in the side of the mountain too big to be dismissed as a mere 'entrance'. Qian Dong lived up to its promise. As Mike Meredith strolled into its airy interior with the end of the 50 metres tape he muttered, "If these caves get any bigger I'll be out of a job!"

We had been in caves of this size in Mulu (Gunong Mulu National Park Sarawak, Malaysia) and Mike's job is now to develop them using the power of the slogan 'World's Largest Caves'. Perhaps he would have to prefix this with 'some of', to the dismay of his employers! This vast tunnel was laughingly easy. The main line survey through 600 metres of cave to a collapse 'window' took all of twenty minutes. The cave continued beyond, even bigger and a bit more complicated, with a shaft down to water and a ramp leading up to goodness knows where but still mainlining northwards to come out in the south side of a second major doline. Straight ahead lay a village and behind it the continuation of our cave, big enough to gobble up the entire village with room to spare!

We were now several days and several kilometres into our explorations and things were obviously getting complicated. Our road from Bama fortunately continued on a parallel northern track to that of the caves but a few kilometres away to the west on the flanks of the sandstone mountains which drained down into the dolines between the caves. As the caves went further we got dropped by the Karst Institute jeep at an increasing distance and time from Bama. To have to spend an hour and a half on the road was, when doubled by the return journey, eating into the caving time at an alarming rate despite not getting back until 8pm and to a meal that had been quietly dying for two hours. More manpower was obviously needed so we telephoned Tim in Duan for help, which arrived in the form of Simon and Charlotte, accompanied by five journalists!

Stopping to point Simon, Charlotte and assorted journalists up the ramp in Qian Dong, we pressed on northwards.

"What are these caves called?", we asked the locals in the village we had seen. "Well they say the cave we've come through is called The Cave in Front" (Qian Dong). "And the one on the far side? "That's called 'The Cave Behind!' (Hou Dong). "Bloody Hell," mumbled Dave, as we scrambled towards the huge void, "one of the biggest caves in the world and it's called the Cave Behind!"

Dulled as we were by the hugeness of caves already seen, we were still dumbfounded by this one. Inside the entrance it got bigger until on turning a corner (which on closer inspection turned out to be a stalagmite pillar as big as a tower block) the dimensions gently expanded to give a square roofed, walled and floored gallery, each side over

90 metres long, overlooked by a stalagmite perched on boulders, its top some seventy metres above. Our first visit ended down a muddy gully at the edge of a drop. Next time we found a slope which bypassed this and got down to a deep lake, obviously at its low dry-season level, while the top of the slope led on past the ubiquitous stalagmite bosses into the continuation of the entrance passage. Caverns measureless finally ended in a traverse which intimidated the old man team and in speculation that the way on must be above an overhanging wall of muddy calcite. It would have to be tackled, but how?

Meanwhile we kept throwing crumbs to Simon and Charlotte and they kept transforming them into crackers. The one enterprising journalist who got to the top of the ramp said afterwards that he was bored and did not see the attraction of caving. Our cavers reported that the ramp was long, steep and scary. It led to an old higher level route which proceeded through a series of chokes and chambers to the outside world – at both ends of the mountain! Strange to say, it had been investigated by cave scientists, but neither the locals nor our Chinese speleologists could throw any light on the subject.

Rectangular pits up to 7 metres deep had been dug into the floor sediments at regular intervals, beautiful neat jobs with survey marks painted in red nearby. From this fossil gallery we then suggested that the dynamic duo should proceed to a dry sink we had ignored on our way past from the road to the Cave Behind. This 'went' until it finally emerged behind the village which was reached through the window in Qian Dong.

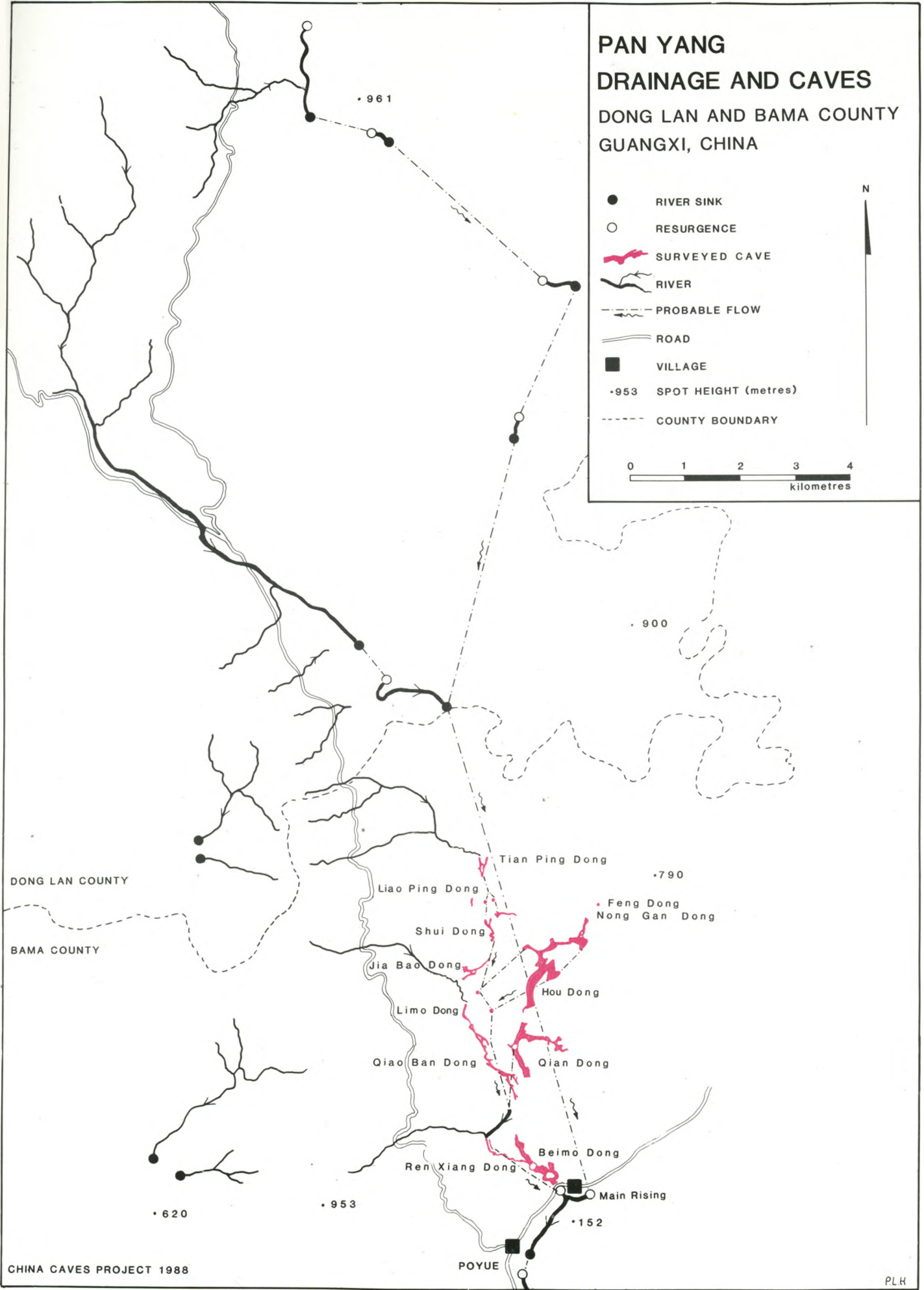
Sounds confusing? Well it was, we had so many caves and dolines that we found it difficult to know where we were ourselves at times! To backtrack and sort this one out... There was a track through Qian Dong which branched sideways in the collapse window halfway through into a small cave at the side. It was only 18 metres long and led into a beautiful hollow which was surrounded by towers and contained a well ordered small village. Simon had been there before when the villagers invited him in for a bowl of boiled water. At the time they said they had a second cave at the back of the village but he didn't believe them!

Could this second cave also be pushed right through the mountain? It continued on past the entrance leading to the village and Mike and I had followed a high level route above a sumped resurgence pool which went in the right direction to meet it. Well, if there is ever a Bama caving club, its motto would have to be 'It goes'. On the appointed day, parties went in from both ends and descended pitches to deep still water. Contact by shouting was established immediately with highly satisfying booming noises echoing from end to end of the half kilometres of canals which separated us. Rob (some of the diving team having reinforced us by this time) and Simon spent a glorious day sloshing around in the magnificent epi-phrears to make the physical connection and find more besides.

Meanwhile...back at the Cave Behind, we kept quizzing the locals for more information. This was difficult because we had to work through a Chinese interpreter with only a moderate grasp of English, compounded by the fact that the villagers belonged to the minority Yao people and spoke very little Chinese. However we did manage to gather that sometimes, many years ago, a party had managed to get through the cave to come out at a village called Nong Gan. It had taken the explorers two days to do the 7 kilometre journey. the walk on the surface to the village was described as long and difficult. Well, maybe it was all just a legend but we thought it might be worth testing, especially after we found an area on a slope a long way into the cave which had been levelled out to serve as sleeping places.

**PAN YANG
DRAINAGE AND CAVES
DONG LAN AND BAMA COUNTY
GUANGXI, CHINA**

- RIVER SINK
- RESURGENCE
- SURVEYED CAVE
- RIVER
- - - PROBABLE FLOW
- ROAD
- VILLAGE
- 953 SPOT HEIGHT (metres)
- - - COUNTY BOUNDARY



CHINA CAVES PROJECT 1988

PLH

Inside the Cave Behind Dave and I managed to climb half way up the calcite slope which blocked the way on. We then 'gave' this to Rob, who was clearly more fitted to the task than us, while we planned a trip into the mountains to search for the lost village. The first recce was on a glorious day marred only by a rather overwhelming pressure of journalists. A stroll through the towers led downwards to a village in a complicated line of dolines. At its lowest point there was an amazing collection of entrances. Three went down for about 70 metres to unite at the level of the phreas – the local water holes. Off the sides of the same hollow were four other entrances which led into two separate caves. It was too far away from Bama to do much here in a day so the nettle had to be grasped. We asked our Chinese hosts if we could bivouac for a night. The very next day we were back with sleeping bags, bottles of beer, sticky cakes and peanuts. The caves were quite interesting, trending southwards, and one of them becoming large and complex before descending a 40 metre pitch to a terminal lake.

The bivouac was notable for the reaction of our Chinese companions, Lian and Cui. It was very much a first experience for Lian and, though Cui said he had slept out on a beach once, their excitement reminded me of kids on their first camp! The echoes of 'Ten Green Bottles' sung with oriental accents must have been the wierdest thing the villagers had ever experienced.

The next morning we resolved to try to find the 'lost' village behind the Cave Behind. We continued into the hills, contouring the tower slopes past houses with only a fraction of an acre of field for cultivation, towards a col. The local schoolmaster said beyond it there were lots of caves, including one with a wind which would "blow your clothes off!" The first thing of note was the most enormous doline right down to our right, descending hundreds of metres into a jungle clad hole. Then right by the track we hit Feng Dong, the 'Blow your clothes off' hole. No doubt about it. The wind fairly howled up and out of the 2 by 3 metre inclined shaft. Sticks thrown in were blown straight back out again. The blasting hot air condensed and produced a permanent rain shower over the entrance. Without much rope it could not be descended that day but Dave did get down a surprising distance on our 8 metre rope. Then we had to investigate the doline.

Down past a village of two or three huts and into a vast depression which in turn led to a second deeper depression at its base. This had a rock wall of 400 metres overhanging one side, with cliffs nearly ringing it entirely. However, a crafty scramble got us down to a large scree which went right to the bottom. Although there was evidence of man's former presence this was the nearest that we had come to untouched vegetation anywhere. The progress, bashing and crashing down was so difficult and the scenery so spectacular that Dave started comparing it to Nare in New Britain.

When we finally reached the cave at the bottom it was rather small – only 15-20 metres wide, and leading through waist deep water to a very terminal choke. We started surveying out. There was just one side passage. Dave had a look and said it went to a bit of a climb. It didn't look promising. Then we thought we heard something. We shouted, there was a shout back. The next minute Steve appeared at the top of the climb, slithered down it and slightly incredulous joy was unconfined! Not only had we found the other end of the cave but we had done so from

both directions, at the same time and on the same day. An almost incredible coincidence.

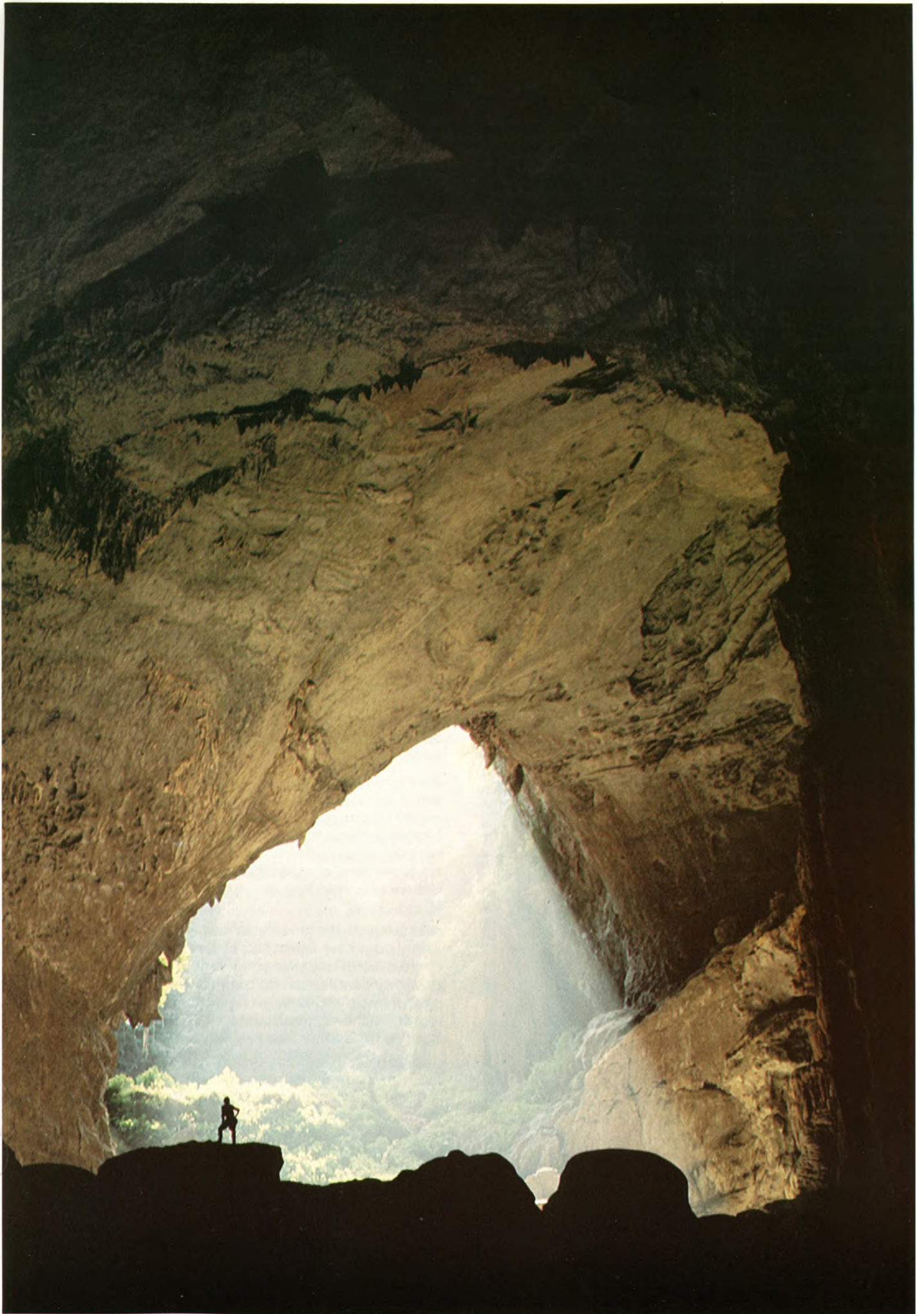
From the other end, the caving team had climbed up the huge fossil gallery which came to second ascent up flowstone to a continuation. Around here the passage was estimated to be over 200 metres high. Further on there was a ramp, not just any old ramp, but a real mega-ramp which went down, down and down in a huge passage before finally fizzling out some 140 metres below the top in a small sump. It was on the second visit to this area that Steve discovered a most unlikely dry shaft in a corner not far from the top of the ramp. It dropped down 28 metres to a short passage which was our meeting point. And what of our local information? We knew that the cave had been traversed in recent years and one man said that his grandfather had been in the party that did it. Well it wasn't 7 kilometres but everything else was dead right. In the high galleries, with pitches to climb up from both directions, there were the remains of flaming torches – even a bundle of firewood and, perched on the lip of the final pitch down, a porcelain spoon.

Dave, who was due to leave Bama the following morning, switched parties and did the first complete through trip. We continued to find and survey other caves which fitted into the jigsaw and ended our stay by having a mass bivouac in the cave entrance at the far end of our system. We derigged en route to give us enough rope to tackle the blowing hole the following day. Or so we thought. It didn't. Geoff and Rob ran out of rope at 120 metres depth. From here, stones dropped and timed took twenty seconds to rattle and ricochet on down to the bottom. From this, and the elevation of the entrance, they estimated the shaft to be 330 metres deep.

Our schoolmaster took Andy, Mike and myself into a cave in the next doline along which must be somewhere over the Ramp. We passed by an entrance maybe 90 metres in diameter. Andy went down the hill to an even bigger one. Our friend told us that if we wanted to see a big cave we would have to go over into yet another doline. The mind boggles!

All through our explorations we were hampered by lack of maps. The 1:50000 sheet we had access to ended a kilometre north of the entrance to the Cave Behind. Without maps all we knew was that there was an angry ocean of tower karst disappearing into the distance. It was only when we got back to the Hydrogeological Team at Liuzhou that we were able to look at the northwards extension of our cave area. It was quite mindblowing. A large river drained off the sandstone 15 or more kilometres to the north west, with indications that caves went through in that direction and also more directly northwards. (Only when we saw a map of Guangxi Province on the wall of the Holiday Inn in Guilin the day before we flew back did we get confirmation that another big river did indeed flow into our karst area from the north.)

Cave exploration is always a venture into the unknown. Our trip into the cave system behind Beimo, coupled with the topographical information we now have, indicated that the 16 kilometres of huge cave which we surveyed are but the beginning of a vast network which could run through three counties and become not only one of the world's biggest but also the longest cave system with a 300 metre plus shaft thrown in for good measure!



SKYLIGHT BETWEEN QUIAN DONG 1 & 2 By Jerry Wooldridge

CAVE BIOLOGY

SIMON FOWLER

Fortunately for most cavers the majority of cave animals are small, inconspicuous and completely harmless! Usually they are small, relying on low and intermittent supplies of organic food from outside the cave. Organic material may be brought in by floodwater, slow seeps or drips or by biological means. An example of the latter are the heaps of excrement under large bat colonies in tropical and sub-tropical caves. Large bat colonies have existed in Guangxi in the past, producing the phosphate deposits that the Chinese now mine. The largest bat colony that we found numbered only one hundred and guano deposits were sparse. Without the large organic inputs from bat or swiftlet guano it is not surprising that the cave fauna was correspondingly sparse in numbers.

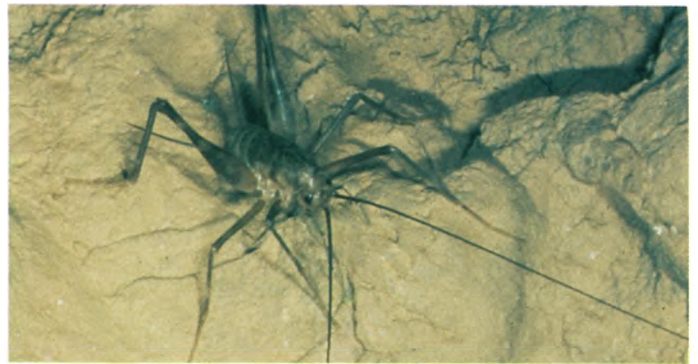
This was an extensive study, meaning that we didn't sample intensively anywhere but rather we collected a little at a lot of sites.

Collection techniques were visual (you collect what you see) involving plenty of crawling in mud to spot the smallest creatures or fast reactions to catch the cave crickets or giant centipedes. Both these species are equipped with hugely elongated antennae to detect predators and prey in the dark. The centipedes also possess large poison fangs demanding considerable respect.

Although there were very few bats or other terrestrial vertebrates, terrestrial invertebrates were found in all the caves. These included a range of detritivores which feed on organic waste, and scavengers, consisting of two species of blind white woodlice, four species of blind white millipedes and two species of rhabdophorid crickets. These two species of cave cricket were rarely found together. Rather satisfyingly the pigmented, eyed species was most common near the cave entrances whereas the blind white species was restricted to sites further in the caves. Several species of flies were seen but then skillfully eluded capture. These animals are preyed upon by a variety of predators. The webs of small spiders adorn the pagoda stalagmites. 25 centimetre scutigera centipedes race around the cave walls presumably chasing the cave crickets and other large detritivores, and frequently terrifying unwary cavers! Various other spiders were caught including a blind species. A lone individual of a blind carabid beetle was discovered running over a steep mud slope at the edge of an unexplored pitch. The acrobatics necessary to capture the fleeing beetle nearly resulted in the rapid exploration of the pitch!

The aquatic sites were not conducive to cave faunal studies. In Bama they were insufficiently isolated from surface rivers to contain a cave adapted fauna. In Duan most sites were one hundred metre windows into the phreatic, the submerged cave passage, too deep for air-breathing divers let alone cave biologists!

Of particular interest in this study was the effect of human activities on the cave fauna. Perhaps the largest influence is the indirect effect of the deforestation in the region. We found only one small deep doline that was inaccessible enough for forest to be preserved. More direct effects result from the various ways the Chinese use their caves; prospecting and mining for phosphate, as thoroughfares for humans and animals, as show caves and for supplying water. The only show cave investigated, Jin Lun at Mashan, had an apparently normal fauna suggesting that this form of use of caves had little effect. The very popular Reed Flute Cave at Guilin might have presented a less favourable picture but was not investigated. Nearly all



BUGS ALL By Simon Fowler

the high level fossil caves have been entered at some stage, presumably in search of phosphate, but these explorations appear to have done very "Little" physical or biological damage. Several sites were used for local water supplies often involving the construction of steps and so on, however these modifications were always close to entrances and so interfered little with the cave fauna we found.

In contrast, the caves used as regular thoroughfares had a very poor cave fauna. Use by farm animals is particularly destructive. These sites were, however, normally very large draughty caves which do not provide good habitats for cave animals. Similarly, mining for phosphate will only be worthwhile in dry fossil passages where leaching has not occurred and these also provide poor habitats.

Ideal habitats for terrestrial cave invertebrates are usually found in draught free passages with high humidity/standing water and plenty of mud provided by regular but not severe flooding. Naturally these passages are of little appeal as show caves, thoroughfares or as sources of phosphate.

To summarize, we found a sparse fauna of terrestrial invertebrates but with a high proportion of cave-adapted species. There were no swiftlets and very low populations of insectivorous bats. There were no fruit bats. The local deforestation has probably contributed to this, but also the climate is cool in winter considering the sub-tropical latitude. There is extensive human use of the caves but the best sites for cave animals are relatively unaffected.

CAVE ARCHAEOLOGY

CHARLOTTE ROBERTS

After being briefed to observe and assess the potential for cave archaeology in the caves of Guangxi in China it came as no surprise to find an abundance of evidence of earlier populations using the caves for a variety of objectives. This use stretches right up to the present day.

Particularly exciting was the day we visited Gan Fang or Monk's Cave in Duan County. We had been told by local people that this cave had been used by monks for hundreds of years. We hoped that it was going to be worth the effort of the long hazardous mountain drive, steep descent towards an impressive doline and then finally a climb up to the cave. The cave was reached by fighting through thick vegetation but the site afforded an incredible view down towards the doline. Although not very big, "higher than long" as one member of our party commented, the cave revealed extensive evidence for temporary occupation although for what purposes is unknown at present. Large dry stone walls terraced the inside of the cave into two platforms. The uppermost platform had three areas where evidence of burning at regular intervals was observed, and scatters of pottery and small bones suggested that some form of meal, ritual or otherwise, had taken place. Fragments of clothes and bunches of burnt sticks (the local people's method of lighting in caves) betrayed evidence of human use but of what date is difficult to say. Palaeomagnetic dating of the hearths will perhaps give us clearer ideas on the date and use of Gan Fang Cave.

In Beimo 1, Bama County, we came across further evidence of dry stone walling but this time much more elaborate and extensive. There was clearly a real purpose to these walls, in this case defensive. Again it was difficult to date these constructions. Cave environments usually preserve man made structures extremely well so without reliable dateable evidence the period of time when these structures were built and used can only be surmised. Their establishment may well have been precipitated by the uprisings of the Cultural Revolution or they may well be many hundreds of years old. What is certain is that they provided more than adequate defence. The upper levels of Beimo 1 became inaccessible once walls had been built and the view down to the river below from one particular vantage point was extensive. The walls were up to 5m high and over 25m long at one entrance to the cave with evidence of later, more recent, brick insertions with holes left, presumably for guns. The amount of labour which must have been put into these constructions is incomprehensible. This type of archaeological evidence was found consistently in all the caves we visited in Bama County. In many cases there were associated circular dry stone structures around 2 metres in diameter and in one instance a carved stone mortar had been left. These mortars are used locally by the villagers for grinding purposes.

But it is not only past populations who used the caves. Even today the local villagers use some of them as through routes to markets and schools. Another site we visited was also being currently used. The entrance to Gougin cave in Bama County was completely walled off, again by dry stone walling, and the wooden door in the centre of this wall was padlocked. On entering the cave, there was a perfectly functional forge and living quarters, even a bicycle, for a local man who apparently made metal tools there.

Use of the caves by people does not stop at their death. In many instances, entrances to caves were found to have circular earthen burial mounds enclosed by dry stone

walling. These burials ranged from very recent (identified by white flags flying – a sign of mourning) to extremely old. Some burials were observed in large earthenware pots, one body to one pot. This method of burial is rarely seen in the Western style of burial traditions. The only type of burial in pots seen in ancient Britain is the cremation type. Interestingly, in the cave areas which we visited there was little obvious evidence for burial anywhere else except in caves, presumably because of their availability.

The local people in Guangxi Province in China have had a long association with their caves and there is surprisingly little damage to any of the caves which we visited. That this is the case makes the potential for cave archaeology in China exceptional. Whilst cavers use caves for sport, certainly in the Western World, people in China, past and present, have a much more intimate understanding of their caves. They are in many respects necessary for life and death themselves.



NITRATE MINERS IN FALA RIVER CAVE, GUIZHOU By Andy Eavis



HUMAN BURIAL POT IN GUANGXI By Tim Fogg

FOOD, DRINK, SUSTENANCE AND SATISFACTION

JOHN FRANKLAND

Chinese nosh is legendary and memorable. We were constantly offered excellent hospitality and more than adequate nutrition, but it was inexorably different from Western food.

Napoleon's armies and expeditions marched on their stomachs so food is vital for achievements.

Our negotiated arrangements included a person per day payment for feeding (plus accommodation, transport and general hospitality) so that we were totally spared the logistic hassle of planning and shipping food which preoccupies so many ventures.

The nature of our business demanded early breakfasts, packed lunches and an evening meal adequate for the extremely hungry. Breakfasts were generally fried eggs, nuts, noodles and steamed buns washed down with bowls of hot goat's milk or soya milk. For a lunch which was to survive perhaps four hours of transportation underground, boiled eggs, fruit, more peanuts and spam sufficed and helped those of us who needed to lose weight. Evening meals were epic. Variety was the norm with an average of around six dishes served plus rice in profusion (eaten afterwards as a filler by the Chinese) plus green vegetables and noodles. The latter two were cooked in a circular dish surrounding a charcoal burner which sat in the middle of the table; a method of cooking common in south west China. One added these and any other choice morsels to boil in the clear liquid until they were cooked. Then they were fished out with chopsticks. Chopsticks were, of necessity, quickly mastered. We saw no knives or forks from the moment we stepped off the plane at Guilin.

Other regular evening meal standbys would be an omelette variation, nuts, chopped beef, which may well have been water buffalo, bean curd in several forms, chicken chopped but none wasted so that head and feet were offered, sliced roast pork, the variations were endless. Permutations on these came from flavouring with spring onions, peppers, chillis and other nameless species. Special meals would include duck and fish, always served whole and unfileted and sometimes highly glazed and dressed.

Banquets were special and could be amongst the gastronomic memories of a lifetime. Ten courses at Luizhou. Service like at a Western Hilton and Nouveau Cuisine starters, woodcock soup, turtle, and many other subtle dishes so that the whole was outstanding.

Earlier expeditions of the China Caves Project had convinced our hosts that cavers appreciate beer each evening. Often the "Chinese Wine" was also produced. It well exceeded the percentage alcohol possible by fermentation so was inappropriately named. It was strong, like eau de vie, and if it was pale green was coloured and flavoured by lizards. During the course of a meal the Chinese would suddenly offer the toast "gambei!" which was stand and drain your glass. We inevitably responded and generally survived. There is no drinking water apart from that boiled and served in thermos flasks to make a refreshing green tea.

The southern Chinese shop in markets which are the complete opposite to the European or American hypermarket. To wander through these makes the foreigner aware of the subtleties of their diet. Sacks of herbs, fungi, spices and seaweeds are next to dried fish, live fish, birds eggs and recognisable fresh meat. Opposite will be the bizarre snakes, horrifically fierce looking skinned dogs, turtles and armadillo. The ultimate are mummified shrivelled monkeys and the dried dragon like creatures of the herbalists. It makes our traditional diet seem rather conservative.



FABULOUS CHINESE FOOD – Edible stork as centre piece for a banquet
By John Frankland



BAMA MARKET By Jerry Wooldridge

FROM THE XINHUA NEWS AGENCY, NANNING, 4 FEBRUARY 1988

NEWS FEATURE

FLUTE – SYMBOL OF SINO-BRITISH FRIENDSHIP.

A flute became a symbol of friendship as a British cave exploration team wound up its expedition here in a night of exuberant songs.

The flute was a gift to Wei Yaoxiang, 38, director of a cultural troupe from team leader Timothy Fogg, 39, who left China for home on January 27.

The expedition team explored several karst caves in south China's Guangxi Zhuang autonomous region at the invitation of the Chinese Ministry of Geology and Minerals.

In Marsan county, Fogg and his wife Pam, and four colleagues, visited the Jin Lun Cave, 23 kilometres south of the county seat. County officials provided a jeep, cooks and food. A deputy county magistrate accompanied them. Although part of the cave is open to tourists, no map was available. The team set out to draft one and in ten days discovered seven outlets in the seven kilometre cave. They presented their map to the Mashan County Government and in gratitude the government held a soiree for them.

The county's cultural troupe led by Wei Yaoxiang performed songs and dances in the styles of local Zhuang and Yao nationality people.

Fogg reciprocated by performing with his short British flute, folk tunes "Mermaid" and "Waves". After singing the British song "Farewell", he invited Wei to join him in a flute duet.

Fogg played a British song. Wei did a Chinese one similar in melody. One song led to another bringing the audience of 1,000 to their feet. Then expedition team members and their Chinese hosts joined the troupe on stage where they joined hands, made a ring and danced.

Fogg gave his flute to Wei as a gift. Wei tried to offer a set of flutes in return but Fogg declined. "You're a professional performer and always need these flutes", said Fogg. "So I can't take them. I've left behind my short flute but I've got something more precious – friendship".

END ITEM: XINHUA CORRESPONDENT LU HANKUI.



GUIZHOU TEAM By Andy Eavis



GUANGXI TEAM By Jerry Wooldridge



PAM FOGG MEETS THE DANCERS By Gavin Newman

RECONNAISSANCES AND THE FUTURE

Four hundred years ago Xu Xiake, the father of Chinese speleology, walked through the Provinces of Hunan and Guangxi. Guided by tales from other travellers and gaining knowledge from local people he located, explored and surveyed over three hundred caves. During reconnaissances by the Project we were regularly following in his footsteps. The incentives remain the same. In these Provinces, among the towers are numerous spectacular caves systems inviting exploration. With future expeditions in mind, small teams searched for speleologically exciting sites.

Near the village of Gong Chuan in west Mashan mammoth entrances led quickly to sumps, large fossil chambers contained beautifully formed stalagmites and cave dwelling snakes were in evidence but potential was limited.

Long An county to the west of Nanning city has good

potential with big open passages awaiting exploration at four major sites.

At Jin Yi Shan in south west Hunan Province, Project members spent three days visiting a variety of caves including one, Chonghua Yan which contains wall writing carved during the Tong Dynasty (618-907 A.D.). Also in South Hunan large tourist caves at Chenzhou were seen to be part of a much larger and less known system.

With this information it has been possible to eliminate some areas from future plans and to direct the energies of large teams to areas of greatest potential.

The near future for the Project lies in Bama county where the potential seems unlimited for significant speleological discoveries.

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PROJECT ADVISORS AND REFEREES

George Band
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Lord Hunt
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Dr. Marjorie Sweeting
Professor Yuan Daoxian
Professor Ed Derbyshire
Professor Andrew Gaudie
Clive Jermy
Professor John Sutton
Dr. Tony Waltham
Nigel Winser
Professor Zhang Ying-Jun

THE CHINA CAVES PROJECT 1987 AND 1988 TEAMS

The British Teams: Andy Eavis (Project Co-ordinator and field member of both teams)

Guizhou. Dick Willis (Leader), Colin Boothroyd, David Checkley, Howard Jones, Tony White, Julian Walker, Dr. Hans Friederich, Roo Walters.

Guangxi. Tim Fogg (Leader), Ben Lyon, Jerry Wooldridge, Dave Gill, Dr. John Frankland, Charlotte Roberts, Pam Fogg, Paul Hatherley, Dr. Mark Noel, Simon Fowler, Mike Meredith, Rob Parker, Gavin Newman, Geoff Crossley, Steve Jones.

The Chinese Teams:

Guizhou. Xiong Kangning (Team Leader), Prof. Zhang Yin-Jun, Tan Ming, Li Po, An Yuauzhong, Dai Ming, Chin Xing Cheng

Guangxi. Zhu Xuewen (Project Co-ordinator), Wang Xunyi (Team Leader), Hu Mengyu (Deputy Leader), Tan Pengjia (Deputy Leader, Li Bin, Fan Luzhou, Fang Fengbao, Zhang Reng, Cao Jianhua, Lian Yanqing, Cui Yulong, Zhou Zhaodong, Zhang Congxian, Li Zongqing.

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A detailed account of systems, surveys and scientific work carried out in Guizhou and Guangxi will be published in Cave Science, the Transactions of the British Cave Research Association.

