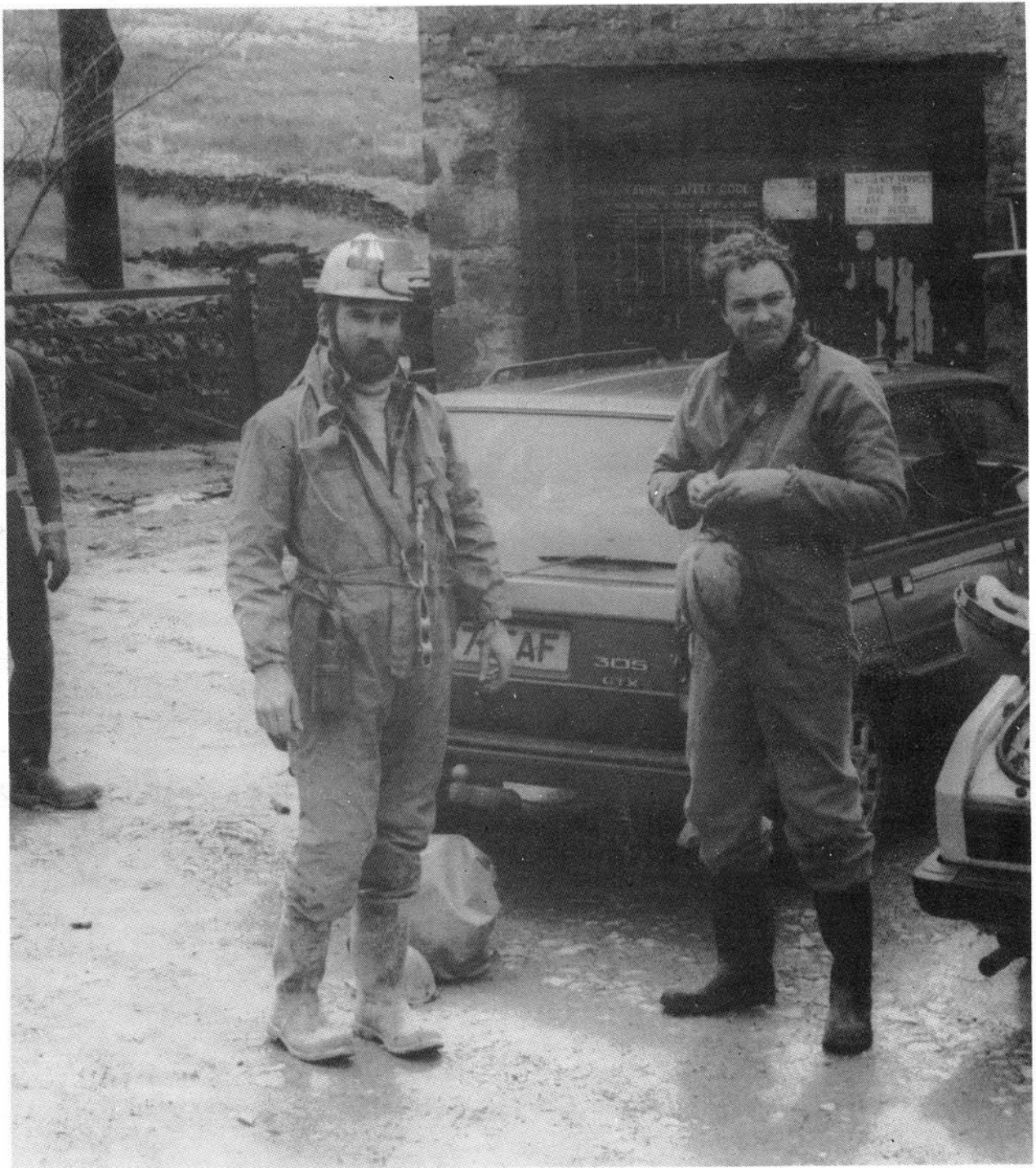


SOUTH WALES CAVING CLUB



EDITORIAL

Paham mae dicter, O Myfanwy . . . the voices, though not exactly in tune, were certainly full of enthusiasm. The room was hot and packed, pints of draft Bass bobbing over heads, fag smoke and laughter, SWCC were back home at the Gwynne Arms!

For many of us the Gwynne has always been synonymous with the club and in early days it was the meeting place for the embryo group that set out to explore Dan yr Ogof. Forty years on the club can be justifiably proud of its achievements, there is also a special anniversary this month for the 'new' discoveries in Dan yr Ogof.

This Newsletter records two visits by club members to China (about as far from Penwyllt as you can cave); a major article on electronics and its use in the Ogof Beacon (a scientific first for the club) as well as other tit-bits including an article on Dan-yr-Ogof, our 'first' cave.

Articles for the 40th Anniversary publication are still very welcome, as well as articles for future Newsletters.

*Cheers!
Gary*

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It is with great regret that we note the death of three women who are closely associated with the Club. Margaret Jenkins and Iris Major were club members well known to nearly everyone; older members will recall Gwen Round as the girl-next-door in the days of the Pen y bont HQ. We extend our condolences to all the families concerned.

TRAVELS IN CHINA

An Introduction to the World's Greatest Karst Area

Last summer I spent six weeks travelling around China, Hong Kong and parts of Thailand and managed to get underground on a few occasions. China has the largest area of exposed limestones and karst in the world, 1,200,000 sq. km. in all.

Contrary to popular belief it is easy to get into China as an individual traveller and in fact it is getting easier all the time as the country is slowly opening its doors to the West. I was surprised at how free it all is but we were told that the biggest changes have occurred this year. It is getting too Westernised too quickly and some of the towns are becoming very touristy, but the people all seem very happy and content, many have discarded their green or blue "Mao suits" for Western clothes and they seem to have more money.

We (Ray Mansfield, Janet Woodward and I) flew to Hong Kong intending to get our Chinese visa there as it is much easier than trying to obtain it in this country, and rather than taking a very expensive package tour we wanted to travel independently. In Hong Kong there are plenty of organisations arranging visas and we went to one of the most popular: Time Travel on the sixteenth floor of Block A, Chungking Mansions, Nathan Road, Kowloon. The mansions are a rabbit warren of cheap rooms, factories and shops which have to be seen to be believed, I dread to think what would happen if there was a fire. We applied for an Express Visa (£7) on Monday and we had the visa by Tuesday evening, so on Wednesday morning we were off to China... not by slow boat but by hydrofoil. This took us from Hong Kong, up the Li (xi) Jiang (Jiang = river) to Wuzhou and ultimately Guilin. Our intention was to work our way westwards across south China as this is the main limestone area. I saw my first Chinese tower karst from the bus from Wuzhou to Yangzhou and found it all very interesting and exciting, eagerly looking out for cave entrances, but after almost a thousand miles of karst and hundreds of entrances it all began to get a bit boring.



Map of Southern China showing Karst areas

CHINESE KARST

As previously mentioned, China has the largest exposed karst area in the world - one seventh of the country. The Chinese word for karst is Yienyung and its recognition dates back to the Chin dynasty of 214 BC. The areas of karst in different rocks are: Mesozoic 140,000 Km²; Upper Palaeozoic 815,000 Km²; Lower Palaeozoic 189,000 Km² and Proterzoic 101,000 Km². There are also limestones in the Cenozoic or Quaternary formations. The Upper Palaeozoic are of greatest importance.

South China forms the largest coherent karst area, more than 6000,000 Km² mainly around Guilin, Nanning and Kunming. The most important varieties of karst there are the tower karst plains of Guangxi, doline and valley karsts, stony karst and karren type. The tower karst of Guangxi is the best known. These impossibly shaped towers rise up out of paddy fields and water, with rivers meandering between them. There are thousands of them ranging from 50m to 300m high, nearly all with vertical sides and containing caves, and indeed are often cut through by them. It has to be seen to be believed. Around Guilin the towers are quite close together but around Yangshou they are separated by wide alluvial river terraces. Between the towers the plains are flat and often cultivated for rice.

1. Feng Tsung - Doline Stage.

Doline-like depressions which occupy about one third of the total height of the relief.



2. Feng Lin - Valley Stage.

Hill group with valleys. Steep towers and U-shaped valleys.



3. Tu Feng - Isolated Peak Stage.

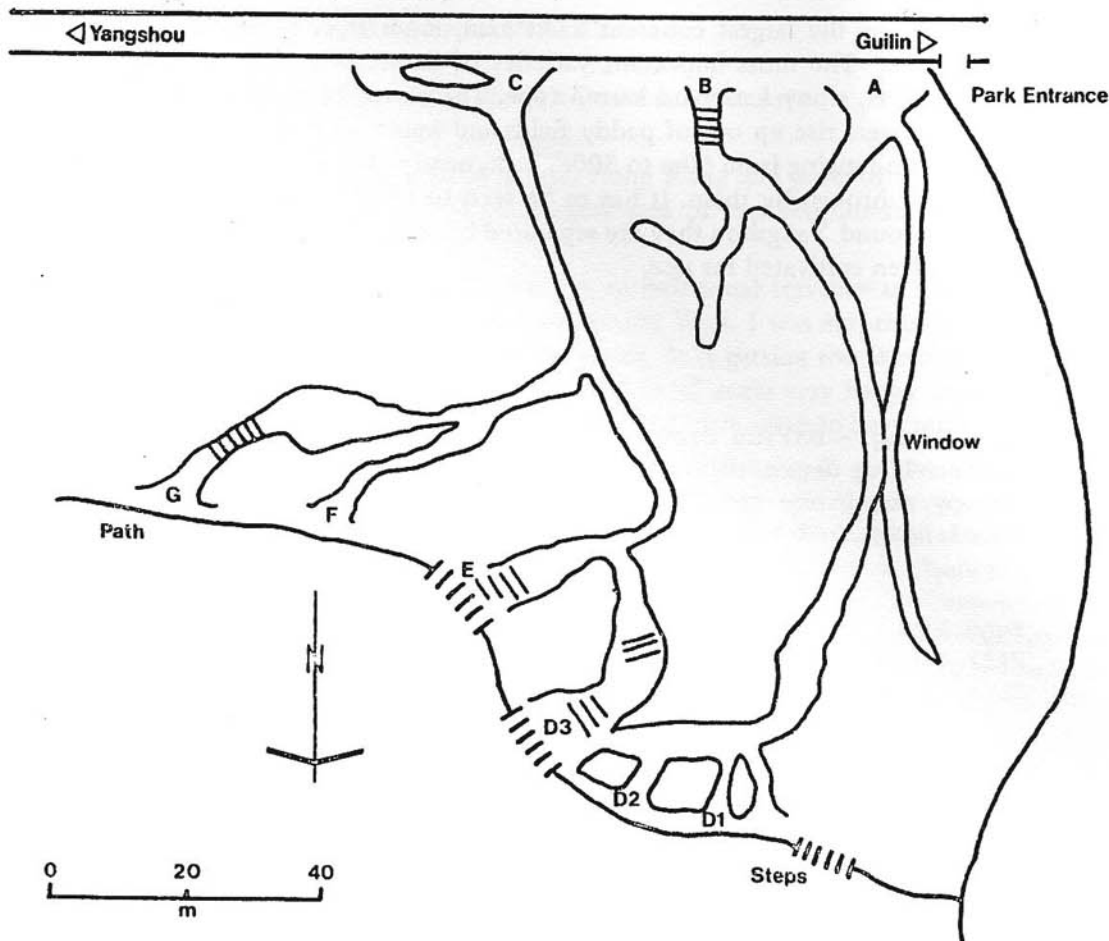
Peaks rise from an alluvial plain with river terraces.



Stages in the Evolution of Guilin karst

Our first stopping-off point was Yangshou (Bright New Moon) which was my favourite place of the trip - much nicer than the more famous and so-called "Beautiful Guilin". Yangshou is a little market town situated on the Li Jiang, 50 miles by river from Guilin. The river is 437 Km long and stretches from Wuzhou to the Miaoer Mountains north-east of Guilin. The scenery is probably better than that of Guilin and it is in the centre of a rich agricultural area where the main crop is rice, although sugar cane, bamboo and pomelo are also grown. Although the town is becoming touristy it is not too bad yet. We spent three nights here in the Xi Lang Hotel which cost under £2 per night for a room with shower.

Our first taste of Chinese caving was in the Yang Shou (People's Park). We had walked around in the morning looking at the many entrances, then Ray and I spent the afternoon exploring and surveying. First of all we went to see an entrance across the road in the opposite hill which we had first noticed from the pagoda on Youth Hill. We had to walk through a housing estate and concrete pole factory to reach it, and it turned out to be a mine with a small crushing plant outside. The underground workings was just one big chamber. So we went back to the park and went in one of the entrances to the cave in the tower next to Youth Hill, Liaxian (Visiting Immortals Cave) perhaps in Zhong Ling Shan (Fine Spirits Hill) and followed the maze of passages around, surveying as we went. We kept appearing out of one of the eight entrances (some of which were multiple) and at one stage emerged about fifty feet up a cliff face, disturbing a colony of bats in the process. The survey proved quite complex as we had to keep doubling back on ourselves. We eventually connected all the entrances which in fact were all joined up outside by paths. We wore just T-shirts and shorts which were more than adequate, and used FX2 lamps which can easily be charged as China uses the same mains voltage as this country. Walking back to the hotel we spied another entrance in the tower by the hotel, this time with an unlocked gate on the entrance . . . so we went in. The only way on from the entrance chamber was a passage on the right which had been blocked off, but we could squeeze over the top of the walling to enter the cave proper. The passage did a Z-loop then a pretty passage well decorated with dry old stal led almost in a straight line to another entrance. We had walked right through the tower and came out vertically above the hotel. We then had to scramble up the face to reach the path. Unfortunately I was unable to find the names of any of the caves at which we looked.



Sketch survey of cave in Yangshou Park

The next day we hired bicycles (30p per day) and set off with FX2's and helmets to explore the surrounding countryside. The Chinese were all quite amazed by the fact that I couldn't ride a bike and stared as I wobbled down the road and had trouble on the corners! We cycled towards Wuzhou (south-east), stopping to look at any roadside caves we came across but ignoring any which were too far from the road as we were spoilt for choice. The largest entrance we investigated was in the base of a smallish tower surrounded by paddy fields, but it turned out to be sumped. We then did a through trip in the next hill before cycling onto the next interesting site. We stopped for lunch (a pomelo) by a cave and dozens of children appeared as if from nowhere. Ray and I went to look at the cave and were followed, like the Pied Piper, by the children, but none of them were brave enough to enter the dark and waited for us at the entrance. The cave only went about a hundred feet or so before degenerating into a crawl, and as there was a lot of fresh straw on the floor we decided to retreat before we came face to face with an irate animal.

From Yangshou we took the boat up the Li River to Yangdi (Yangti) and then to Guilin, passing through some beautiful karst scenery, cliffs, towers, bamboo groves and villages. After four hours the boat broke down which gave us ample time to study the cliffs. We stopped twice more before the boat finally died completely, we then flagged down and piled onto an old wooden boat taking people and animals to market. I sat outside on deck in the rain when suddenly a puppy appeared from under the floorboards before being thrown back down - obviously someone's dinner. Yes, they do eat dog in China, in fact almost anything that moves is eaten.

We eventually arrived at Yangti after almost nine hours instead of five only to find there was no bus to Guilin! So we and four other Westerners flagged down an empty ferry and arrived at Guilin after thirteen hours (it would have taken only one-and-a-half by bus). However on the way, at Coapingxu, we went past Crown Cave (Guan Yan), a resurgence cave with a large entrance and spectacular stal hanging from the roof (hence the name). The cave has been explored from both ends as far as the sumps, and has over 3Km of dry passage. It is one of the major sites which will be pushed by the British team this November. The cave has been known for centuries and a spring inside supposedly produces high-quality water for making tea. On the wall of the cavern is carved a poem by the Ming dynasty poet Cai Wen:

A deep cave opens in front of river waters,
 Where odd stones and graceful flowers get together.
 From within the cave a stream of clear water flows;
 Where its sources lies only our God Almighty knows.

The cave is known to have four chambers and can be entered by bamboo raft in low water seasons (autumn and winter). From the first chamber a low opening goes through to the second with an even lower arch to the third which sumps off in high water. The fourth chamber is bigger and has sand banks. Hopefully the rest of the cave will be explored and the sumps dived in November.

The next morning we set off to look at "Beautiful Guilin" which is in Guizhou province. I was disappointed with the town itself which has become very touristy and has a thriving black market. Guilin is one of China's most famous beauty spots and is often featured on scroll paintings. The town is drab but the surrounding countryside is in the heart of the karst area. The spectacular tower karst is riddled with caves which overlook paddy fields in the alluvial plains. All the hills have folklore names, for example Youth Hill, Folded Brocade Hill, Father and Son Crag, Stone Figure Pushing Millstone Hill, Clean Vase Hill.

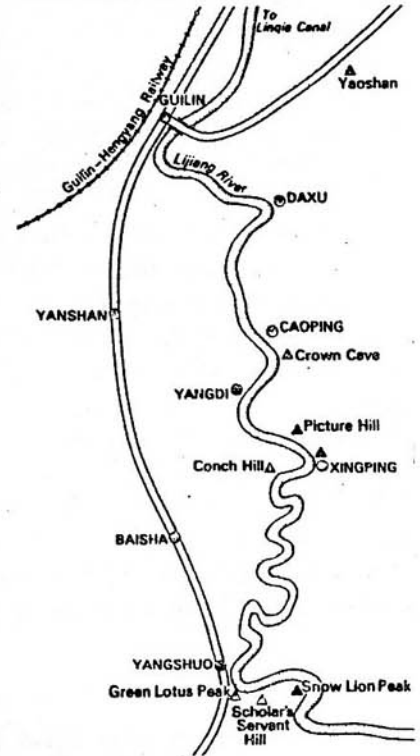
Our first Chinese show cave was Seven Star Cave (Qi Xang) situated half way up the north-west side of Potaraka Hill. The hill is in the northern corner of Seven Star Park. To reach it we walked past Wind-Originating Cave (Yuan Feng Dong) which has a continuous current of air issuing from the entrance. Steps lead up to Seven Star Cave, but firstly one walks through a short cave to reach the ticket office. The admission cost just under 10p! Steps lead down to the huge entrance chamber where there are four large carved characters on the wall : Di Yi Dong Tian - Number One Heavenly Cave. A 20m high passage leads off from here and the whole cave is full of huge impressive stal. As seems to be typical of Chinese show caves the cave itself is badly lit but with the formations outlined in brightly coloured lights. As soon as the party goes through one section the lights are switched off behind.

Apparently the guide's talk mentions all the figures and shapes that one can see or imagine in each formation - typical of Chinese folklore. At one point tourists can have their photos taken by floodlight underground, something which is very popular with the Chinese.

The cave is also known as Lingering Sunset Glow (Qixia) Cave, or Verdant Void (Bixu) Cave. It was first explored by Xu Xi'ake (1586-1641) who drew a remarkably accurate survey for four hundred years ago. The cave has three levels. Some 8 to 12m above the middle one the top level was formed in the Quaternary period. The first (lower) level is 12 to 15m below the middle one and has the river running through it all year round. The cave is 5Km long with 1.3Km of the middle level open to tourists. This contains the most formations and houses a 1Km long tunnel, 43m wide and 37m high. The cave has actually been known of since the Sui dynasty (581 - 618). We left the show cave by an entrance on the other side of the hill and walked down to Camel Hill (Luotuo).

We then continued our search for the Institute of Karst Geology. We had looked for it before lunch and had ended up at the University on the wrong side of town. After a long walk we eventually found the Institute and were introduced to Yuan Daoxian, the Director. Professor Yuan is a really friendly man who speaks excellent English (as well as Russian), he has been over to this country several times and knows some English cavers. We chatted for a while before he showed us around the museum. This is very nicely laid out with good samples and excellent photos. An amusing story we were told concerning a very fragile stal. It was brought to Guilin by train travelling soft sleeper class (first class) because it was so delicate. Normally the Chinese travel hard seat (third class) so the stal, and the man accompanying it, had a luxurious journey. We were also told that many stals had been removed from the caves and broken up for use on the fields to counteract the high phosphate levels, but fortunately this practice is being stopped. From the museum we had a look at the library before saying goodbye to Professor Yuan who supplied a chauffeured car to take us back to our hotel. There are only two karst institutes in the world, the other being in Yugoslavia. Professor Yuan set up the Guilin Institute (on the site of an old graveyard) in 1976 with a staff of twenty which has now risen to 260, all of whom live on site.

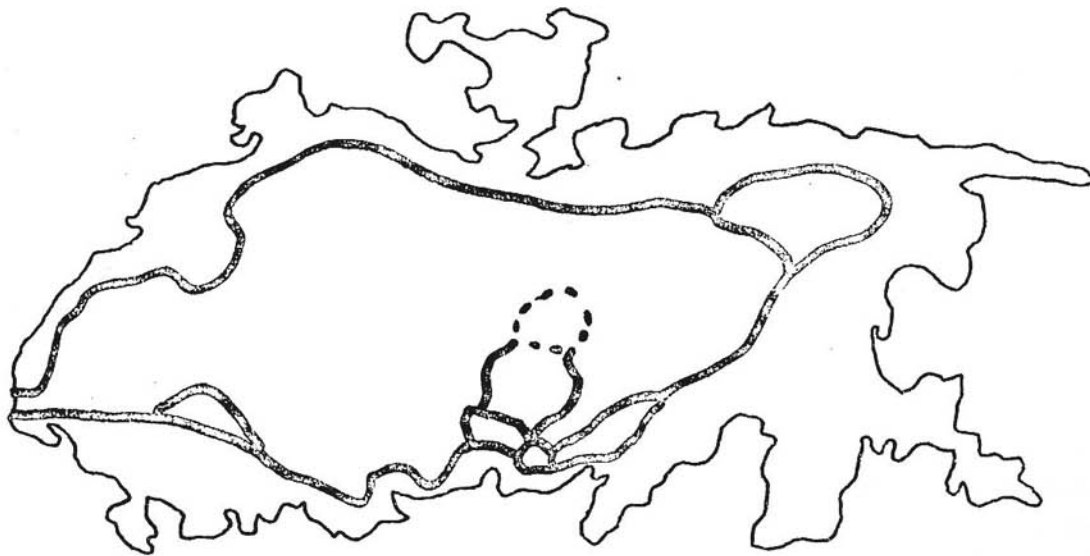
THE GUILIN-YANGSHUO RIVER TRIP



On the way to Reed Flute Cave the next day we stopped to see Elephant Trunk Hill (Xian Bi Shan), one of the most famous sights in Guilin and so called because it resembles an elephant dipping its trunk in the water for a drink. On the hill top is Elephant Eye (Xiangyan) Cave which goes right through the hill. At the foot is the famous Moon-In-Water Cave (Shui Yue) between the elephant's trunk and fore legs which looks just like a silver moon floating on the water. The hill stands at the fork of the Lijiang River and the Yanjiang (Sunshine) River and is 300 ft high and over half a mile in circumference. It was first used as the site of an Officer's camp in the Ming dynasty (1368-1644).

Legend has it that the hill was once a real elephant in the service of an emperor. The emperor had travelled several thousand miles from the north to Guilin when the elephant became sick and was unloaded and left to die. An old couple found it lying there and nursed it back to health. In gratitude the elephant stayed with the couple and helped plough their fields which the emperor's army had trampled down. The emperor later realised he was one elephant short and sent men to retrieve the once-sick animal. The elephant refused to return and tried to escape so an army was sent to recapture it. They fought for three days with the elephant killing many men. Finally the emperor approached the elephant and pretended to offer it a good future and told it to have a drink before moving. As it dipped its trunk in the Li Jiang the emperor drove his sword into its back, killing the creature. Although it was dead it didn't fall over and eventually turned into Elephant Trunk Hill. Today the sword can be seen in the form of the little Buddhist temple on the top.

Reed Flute Cave (Lu Di Yan) is the other major show cave in Guilin and is situated on the west side of town on the south side of Bright Hill, a No. 3 bus goes to it. Outside the entrance were many tourist stalls and buses. Ray managed to buy the entrance tickets for the local price of 30F (10p) as opposed to the tourist price of 1.20Y (40p). The cave is basically one huge chamber with a path around the edge, but it is packed with huge stal all brightly lit. Again the actual cave isn't lit, just certain stal with the lights switched off as one passes through. A very impressive cave and well worth the 10p! The cave gets its name from the many reeds that grow on the hillside near the entrance. Legend has it that the cave is really a section of a great palace that was long ago divided and hidden in the mountains of South China. The largest part of the show cave is called Crystal Palace and is 93m wide. The cave is 240m long and is reputed to be 6000,000 years old. The circular tourist path covers 500m. Over the centuries many poems and other inscriptions have been carved on the walls. Seventy-seven of these are preserved, dating from 792 - the eight year of the Zhenyuan reign of the Tang dynasty. Some are still discernable after more than a thousand years.



Survey of Reed Flute Cave showing tourist path

Our next visit was to Dragon Refuge (Longyin) Hill or Crescent (Yueya) Hill in Seven Star Park, so called either because of the hillside Dragon Refuge Cave (Long Yin Dong) or because it has on its slopes a crescent-like cave. The cave (also known as Hidden Dragon Cave) is in the base of the hill on a small branch of the Lijiang called Small Eastern River, or the Xiao Dong Jiang River. It was first known as Hui Xue = Tortuous Cave. It is open at both ends in the west and in the south. A winding trough on the wall runs the entire length of the cave and on which there are what look like dragon scales, really scallops caused by water erosion. Legend has it that the dragon retired here with its head in the south and its tail in the west. Later it broke through the walls and flew away. This accounts for the four large characters carved on the wall; Po Bi E Fei (breaking through the wall and flying away).

The cave is rich in stone carvings. On its southern walls are songs in praise of azalea by some Tang poets which are the oldest carvings in Long Yin Dong. Hanging from the top of the left wall, which bears the names of thirteen Song dynasty writers, is a stalactite 1.6m long and reputed to be 800 years old. Outside the cave on the left wall are engraved the names of three Generals. Long Yin Dong is noted for its clear water, curious shaped cave, incessant breeze and magnificent reflections in the stream.

The Forest of Steles (Gui Hai Bei Lan) or Dragon Refuge Crag (Long Yin Yan) is not far from Long Yin Dong and is a rock shelter containing many steles. Essays and poems were carved on these stone tablets and the rock face by ancient scholars. They praise the natural beauty of Guilin and are regarded as historical and cultural relics, reflecting the political, economic and other conditions in Guilin of old, dating back as far as the Song dynasty (960 - 1279).

There used to be a temple in front of the entrance to the crag which was rebuilt in 1964 into a structure where the stone tablets are kept. There is at the entrance a small cave which contains a conch-like stalactite, which is why the cave is also known as Conch Cave. Yet another name is Cloth (or Cotton) Bag (Budai) Crag, as the whole place is shaped like a bag. According to legend an old dragon was hidden here and on the rock face above the entrance are engraved the Chinese character Long Yin Yan - meaning Dragon Refuge Crag and Long Teng, meaning Leaping Dragon. We then followed the path around the hill and had a quick look at some of the other caves in the area - Red Osmanthus (Dangui) Cave, White Crane (Baihe) Cave, Avalokitesvara (Guanyin) Cave and Deep and Windy (Yuanfeng) Cave.

We then made the slow thirty three hour train journey from Guilin to Kunming through 1100Km of karst scenery. This famous railway line crosses the Guizhou plateau and the marginal zone on each side of Guiyang. From the window I saw more cave entrances than I thought possible. From Kunming we went on a day trip to Shilin stone forest (Shilin is Chinese for stone forest) seventy five miles to the south east. The forest is actually a karren and covers an area of more than 26,000 hectares consisting of stone pinnacles and columns up to 100 ft high. Some of the columns are solitary, others are in clusters with chasms winding around them. The path leads through caves and around pools and there are a couple of viewing platforms. Needless to say, many of the stones have names - Mother and Child Viewing the Scenery, Woman Longing for Her Husband, Elephant on a Platform, and so on. The forest was neglected in old society but now all the paths have been done up. Unfortunately the whole area was packed with tourists, mainly Chinese and Hong Kong.

After leaving South China for the North we did no more caving, however I'll briefly mention Peking Man.

PEKING MAN CAVE

The cave home of Peking Man at Dragon Bone Hill near Choukoutien is 50Km south west of the city of Peking. It lies at the south eastern foot of the Western Hills. Opposite Choukoutien on the west bank of the Paerh River are two hills, one is called Dragon Bone Hill and has a cave on its northern slope. In this fossil remains of Peking Man together with artifacts, traces of the use of fire and a variety of animal bones have been found. These finds show how Peking Man, intelligent and hardworking, struggled indefatigably against nature to create a primeval culture in China.

In 1929 Chinese workers and scientists dug up the first complete skull cap of Peking Man, dating to about 18,340 BC. Fossil remains of the Upper Cave Man dating back more than 15,000 years were found in a cave further up the mountain. The remains of eight people of different ages have been found here. Today an exhibition hall stands nearby where the finds are displayed.

GENERAL INFORMATION AND TRAVEL NOTES

The most important thing to remember is that as soon as you arrive in any Chinese town or city you must make preparations to leave it. This is because buying plane, train or bus tickets can be very difficult especially if the Chinese are feeling awkward at the time. Secondly, be patient. When buying tickets the best thing to do is to write down a phrase in Chinese, e.g. "I want to buy two tickets to . . ." and then just insert the place name. If you have the fare offer the correct money (i.e. Chinese price) and hope this will be accepted. There seem to be about three price scales for most things - Chinese, overseas Chinese and foreigners.

There are two sorts of money. Foreign Exchange Certificates (FEC) which you are given on entering the country and the Peoples' Money called Renminbi. Generally speaking you use FEC for hotels, fares, etc and renminbi for ordinary shopping. However the black market is thriving in some parts of China and it is possible to exchange 100 FEC for 160 renminbi. This is because the Friendship Stores sell luxury and Western goods as well as items such as motor bikes and will only take FEC, so the Chinese are desperate to get this money. Everything is really cheap in China, especially travel, accommodation and food.

Talking of food . . . the Chinese tend to eat anything that moves, so be prepared for some strange sights. Apparently things are not as bad as they were two or three years ago when restaurants looked more like pet

shops with cages of live animals in them - dogs, cats, squirrels, monkeys and bears. At least the food was fresh! The only caged food we saw was bird, tortoise, snake, eel and frog. We did see dog on one market stall, complete with head, tail and innards on the plate, although fortunately saw no dogs being slaughtered on the street. The basic food is obviously rice, sometimes replaced by noodles. In addition to the bowl of rice (average 3p) one can choose from many vegetables and usually pork, beef(?) and chicken. I avoided the latter as the Chinese go mad with the axe and chop up the whole carcass, so one constantly has a mouthful of bone and skin which is spat out onto the table or floor. Fingers are not used. Chinese table manners are disgusting but the thing I hated most about the whole trip was the spitting. All the Chinese do it everywhere, at table, in buildings, on buses, out of bus windows. It is a revolting habit and obviously spreads germs - all Chinese seem to have a bronchial-type of cold which we (and all the other travellers) also suffered from.

The other main point about China is the staring. It is not as bad now as they see more tourists but it still happens in places. The locals will come right up and stare, mouths often ajar and they're not at all embarrassed by doing this. They couldn't get over how large we are to them and how we all have big noses. They seemed fascinated by Ray's beard as Chinese men can't grow them until middle age. I generally found the Chinese unfriendly and the spitting and staring prejudiced me. However those that spoke English were just the opposite, they would come up and talk, drawing a big crowd of spectators around. Once or twice we were moved on because our audience became too large! Also any time I tried to write anything in my diary I would be watched and sometimes the book would be taken out of my hand as they were fascinated by what I was doing.

One learns to be patient in China, especially when buying tickets, trying to get hotel accommodation or waiting for food. The most commonly used word in China is "no". There are no beds, no tickets, no boats, etc, etc. Quiet persistence is the answer. Also the Chinese don't queue except for food rations such as bread in the mornings. Consequently getting on a bus, buying a ticket or even going to the toilet on a crowded train is a fight. It's an "elbows out and push" situation. Travelling is slow, especially the trains, and a lot of transport we went on broke down - one boat three times, a bus twice, a trolley bus and a plane (fortunately before we took off!). It is also frustrating as everything is so crowded. You can spend hours queueing at a window for a ticket only to find it is the wrong one, and then you have to pay nearly twice as much as the locals:

Toilets leave a lot to be desired, just holes in the floor, but at least nothing is wasted because in the morning the ladies come along, ladle all the paper out into a bucket, then all the solids go into another bucket. This is then carried out to the fields and used as fertiliser on the crops. No wonder the vegetables are so plentiful! However we suffered no stomach problems, possibly because cooking by wok effectively kills off any germs. We were not particularly careful where we ate and often frequented the street food stalls.

Take tea, coffee and dried milk as throughout China hot water is supplied everywhere - trains, hotels, etc. Tin mugs with lids are used by everyone, the lids being essential on dirty, smokey trains. In spite of everything I enjoyed the trip and found China a fascinating country.

Liz Price



Limestone hills,
Kweilin, China.

Photo: Sally and
Richard Greenhill,
1976.

CHINA – THE LAST FRONTIER

It was like a bolt from the blue, unbelievable, an invitation to join a 10-man team to the greatest limestone area in the world; a vast, vast area that cavers had been clamouring for access to for many years. Moreover it was an area completely untouched, an area that could well yield the world's deepest cave and certainly some of the longest - China.

We had only returned from Borneo a few months previously, from an expedition that must rate as one of the most successful ever mounted. At the time it had seemed that nothing would ever compare with the jungle experience of Sarawak, but this had to be the ultimate. Cavers worldwide had wistfully talked of getting into China, longingly craved the opportunity, and now we Brits were the first to receive an invitation. Once again it was a coup masterminded by the well travelled expeditionaries Andy Eavis (leader of the Borneo expedition) and Dr. Tony Waltham. Both had worked tirelessly towards this day having made several visits to China to establish good relations and prepare the groundwork.

At the annual National Caving Conference British cavers had seen photographs and had heard the amazing Chinese situation related. The southern part of the country, in particular the province of Guangxi is wildly scenic; a dramatic landscape of limestone towers and ragged mountains riddled with caves. It all seemed unreal, a fantasy world; so different, so beautiful.

In the university city of Guilin the Chinese had established a national Karst Research Institute and their scientists now wished to make contact with fellow workers in the west. But from the caving point of view the most incredible thing of all was that caving as a sport simply did not exist. They had possibly the greatest potential for exploration in the world yet the sport hadn't been developed. It was a situation unparalleled anywhere else in the world.

Then in the summer of 1984, Prof. Yuan, the head of the Karst Institute came to Britain to attend a conference, meet British cavers and see some of Great Britain's caves and karst. Very shortly a formal invitation was received for Andy Eavis to take a team of 10 to Guilin.

Guilin lies approximately 500Kms. inland from Hong Kong and a similar distance from the Vietnamese border. It is a sub-tropical area on roughly the same latitude as the southern tip of Florida. Climatically the timing of the trip was crucial as the province experienced a brief dry spell in November. At other times many of the caves would be largely inaccessible due to flooding.

From the outset the expedition was planned as a joint venture with the Chinese, an expedient move that was unquestionably to benefit both parties. The scientists from the Institute were severely limited in terms of caving technique and apart from sharing in the exploration of the caves they gained immense experience in the process.

It took three days travel to reach Guilin and other than the spectacular nature of the landscape first impressions certainly revolved around the sheer numbers of people. This vast country possesses one quarter of the world's total, 80% of which live and work in the countryside, pursuing an agrarian, almost medieval way of life. The roads were always a hive of frenetic activity, festooned with bicycles carrying everything from pigs to telegraph poles. Memories of the constant ringing of hundreds of bicycle bells and the constant flow of people will never fade.

In the mountains we were always accompanied by crowds of curious locals, the majority of whom had never seen a westerner before. It was a unique experience, giving an insight to the Chinese way of life that would be impossible on an expensive western tour. In terms of employment everything was strikingly labour intensive. Padi fields, often the size of a small British garden, would be dug over by a single plough share, drawn by a cow or oxen; crops were planted by hand, fertilised, weeded, gathered, threshed, carried and stored all by hand. One could only marvel at the incredible amount of human effort that has gone into the landscape generally, the intricate nature of the irrigation schemes and the way that every square metre of land is utilised in some positive way. Nothing is wasted. It could best be described as labour intensive market gardening on a continental scale.

We quickly discovered that this positive attitude also extended underground. Enterprising local farmers, for example, using little or no equipment and simple candles for lighting, had partially explored many of the caves. Their interest was obviously neither scientific nor sporting. They simply utilised whatever resource the cave might present. In some caves they excavated nitrate over two kms. from the entrance (for use in explosives) while in other places without any financial backing they had attempted tremendously ambitious schemes to extract water, with some limited success.

In a number of caves we found elaborate irrigation projects designed to form a reservoir behind a dam - simplistic schemes to supply gravity flow to the neighbouring village or fields. Unfortunately lack of knowledge of the nature of limestone rock has meant that many such projects had been doomed to failure from

their very conception. We discovered several instances where huge obsolete walls blocked river passages - futile schemes where the water now percolated quietly beneath the very foundations.

The main river caves were quite unique. They were massive clean washed drains which in the wet season would be wholly impassable - taking vast rivers and transporting boulders as easily as a grain of sand might be moved along a British cave.

Possibly the most spectacular area visited was that around Nanxu, about 35 kms. south east of Guilin. A major stream disappeared here beneath a beautiful natural arch - to reappear approximately six kms. away at the far side of an impressive range of towers and cones.

Deploying our manpower to best advantage the team was split into two groups, one to tackle the cave where the river disappeared, Nanxu River Cave; the other to explore the area where it reappeared. Both groups enjoyed considerable success.

Nanxu River Cave itself was a huge tunnel, often well over 50 metres high, whose lower walls were smoothly polished by the constant bombardment of moving rocks in the wet seasons. In the early sections of the cave shafts of sunlight occasionally blazed down into the sombre depths from openings high overhead, presenting fabulous scenes and tremendous scope to the photographers. Life jackets were essential to reach the end of this cave and the final lake, over three kms. from the entrance, presented an eerie swim over 80 metres in length, through a vast chamber whose walls and ceilings could only dimly be discerned - a long swim over seemingly unfathomable depths.

Explorations were rapidly made. On day one of our stay at Nanxu all the above water sections of the cave were surveyed and a brief photographic record was obtained. In the process the lake was found to be the key to the ongoing explorations and the difficulties of mounting a dive at this point were assessed. It was evidently a long carry from our base camp and an intimidating prospect.

A series of dives took place here and following a deep 250 metre penetration the Lake Sump was passed only to encounter a further deep dive just beyond.

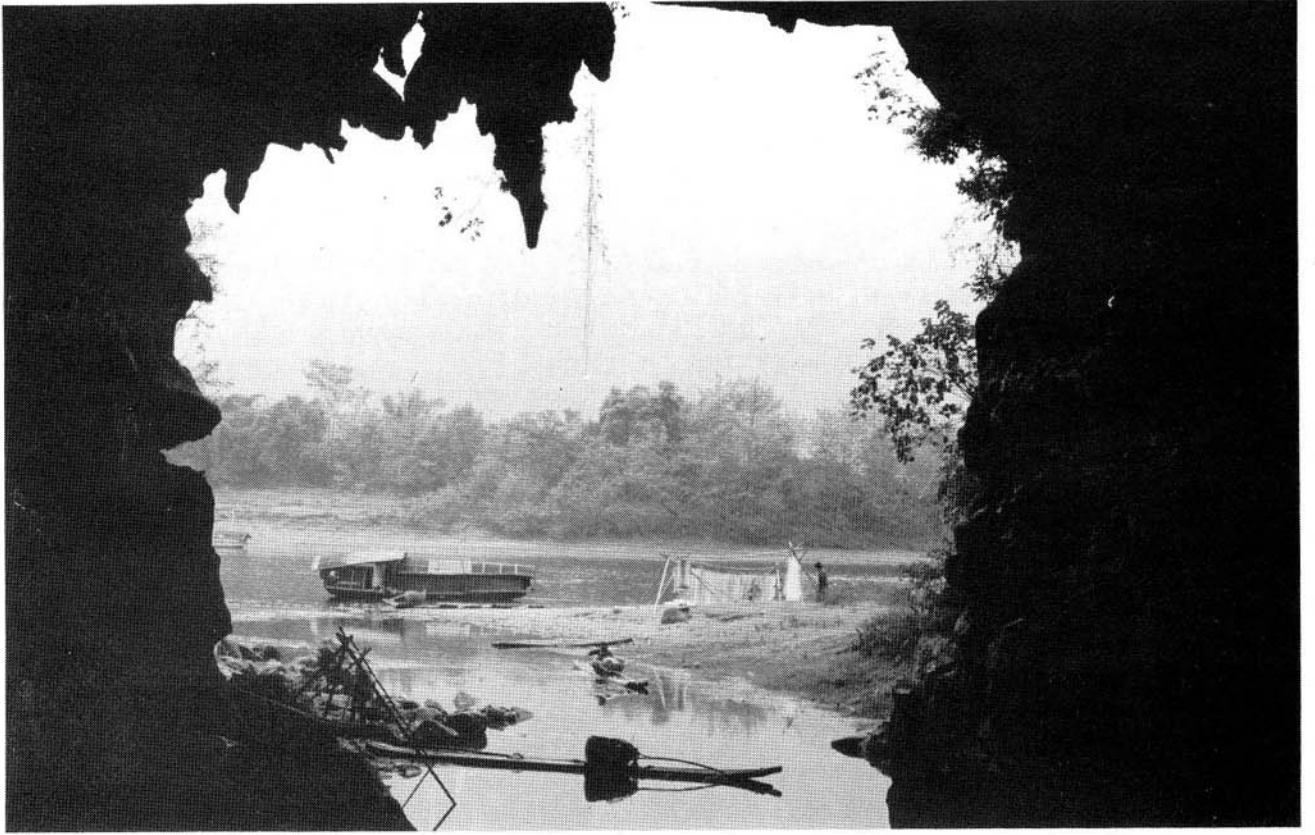
Equally successful explorations were achieved at the resurgence area, Guanyan. Over six kms. of cave were mapped here, including over 2.5 kms. in a direct line towards Nanxu River Cave. Explorations terminated at the inevitable sump, culminating in a 50 metre deep dive. A through trip may be possible one day, but not with the limited equipment at our disposal.

The rest of the trip was equally hectic for all concerned. In Guizhou for example Colin Boothroyd made the first descent of a 276 metre (900 feet) free fall shaft, the deepest in China. This took him several hours, as, for his troubles Colin had to join together every piece of rope the team had at the time - was it 10 lengths? Another major element in the programme was the training of the Chinese cavers. This took the form of lectures, practical demonstrations and of course real explorations, while at the end of the expedition a large part of the equipment was left with the Chinese so that explorations may continue.

Overall China Caves '85 was an extremely successful, highly prestigious expedition, another British 'first'. Over 30 kms. of cave was explored and surveyed. Excellent relations were established with our hosts and the final honour was the invitation to partake in another joint venture in 1987. Considering the incredible scope for exploration in this vast country it is quite clear that one day some of the world's longest and deepest caves will be established here, and in all probability by British teams.

Martyn Farr

TEAM MEMBERS: Andy Eavis - Leader; Dr. A. C. Waltham - Deputy Leader; Dick Willis - Secretary; Colin Boothroyd; Dave Brook; Tim Fogg; Julian Griffiths; Pete Smart; Tony White (SWCC); Martyn Farr (SWCC).



Exit of Guanyan cave on bank of Li River, Guangxi.

Photographs by Dr. A. C. Waltham, Trent Polytechnic



Carbonate Microfacies and Speleogenesis

In the article "Smith's fractured limbs," (NL No.88), mention was made to certain zones (lithofacies) in the limestones were more speleogenetically favourable than others. For instance: Why is it in South Wales that the Cil-yr-ychen limestone, (S2), is "riddled" with caves and other limestones seem to be lacking in them? Part of the reason might be something to do with the type of limestone.

Obviously, the formation of caves requires that some characteristics in the limestones are favourable to cave formation. The obvious ones are faults, joints, and folds, and obvious lithological changes, e.g. shales being removed entirely from bedding planes. These are relatively easy to recognise underground but changes in the microfacies of the limestone itself are only detectable with careful field studies and/or microscopic studies. The search for petroleum has allowed a great deal of work to be done on the depositional environments of reservoir rocks and the criteria for petroleum accumulation are kin to criteria for the solution of limestone and the formation of caves.

From studies of limestones in the search for oil and gas it seems that several limestone facies are particularly suitable for substantial porosity to originate or develop within. This can be a primary porosity or a secondary type. Most of the Cil-yr-ychen (S2, Holkerian stage) limestone appears to be a shallow water platform or shelf facies (George 1970). Many aspects of the Cil-yr-ychen fit a model of limestone facies as described by Dr Gerald Friedman, AAPG (American Association of Petroleum Geologists), (fig. 1)

The model is based on the idea that some limestones were formed in a shallow, continental (i.e. near the continental shelf) setting. In the Carboniferous this area was at least thousands of miles in it's extent. This setting can be visualised as being the submerged "continent", or that part of the Earth's crust where the underlying crust is a continental plate as opposed to an oceanic one. The term epeiric sea has been commonly used. Present day analogues of this are missing, so the present being the key to the past does not apply here. The model takes the initial form of fig. 1, where three facies are represented X, Y, and Z. In this illustration note the scale of each facies. The general idea of the model is that there are characteristics for each zone which can be seen in rock record sometimes wholly or partially preserved. The present day thinking with regards to the origins of dolomite will not be included but I suggest that Noel Christopher's and Rob Charity's view that the origin of dolomites in the Cil-yr-ychen is "hydrothermal injection" might need broader thought. Before getting into this a clarification of the facies described in fig. 1 must be made. Briefly the characteristics of each facies are:-

(after Irwin 1965, and Friedman 1985)

X facies (Source Rock)

Low energy, formed below wave base
Fine-grained particles, silt or mud-sized (lime-mud or silt)
Dark grey or black colour, ie. reducing environment.
High organic content, yields hydrocarbons, hence source rock
Strong petroliferous odour when "struck"
Sulfate reduction yields H₂S
Well bedded, suspension deposit
Usually seen as black or very dark micrite

Y facies (Reservoir)

High energy (i.e. at or near wave base, see fig. 1)
a. Reef facies, rigid framework of organisms
b. Skeletal facies (e.g. crinoid/brachiopod/bryozoan "sand")
c. Ooid facies (oolites or pisolites)
d. Rarely pellet facies
Light grey or light brown in colour; oxidising environment
Particles well sorted
Interparticle pore space or sparry cement
Lack of lime-mud matrix
Non-reef accumulation: horizontally bedded or cross bedded
(oolites can be festoon bedded and form mounds, or have lateral continuity.)
Reef facies: non bedded (somewhat rare in the Carboniferous)

Z facies (Seal, or Caprock)

Low energy (intertidal or supratidal)
Lime-mud or silt
Pellets
Light grey or light brown colour, oxidising environment
No bedding: bioturbation; mottled or speckled texture
Supratidal: algal mats (stromatolites)
dolomitisation and evaporites (gypsum, anhydrite, halite)

Obviously any field section will not look identical to any model, but if we include in our thinking erosion, depositional breaks, and the effects of transgression and regression then we can see a correlation between parts of the model and the section.

As you can see from the list of characteristics the facies are classified according to the situation of the hydrocarbon within, i.e. Source, reservoir, and cap rock (seal). It's not difficult to appreciate the importance of this facies model when in (geological) time the X and Y zones become tilted towards the basin because of deposition above, causing migration of the water, oil or gas updip into

the region of greatest porosity (Y facies) and it's escape prevented by the X facies. The sequence of fig. 2a is rarely found complete but parts of it can be found and the sequence is usually not difficult to recognise and is usually cyclic (fig. 2b).

Ross and Ross (1985), claim worldwide, synchronous, transgressive and regressive phases for the Carboniferous-Permian. As we can observe and is suggested by George (1970) there appears to have been a transgression during the Holkerian stage. (In other words the sea level gradually rose).

The identification of each of these facies can be done in the field using the guidelines of Friedman (1985), but more detailed work involves making acetate peels and describing those using a petrographic microscope. Having measured a stratigraphic column and described it, then each lithofacies should be recognised as containing any cave. This type of study with a detailed structural study should give a good idea why passages have formed where they have, and aid in finding "missing miles."

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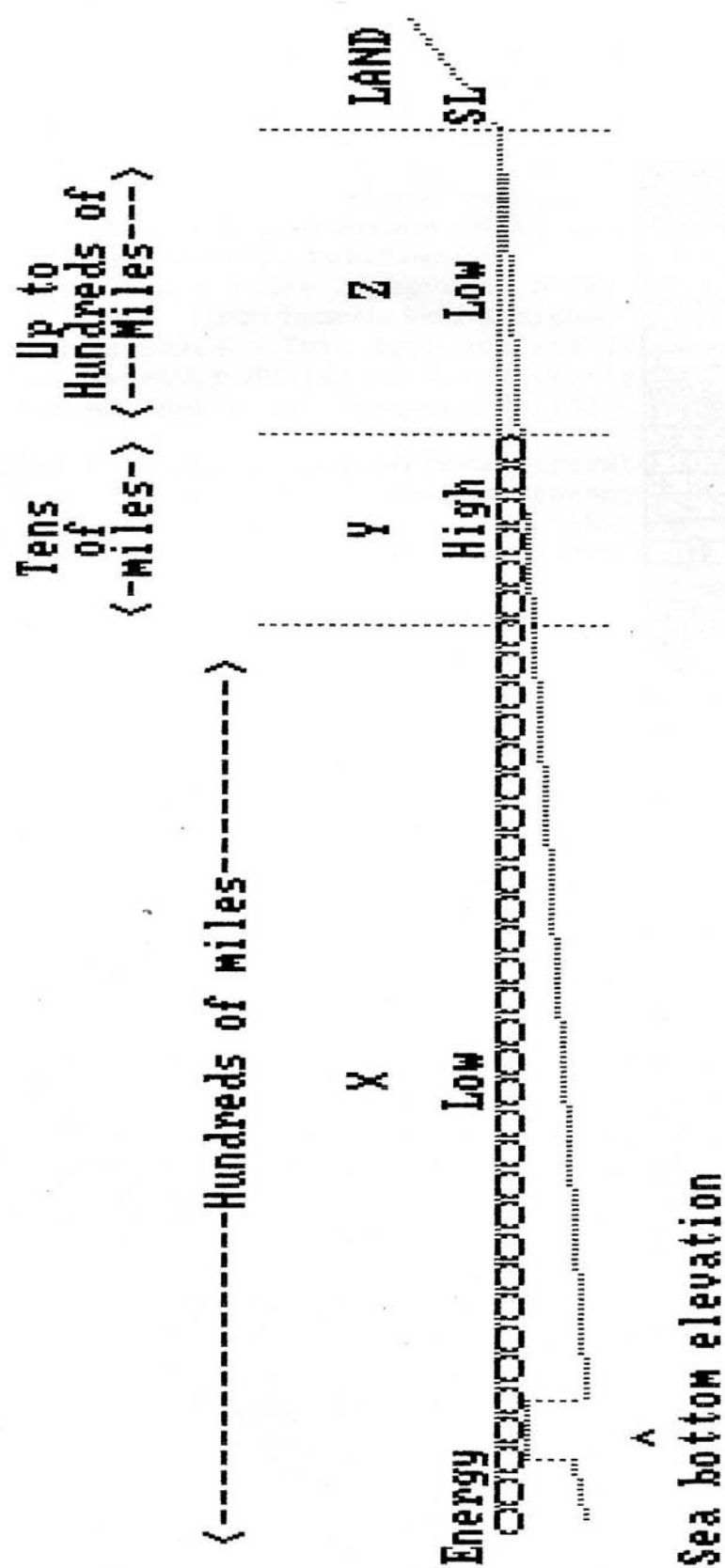
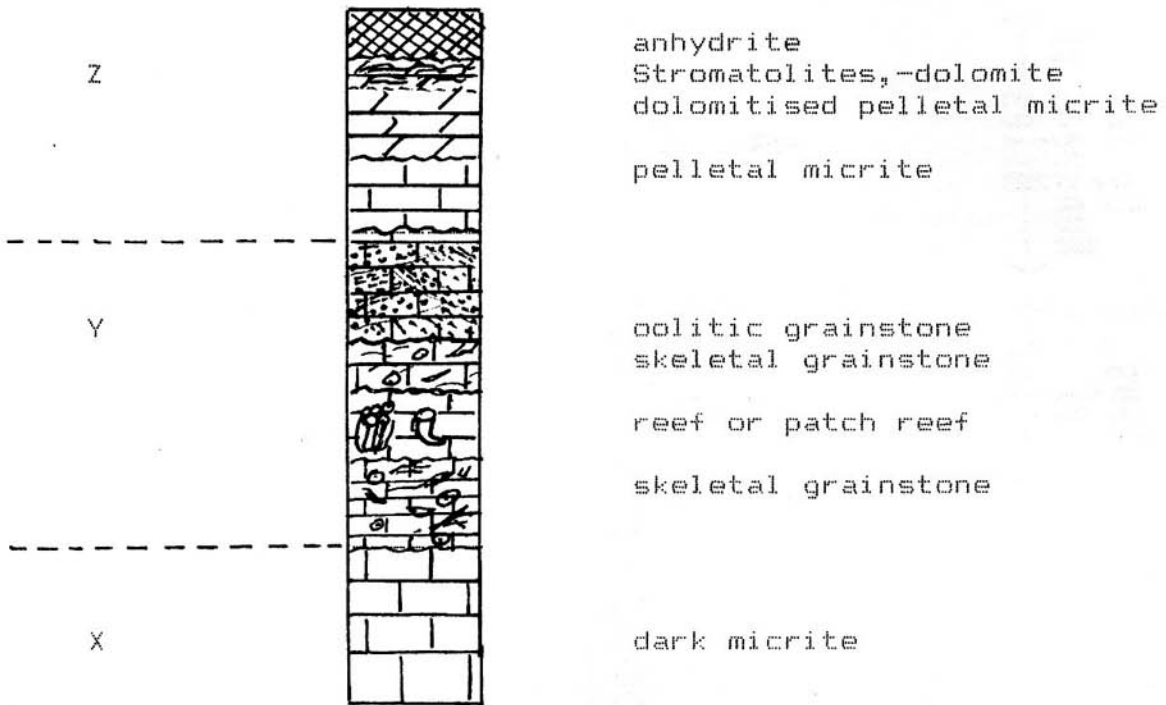
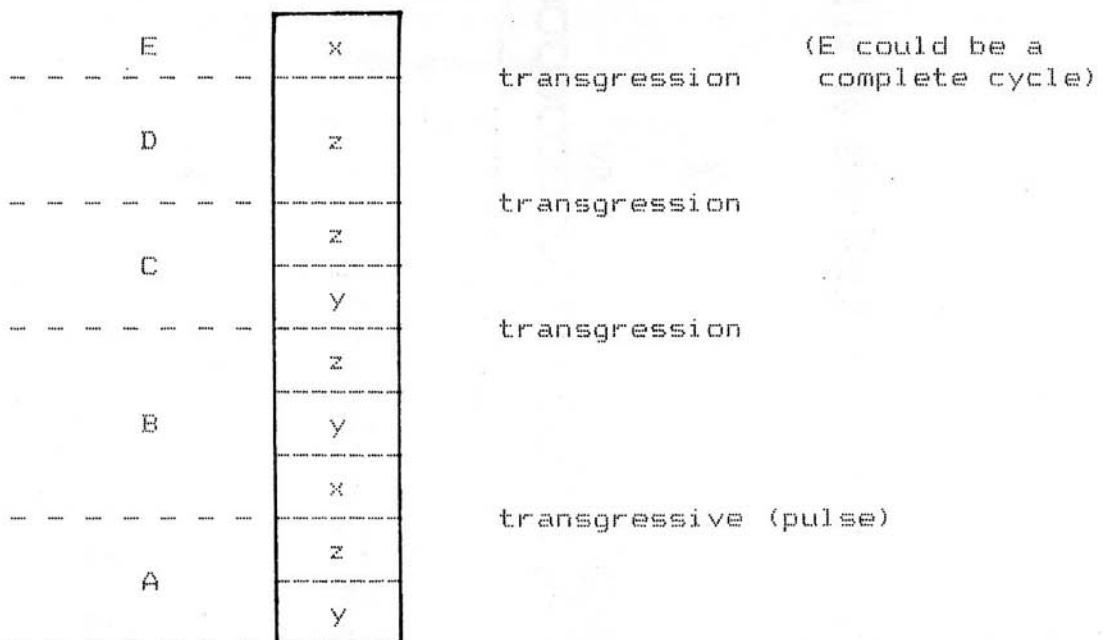


Fig. 1

Lithology



b. Typical (large scale) sequence.



Fast transgression followed by slow regressive cycles.

THE OGOF BEACON

by Anne & Andy Bell

The Ogof Beacon is a radio location device designed as an aid to cave surveying. It is not intended for two way communication. In normal operation the Beacon transmitter repeatedly sends a morse code character. There is also a facility to plug in a manual morse code key to override the automatic signal, but this is the nearest that the Beacon will come to actual communication.

Although we are aware of several other radio location devices [1,2,3,4] the Ogof Beacon was designed, in the main, without reference to these. This approach was taken because we wanted to base the receiver design on a receiver previously designed and built for amateur radio frequencies [5].

The Ogof Beacon consists of five separate items of equipment: a comparatively cheap and simple transmitter which is carried underground; an expensive and sophisticated receiver which remains on the surface; a loop antenna for each; and finally there is a Beacon Monitor which enables the underground party to check that the Beacon is operational. Figure 1 is a photograph showing all the Ogof Beacon equipment together with an additional large receiving loop.

In normal use the transmitter is taken underground and deposited at a prearranged site, at a prearranged time, and left transmitting. The surface party then locates the position of the transmitter on the surface and determines its depth. Typically 30-40 minutes are required to determine accurately the position and depth of the transmitter - all measurements being repeated several times.

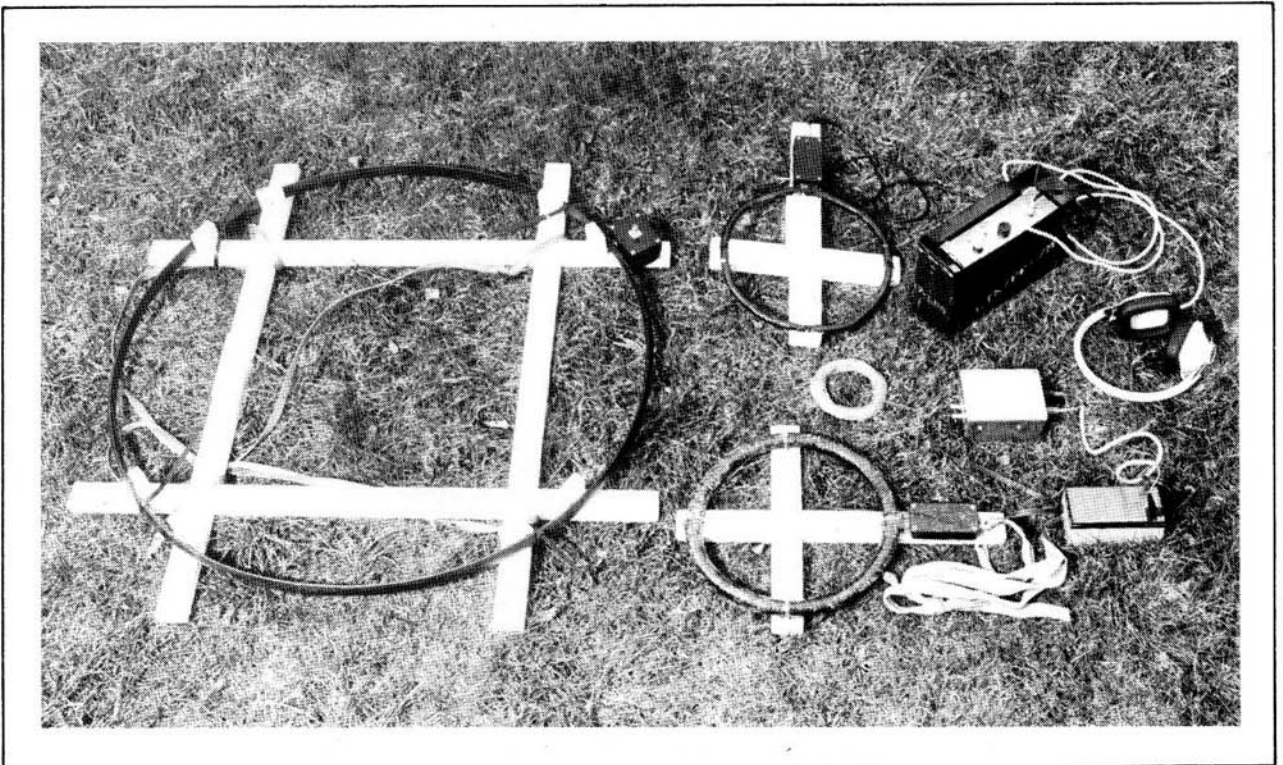


Figure 1 : Photograph by Chris Howes, Roath, Cardiff.

The Ogof Beacon Transmitter

A continuous tone type of transmitter was considered but discarded in favour of one which repeatedly sends a morse code character. The latter consumes less battery power although it has more complex circuitry. The transmitter frequency is crystal controlled to minimise the problems of frequency drift due to temperature variation and to some extent rough handling.

The Beacon transmitter, shown in Figure 2, is built around CMOS integrated circuits which during construction must be handled with extreme care to avoid destroying them with static electricity. A 2.4576 MHz crystal sets the input frequency for the 4060 14 stage counter. A 38.4 KHz signal is abstracted from pin 4 of the 4060. It is this signal which is modulated and amplified in later stages and used as the actual transmission signal. A 600 Hz signal is also abstracted from the 4060 and passed on to the 4040, which contains another 12 stages of counting. From the 4040, signals are abstracted from pins 4, 12, 13 and 14. These are used as inputs to the 4512 which in turn sequentially scans the DIL switches.

The 8 DIL switches, together with pullup resistors, describe the morse code character to be transmitted. A diode is included in the transmitter to avoid damage occurring if the battery is connected the wrong way round. A series fuse is also included. The transmitter was built on 0.1 inch matrix veroboard using wire-wrap techniques, but conventional soldering should be just as good. No layout problems were experienced. The circuitry is housed in a diecast box measuring 120mm x 92mm x 60mm, on which three connectors are mounted: battery input, RF out to loop antenna and lastly one used to connect a morse key and headphone. In an attempt to keep moisture out of the diecast box once the lid was finally in place the box was given a coat of varnish.

The length of wire between the RF outlet and the transmission loop should not exceed 18 inches.

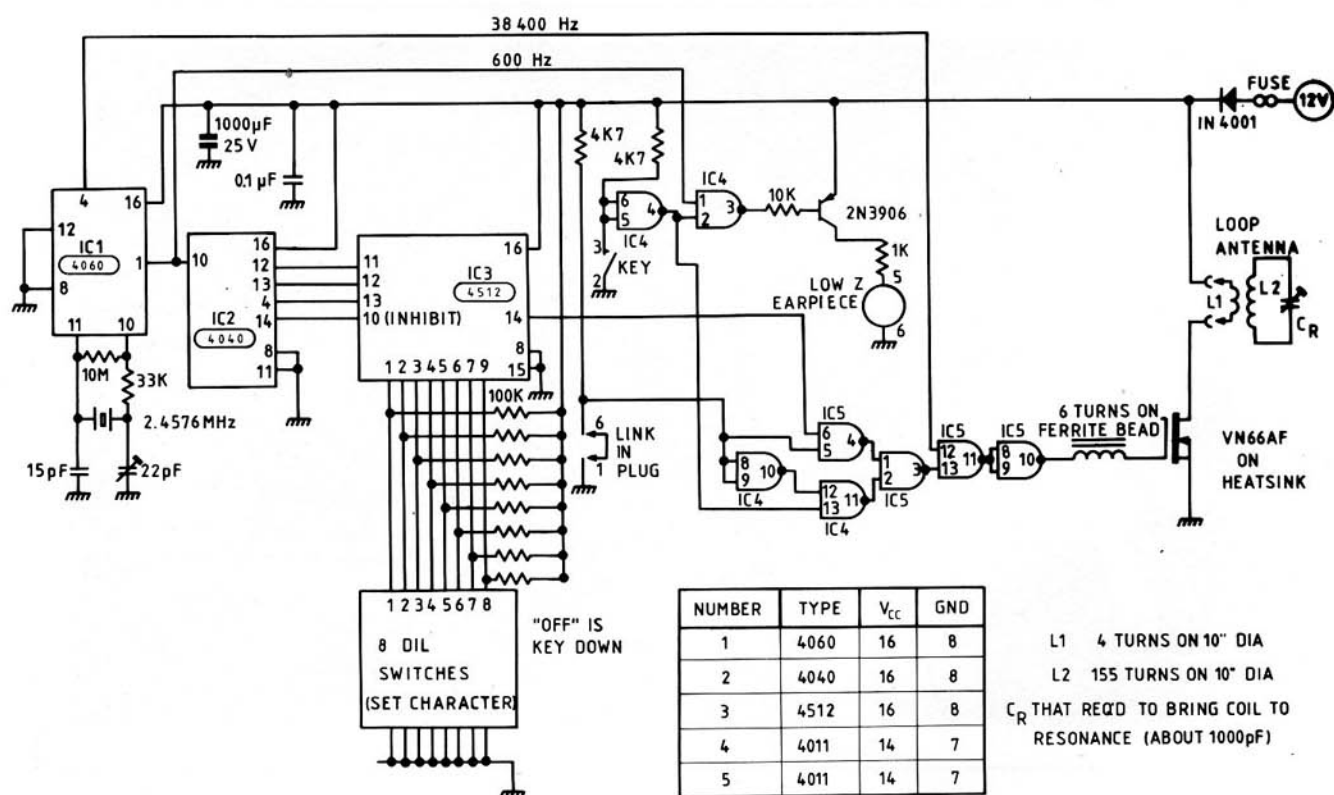


Fig 2. OGOF BEACON TRANSMITTER ANDY BELL 1985

The Transmitter Battery

The transmitter power supply is a 12 Volt sealed lead/acid battery made by Yuasa. The 2.6 Ampere hour type was chosen but one of smaller capacity would do just as well. With hindsight a 12 Volt 1.2 Ampere hour type would have been a better choice because it is lighter, smaller and the full capacity of the 2.6AH battery has never been utilised. This family of batteries has been used to power cap lamps and thus is known to be reasonably hardy. The only modification made in this case was to glue a piece of wood to the top of the battery to make it difficult to short out the battery contacts on the side of a metal ammunition box. Such an occurrence could prove very dangerous indeed. A cable with red and black crocodile clips at one end and red and black insulated terminal plugs on the other is used to supply the power to the Ogof Beacon Transmitter. This cable is about 18 inches in length.

The Transmitter Battery Charger

The Yuasa batteries are charged in a somewhat more sophisticated way than are standard Oldham cap lamps. They must be presented with a constant voltage and a current limited environment. Each member of the family has its own parameters in this respect. Figure 3 shows the circuit used to trickle charge the battery. The preset resistor controls the output voltage and the parallel resistors, Rcl, define the maximum current. For the Yuasa 2.6 AH battery the voltage is set at 14.7 Volt and the maximum current at about 0.65 Amp. It is necessary to consult the manufacturer's data to be sure of using the correct charging parameters.

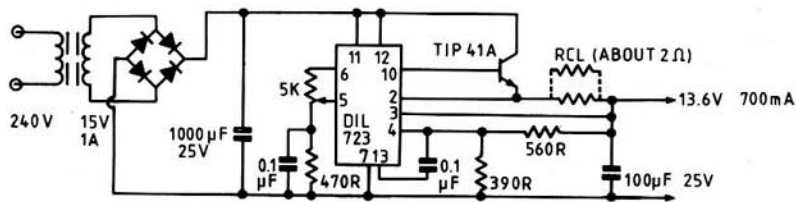


Fig 3. OGOF BEACON TX BATTERY CHARGER ANDY BELL 1985

The Ogof Beacon Receiver

The Ogof Beacon Receiver is rather sophisticated and consequently expensive. The construction and alignment are not a simple undertaking for the inexperienced constructor, the alignment particularly requiring specialised test equipment. The design is based on a high performance radio amateur receiver, of the superhetrodyne type. The circuitry for the receiver was constructed on three double sided printed circuit boards where the top side in each case is grounded. The first board contains RF amplification, crystal controlled local oscillator and crystal ladder filter. The second contains only the two stages of IF amplification and the third contains a beat frequency oscillator (BFO), diode mixer and audio (AF) amplification. Dividing the amplification over different printed circuit boards adds to the stability of the receiver. Fig 4 is a block diagram of the Ogof Beacon Receiver.

The receiver works as follows (see Figure 4a): the 38.4 KHz signal from the tuned loop antenna is fed into the tuned amplifier built around Q1. From here the amplified signal is passed to a mixer built around the dual gate mosfet Q2 where the 38.4 KHz signal is mixed with a 4.469896 MHz signal resulting in a 4.433619 MHz signal, used as the intermediate frequency (IF).

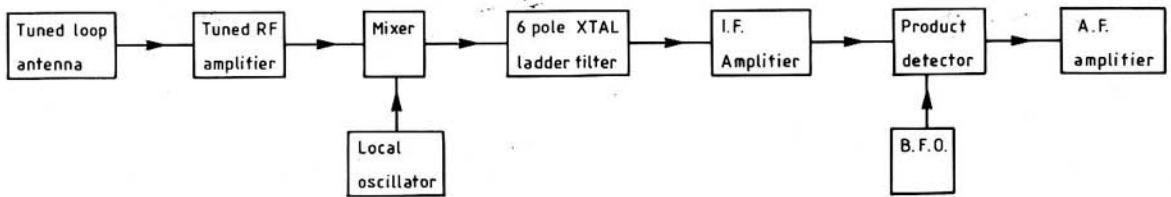


Fig 4. BEACON RECEIVER BLOCK DIAGRAM

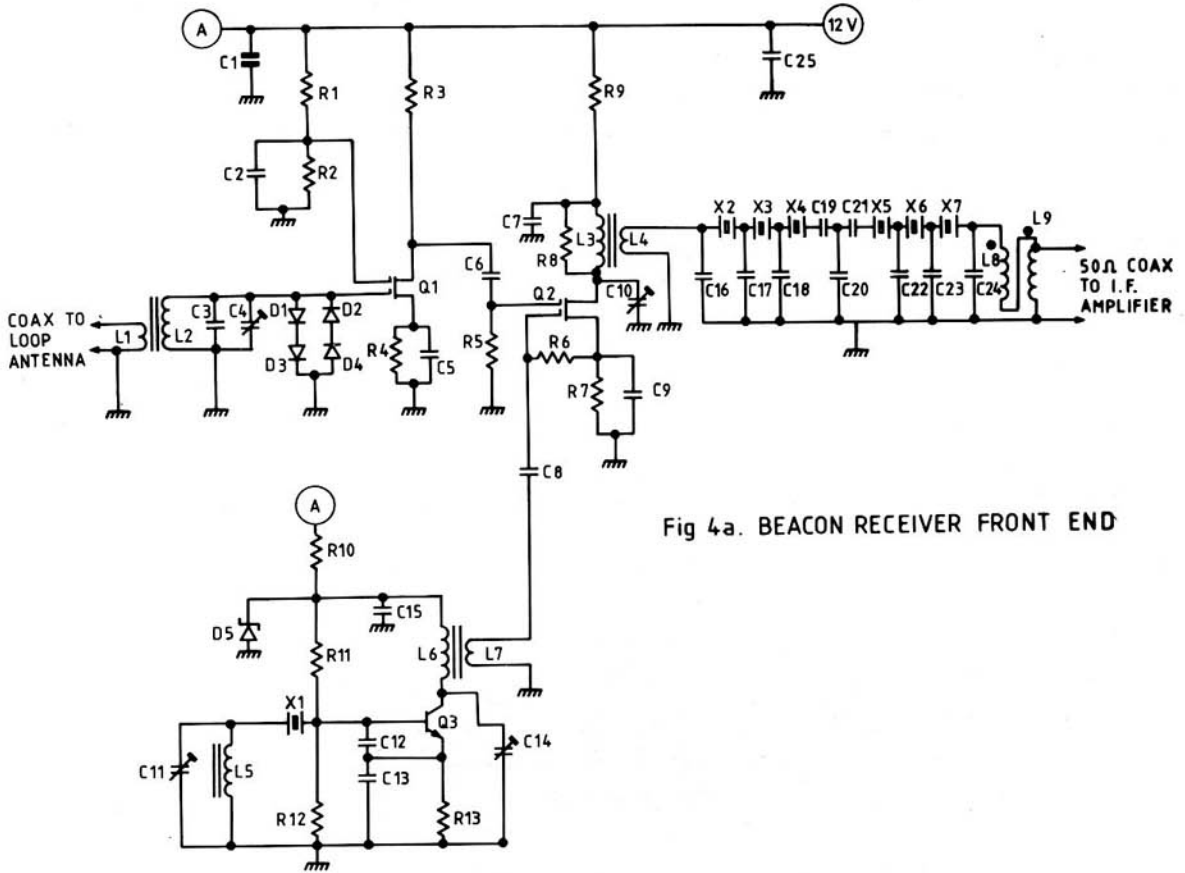


Fig 4a. BEACON RECEIVER FRONT END

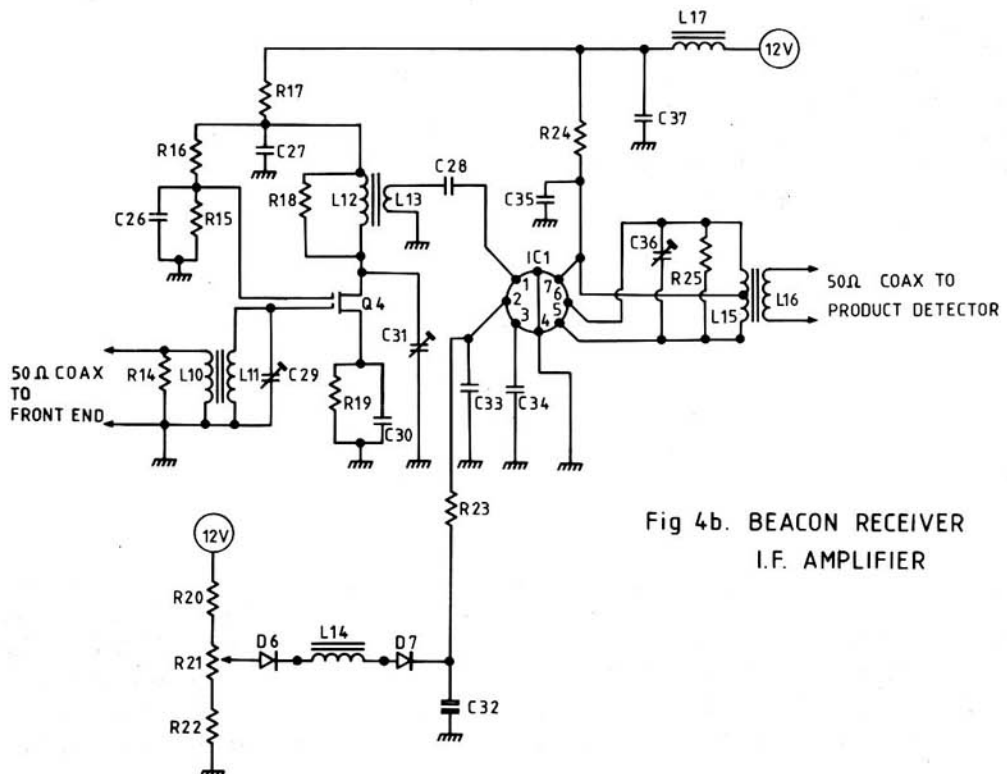


Fig 4b. BEACON RECEIVER I.F. AMPLIFIER

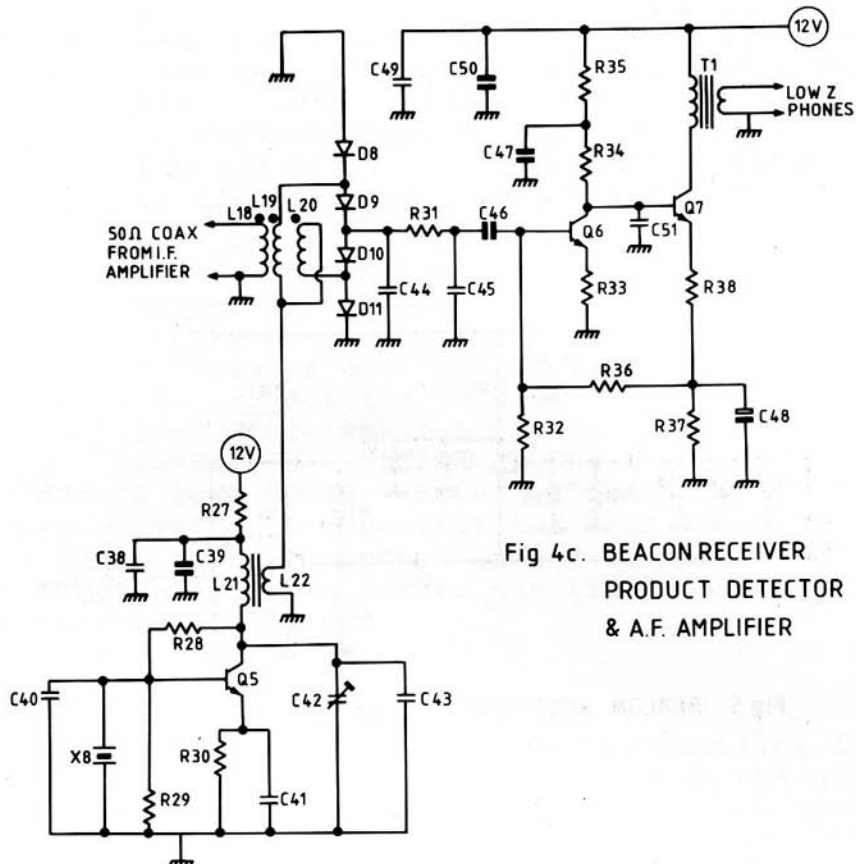


Fig 4c. BEACON RECEIVER
PRODUCT DETECTOR
& A.F. AMPLIFIER

This frequency was chosen for the IF because crystals of this frequency are relatively cheap and easily obtainable, being commonly found in colour televisions. Out of the mixer the signal is passed through a high performance 6 pole crystal ladder filter comprising X2-X7 [6] which passes a bandwidth of about 600 Hz, a bandwidth too narrow to pass speech. A narrow bandwidth filter was used to reduce the amount of background noise thus bettering the signal to noise ratio characteristic of the receiver and so its ability to receive weak signals.

Beyond the ladder filter (see Figure 4b), the signal gets a tremendous amount of amplification from Q4 and IC1. The amount of gain provided by IC1 is governed by R21, the volume control. The by now very much filtered and amplified signal is passed to a diode mixer (see Figure 4c), D8-D11, together with a crystal generated signal of approximately 4.433000 MHz produced by Q5. (The crystal used to provide this was selected from a batch of 4.433619 MHz crystals because it produced a pleasant audio tone in the headphones.) These two signals when mixed together result in a signal of audio frequency which is further filtered, amplified and passed to the headphones.

The receiver has only two controls - an ON/OFF switch and a volume control. It contains a 12 Volt Nicad pack, has an input for the receiving loop antenna via a BNC connector and an output for the headphones via an Ø.25 inch jack socket. It is worth using a pair of good quality communication earphones as their restricted bandwidth will to some extent filter out background noise in favour of the Beacon signal.

No problems have been encountered during operation. It is worth mentioning that the first version of the receiver contained a coil/capacitor variable frequency oscillator (VFO). In practice this section of circuitry was found to be too temperature sensitive and the tuning knob too easy to knock off frequency accidentally. Searching areas of land whilst manually scanning

different frequencies is rather difficult and time consuming and is to be avoided if possible. Figure 5 shows the circuit diagram of the variable frequency oscillator (VFO), which is no longer part of the receiver although it could be used in applications requiring a tunable receiver. Its place has been taken by the fixed frequency crystal oscillator built around X1 and Q3.

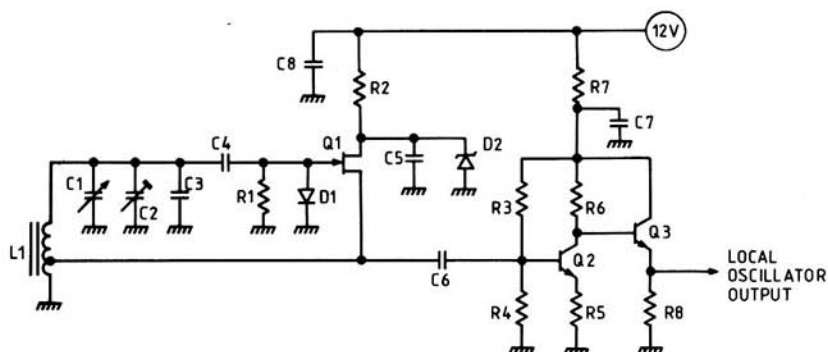


Fig 5. BEACON RECEIVER V.F.O. (NO LONGER USED)

Loop Antennas

If the equipment is to be used for surveying, the construction of the loop antennas must be as accurate as possible. That is to say that all the turns of the coil should lie in a single plane and the coils should be rigid. The loop antennas used for transmitter and receiver can be identical. The loops normally used are less than 12 inches in diameter when complete and were wound on a 10.5 inch former (a Boots brewing bucket was a convenient size). The coil was brought to resonance by placing capacitors across it. The capacitors are contained in a small plastic box mounted on one end of the cross that supports the loop antenna. The coils were completely enclosed in self amalgamating insulating tape, which was then varnished. When complete the outside diameter was 11.5 inches.

The transmitter loop was then given extra protection against the cave environment by winding polypropylene string around the coil perpendicular to its axis. This was covered in liquid rubber (Flexane 60) and then again covered in tape and varnish. Both loop antennas were finally mounted on wooden crosses to keep them rigid and give some further protection. The wooden cross should be assembled with no metal screws or nails and the coil must be mounted with nylon ties rather than metal fixings. The presence of metal near the antenna would distort its accuracy. A good halving joint was used to make the wooden cross and dowels can be used to increase its strength. The wood should be well painted or varnished before any components are fixed on it. It should be remembered that the wooden cross will take much of the rough cave treatment, thus protecting the loop itself.

The Beacon is perhaps unique among radio location devices in using such small antennas. They were so designed in order that they could be transported easily in the form required for operation. A bigger loop might be a more efficient radiator, but the size would create other problems. If the loops were bigger then they could not be set up in small passages and they would have to be transported folded and erected at site where they would probably need to be tuned to resonance.

The Transmitter Loop Antenna

The completed coil is mounted on its wooden cross together with a small plastic box holding the capacitor and connector to which the 300 ohm feeder attaches and links the loop antenna to the transmitter. The value of this capacitor can only be found by experiment because differing wire diameters and winding tensions will give rise to coils of differing inductances. In this case an oscilloscope was used with the earth on the probe shorted to the probe itself to represent a 1 turn coil. This was then held near to the loop which was connected to the transmitter. For initial tuning a 4K7 Ohm resistor was inserted between the transmitter and loop antenna to protect the VMOS output stage. The capacitor value was adjusted for maximum pickup and symmetry on the oscilloscope. **BEWARE: THE VOLTAGE AROUND THE CAPACITORS MAY WELL BE IN EXCESS OF 2000 VOLTS - SUCH A VOLTAGE COULD PROVE FATAL.** When the correct value of capacitor has been determined, a small amount of silicon rubber compound should be deposited around the joint of the antenna box before the lid is screwed on in an attempt to waterproof the box.

The Receiver Loop Antenna

The receiving loop is identical to the transmitting loop except that lower voltage (and cheaper) capacitors can be used to bring the loop to resonance. In our case a 400pF preset type was used. With the transmitter operating several meters away, the receiver loop was brought to resonance by monitoring the receiver output on an oscilloscope whilst tuning its 400pF capacitor. Extra padding capacitors may also be necessary if the required capacitance exceeds 400pF.

One other difference from the transmitting loop is that the receiving loop is terminated in a BNC connector because a screened lead must be used to join the loop to the receiver. The wooden frame for the receiver loop is fitted with a protractor and plumb line which are used in determining the depth of the location site (see below).

The Large Receiving Loop

A large receiving loop was made especially for difficult applications where perhaps the location site is deeper than usual and interference makes reception harder. The former for this coil was a length of plastic curtain rail which was bent around into a circle and superglued into position. (The plastic curtain rail must of course contain no metal.) The diameter of the large receiving loop is 34 inches, it is 1 inch long and contains 100 turns. Once again, the inductance of each loop constructed will vary a little, so the value of the capacitor required to bring the loop to resonance has to be found by experiment.

This loop is mounted on a wooden frame inside which the operator can walk, the frame being suspended from the operator's shoulders by webbing. Like the smaller receiving loop it has a protractor and plumline attached so that angles can be read off and thus the depth of the transmitter calculated.

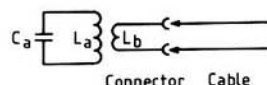


Fig 6. CIRCUIT DIAGRAM OF
ALL LOOP ANTENNAE

Transmitting loop

Ca About 1000 pF 4000V using series/parallel combinations of fixed capacitors to achieve resonance.
La 150 turns of 7/0.2 wire of diameter 10.5 inches.
Lb 4 turns over La.
Connector RS 444-517 mounted on the plastic box containing the capacitors.
Cable About 18 inches 300 Ohms parallel feeder to transmitter.

Small receiving loop

Ca 400 pF preset trimmer (and parallel fixed capacitor if required) adjusted to bring coil to resonance.
La 150 turns of 7/0.2 wire of diameter 10.5 inches.
Lb 4 turns over La.
Connector BNC mounted on plastic box containing capacitor(s).
Cable 3-4 feet of 50 Ohm coax to receiver.

Large receiving loop

Ca 400 pF preset trimmer (and parallel fixed capacitor if required) adjusted to bring coil to resonance.
La 100 turns on a 34 inch diameter former.
Lb 3 turns over La.
Connector BNC mounted on plastic box containing capacitor(s).
Cable 3-4 feet of 50 Ohm coax to receiver.

Ogof Beacon Monitor

At the request of cavers who were setting up the Beacon transmitter underground, a small device for checking that the Beacon is really transmitting was designed and built. This consists of about 100 turns of 26 swg enamelled copper wire wound around a 450 gm yogurt carton. The coil so formed, of diameter 90 mm, was slid off the yogurt carton and a LED connected across its two ends. The whole assembly was then encased in plastic padding leaving the tip of the LED visible just beneath the surface of the plastic padding. (It is useful to extend the tip of the LED temporarily with plastercine.) In the first model built the LED stood proud of the surface and got broken off.

In use this device is merely held a foot or so above the centre of the transmitting loop antenna and if the Beacon is transmitting the LED will be seen to flash in time with the morse code.

Choice of Connectors

The choice of connectors for the underground equipment proved to be difficult in that most waterproof connectors are very expensive. After considerable searching we chose a series of connectors which would not allow water to pass through them into the equipment.

We used 2mm plugs and sockets (RadioSpares type 444-517 & 444-450) to effect connection between transmitting loop antenna and transmitter. Insulated terminals (RS 423-201 & 423-239) were used to connect the battery to the transmitter. Finally we used a 7 pole connector from Farnell, (type 147076 & 147079) with a little araldite to increase the water proofing, to bring out the morse key and earphone signals.

Locating an Underground Spot

The Transmitter

The underground party sets up the transmitter at the chosen site at a prearranged time. It is particularly important that the

transmitting loop be perfectly horizontal because an error of a degree or two can turn out to represent several metres on the surface. A bubble level device is needed for the accurate placement of the transmitting loop. The transmitter is connected to the loop antenna and then the battery connected to the transmitter. The Beacon Monitor is then held near the transmitting loop in order to check that the Beacon is operational. Ammunition boxes, bubble level and Beacon Monitor are moved away from the transmitting loop and the Beacon is then allowed to transmit for the agreed period.

The Surface Party

The surface party must consist of a minimum of two or preferably three people carrying in addition to the receiver and loop(s) the following equipment: at least two ropes, a tape measure, paper pencil, and perhaps a stake to mark the spot. The Beacon signal can normally be received without difficulty from at least 100 metres away, but the exact location is usually found by nulling the signal, ie. finding the direction in which it is weakest or completely absent. The receiver operator searches for a null by turning the loop antenna so that it lies in a vertical plain. The operator holding the loop then rotates through 180 degrees searching for a null. When this has been found a rope is laid along the line of the loop antenna. This process is repeated from several different positions and the location of the transmitter will lie directly under the interception of all the ropes. In reality, using three ropes, there will be a small "triangle of error" which represents some uncertainty. At depths of 20 metres this uncertainty may be represented by a circle of error of about 1 foot diameter, whereas at 80 metres depth the circle will be larger.

Depth Measurement

The receiver operator takes up a position some distance from the located point. Holding the loop horizontal the operator dips the front of the loop down towards the ground until a null is obtained. The angle at which the null occurs is read using the protractor and plumb line. (A second person is useful for this.) The distance from the loop to the location point (in the centre of the circle of error) is measured. This together with the angle enable the depth of the transmitter to be calculated from a known formula [4 page 46] or looked up on a graph or in a set of tables [4 page 54].

When measuring the depth of an underground spot three different vertical measurements may actually be involved:

- 1 The depth of the Beacon underneath the point where the ropes cross on the surface.
- 2 Any extra height lost or gained on the surface because the ground is not level and it is necessary to walk up or down hill to measure the angle of null at the offset.
- 3 The height of the centre of the receiving loop above the ground at (2) when the measurement is taken.

To allow for these factors the following calculations are applied:

- 1 Pythagoras' Theorem is applied to obtain a corrected offset.

2 The formula in [4] is applied to obtain the depth from the centre of the receiving coil when the null reading is taken

3 The various heights/depths are combined to give the depth of the Beacon beneath the point where the ropes cross.

A small BASIC program summarises this:

```
10 PRINT "Angle";
20 INPUT A
30 PRINT "Measured offset";
40 INPUT F
50 PRINT "Extra height at offset";
60 INPUT E
70 PRINT "Measurement height above ground";
80 INPUT H
90 F1=SQR(F^2-E^2)
100 GOSUB 150
110 LET D1=D-E-H
120 PRINT "Depth at marker=";D1
130 PRINT
140 GOTO 10
150 LET A1=(90-A)/180*PI
160 LET B1=SQR((9*TAN(A1)*TAN(A1))+8)
170 LET D=2*F1/(B1-(3*TAN(A1)))
180 RETURN
```

Full accounts of the theory behind electromagnetic induction and cave surveying will be found in earlier articles [1-4].

Experiences with the Ogof Beacon

The Beacon was first tested in Cwm Dwr early in February 1985. Anne took the transmitter to the far end of the large sandy passage which forms a right fork off the usual route into the Cwm Dwr Crawl. The surface party (Andy) did not attempt a precise location or depth measurement but was merely overjoyed to hear the signal at all through about 10 metres of rock! As it was snowing hard we retired to the Club for tea. The following weekend we planned a proper trial - location of Boulder Chamber, OFD I. Judicious negotiation with two parties doing through trips in opposite directions enabled us to get the transmitter taken in and brought out without the necessity of going caving ourselves. (Our thanks to the two parties concerned.) Bob Radcliffe was the third member of the surface party. While it was not snowing this time, there was high wind and snow and ice on the ground. On this occasion, inexplicably, we never did hear the Beacon.

The following week Bob Hall asked if we could attempt to locate the Up Stream Choke, Cwm Dwr. With no equipment modifications whatsoever the whole operation went perfectly and we obtained a fix on the transmitter at a depth of about 30 metres. From this time on we have experienced no failures other than being unable to locate exactly The Smithy, OFD II, in gale force wind and rain as the spot was somewhere under the steeply sloping outcrop to the south of the Club.

In association with the Royal Forest of Dean Caving Club we have carried out several locations near Sump II in Otter Hole where the object of the exercise was to find the position of Sump II with respect to the surface. In each case John Elliot was responsible for carrying the equipment into the cave and setting it up. With the loop antennas orientated for a maxima the signal was strong and could be heard over a wide area (at least 200

metres away). In all of the locations, the observed nulls were wide and interference from atmospheric disturbances was heavy. We did two depth measurements and the Beacon indicated the depth of the sump below the surface to be 85 and 91 metres respectively. In February 1986 a 15 inch borehole was sunk at the point identified by the Beacon as being directly above Sump II, which is in fact on Chepstow Racecourse not far from the Piercefield PH. The borehole did hit water and is believed to have entered Sump II, but this can only be verified by diving, and has yet to be attempted. The depth of the borehole was 94.5 metres which reveals an error of about 7% in the Beacon measurements.

We have also taken two sets of readings in Smith's Armoury, OFD III. Our readings here gave an average depth of 79 metres (259 feet) for Smith's Armoury, a figure which disagrees with measurements previously carried out: "depth about 200 feet (199 feet and 217 feet from 2 tests)" [7].

Perhaps the most comprehensive use of the Beacon to date has been as an aid to the surveying of the Northern Lights [8]. In this case Bob and Jenny Peat found that the results obtained by the Beacon agreed with those they had obtained by conventional surveying.

It is difficult to quantify the range of the Beacon because no signal strength readings have been taken, and neither has the receiver sensitivity been measured. However, experience has shown that reasonable nulls can be obtained at depths of 80 metres and at such depth the signal was "strong" when the transmitting and receiving loop antennas were alligned for a maxima signal.

Acknowledgements

For assistance in design and technical discussions, radio amateurs Alan Ibbetson(G3XAG) and John Bird(G3GIH) together with Roger Smith of SWCC. Thanks to Hugh Rice for redrawing the circuit diagrams.

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Ogof Beacon Receiver Components

<Front End>

R1 100K
R2 33K
R3 2K2
R4 120R
R5 100K
R6 10K
R7 120R
R8 10K
R9 120R
R10 470R
R11 22K
R12 10K
R13 470R

<IF Amplifier>

R14 51R
R15 33K
R16 100K
R17 100R
R18 10K
R19 100R
R20 10K
R21 5K6
R22 10K variable (gain control)
R22 10k
R23 5K6
R24 120R
R25 3K9

<AF Board>

R27 120R
R28 10K
R29 4K7
R30 470R
R31 1K
R32 10K
R33 22R
R34 6K8
R35 1K
R36 18K
R37 180R
R38 47R

C16 180 pF polystyrene
C17 270 pF polystyrene
C18 330 pF polystyrene
C19 1500 pF polystyrene
C20 330 pF polystyrene
C21 1500 pF polystyrene
C22 330 pF polystyrene
C23 270 pF polystyrene
C24 180 pF polystyrene
C25 0.1 uF disc ceramic

<IF Amplifier>

C26 0.1 uF disc ceramic
C27 0.1 uF disc ceramic
C28 10 nF disc ceramic
C29 400 pF preset
C30 0.1 uF disc ceramic
C31 400 pF preset
C32 1uF 16V tantalum
C33 10 nF disc ceramic
C34 10 nF disc ceramic
C35 0.1 uF disc ceramic
C36 400 pF preset
C37 0.1 uF disc ceramic

<AF Board>

C38 0.1 uF disc ceramic
C39 100 uF electrolytic
C40 47 pF polystyrene
C41 330 pF polystyrene
C42 40 pF preset
C43 47 pF polystyrene
C44 0.1 uF disc ceramic
C45 0.1 uF disc ceramic
C46 3.3 uF electrolytic
C47 22 uF electrolytic
C48 47 uF electrolytic
C49 0.1 uF disc ceramic
C50 1000 uF 16V electrolytic
C51 0.1 uF disc ceramic

D1-D4 1N914
D5 9V1 zener
D6-D11 1N914

<Front End>

C1 100 uF 16V elect
C2 0.1 uF disc ceramic
C3 560 pF polystyrene
C4 400 pF preset
C5 0.1 uF disc ceramic
C6 0.1 uF disc ceramic
C7 0.1 uF disc ceramic
C8 0.005 uF disc ceramic
C9 0.1 uF disc ceramic
C10 400 pF preset
C11 400 pF preset
C12 100 pF polystyrene
C13 220 pF polystyrene
C14 400 pF preset
C15 0.1 uF disc ceramic

Q1 3N201
Q2 3N201
Q3 2N2222A
Q4 3N201
Q5 2N3904
Q6 BC109
Q7 BC109

IC1 MC1590

X1 4.469896 MHz
X2 4.433619 MHz
X3 4.433619 MHz
X4 4.433619 MHz

X5	4.433619 MHz	C3	1000 pF polystyrene
X6	4.433619 MHz	C4	15 pF polystyrene
X7	4.433619 MHz	C5	0.1 uF disc ceramic
X8	4.433619 MHz (nominal)	C6	10 pF polystyrene
		C7	0.1 uF disc ceramic
		C8	0.1 uF disc ceramic

<Front End>

L1	100 turns on FX2236	L1	15 turns on T50-2
L2	3 turns over L1		
		D1	IN916
L3	36 turns on T50-2	D2	6V2 400 mW zener
L4	3 turns over L3		
		Q1	MFF102
L5	40 turns on T50-2	Q2	2N2222A
		Q3	2N2222A
L6	42 turns on T50-2		
L7	10 turns over L6		
L8	4 turns bifilar wound with L9 on FX2633		
L9	see L8		

<IF Amplifier>

L10	6 turns on T50-2
L11	32 turns over L11
L12	32 turns on T50-2
L13	6 turns over L12
L14	10 mH choke
L15	36 turns centre tapped on T50-2
L16	6 turns over L15
L17	10 mH choke

<AF Board>

L18	1.5 turns trifilar wound with L19 and L20
L19	1.5 turns (see L17)
L20	1.5 turns (see L17)
L21	43 turns on T50-2
L22	5 turns over L21
T1	LT800 (Maplin primary 1k2, secondary 8R)

Superceeded VFO Components

R1	100K
R2	330R
R3	10K
R4	220R
R5	330R
R6	1K
R7	47R
R8	470R
C1	25 pF air spaced variable (Jackson)
C2	40 pF preset

X-Ray Analysis of the Dan-yr-Ogof Galena

As many people are probably aware, there is an ore vein located in Gerard Platten Hall in Dan-yr-Ogof. Although the vein is difficult to locate in the passage wall, plenty of the boulders which have fallen to the floor have Galena (PbS) disseminated through them. Last summer I obtained a sample with the plan of making an X-Ray diffractogram to obtain the true mineralogical composition (fig. 1).

As can be seen the strongest peaks were those of Galena, (PbS), Anglesite, (PbSO₄), and Cerussite, (PbCO₃). These were the strongest peaks; there were also minor peaks of Sphalerite (ZnS), (Zinc Blende), and Calcite.

The existence of these ores in limestones is not uncommon. The solubility of limestones allows them to become excellent reservoirs for migrating fluids. The cave systems are places where the ore fluids can reach favourable conditions to precipitate. Another reason for the limestones being an excellent fluid reservoir is the increase in porosity caused by dolomitisation, due to the fact that dolomite crystallizes as a rhombohedron, invariably smaller than the original calcite, and actually produces pore space, a volume change of 12 to 13%.

Although in the Cil-yr-ychen limestone, only selected beds are dolomitised, this all occurs in a section of cyclic sedimentation that contains much evidence of being deposited in shallow water (Neville-George 1970). The dolomites were the result of two possible mechanisms: evaporative reflux, or dorag dolomitisation. Evaporative reflux is the concentration of ions from evaporation in the intertidal zone. Dorag dolomitisation is the mixing of fresh and marine waters to produce the mineral. Both of these types are primary dolomites. It could also be of secondary origin, due to diagenesis or migrating fluids transported during a period of tectonic activity. The problem of how dolomitisation is achieved is still perplexing, but progress has been made by studying the fluid inclusions and determining paleotemperatures, and by studying the stable isotopes, (oxygen and carbon). Neville-George (1970) suggests that the Carboniferous age rocks were buried to a considerable depth, before being eroded to another landscape, suggesting a diagenetic origin, but there is also evidence that the Cil-yr-ychen is a limestone formed in a shallow shelf environment opening the possibility that the dolomite originated earlier.

An isotopic study of the Dan-yr-ogof lead could produce some ideas of its origin. It is suggested by Neville-George (1970), that it may have been emplaced by a late stage phase of orogenic hydrothermal injection, of Hercynian age. The lead could have originated as one of many isotopes of uranium or thorium in early crustal rocks.

The affinity of lead and zinc sulphides to limestones leads to even more idle thoughts, they are, - Could the famous "Blue Stal" be Smithsonite (ZnCO_3)? The chance of the Zn^{2+} substituting for Ca^{2+} will depend on the temperature of the carrying solution, and the relative sizes of the two ions, (a <15% difference in ionic size) precipitation of one or the other depends on the solubility product constants of the two minerals, and temperature and pressure. The idea of Smithsonite came from the fact that this mineral is often blue, on the other hand it could be just blue calcite. The blue colour being caused by partial substitution of Ca^{2+} by Zn^{2+} , or some other divalent suitably sized cation. Another possibility could be Azurite, $\text{Cu}_3(\text{CO})_3(\text{OH})_2$, which is another blue mineral with some of the right credentials.

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Table 1.

X-ray data from sample of Galena from Gerard Platten Hall
Dan-yr-ogof.

Instrument: General Electric.

Voltage - 45 Kvp

Current - 22 ma

Copper radiation - 1.54050 angstroms

The following data summarise the diffractogram.
(an illustration of which is included as figure 1)

(Major peaks only)

<u>2-theta angle</u>	<u>d spacing</u>	<u>mineral</u>
24.9	3.5728 A	Anglesite/Cerussite
26.05	3.4167 A	Anglesite/Galena
30.2	2.9568 A	Galena
36.4	2.4661 A	Cerussite/Acanthite
42.2	2.1396 A	Anglesite
51.05	1.7875 A	Anglesite
53.8	1.7025 A	Anglesite
62.75	1.4794 A	Galena/Anglesite
69.15	1.3573 A	Galena
71.2	1.3232 A	Galena
77.4	1.2360 A	Sphalerite
79.1	1.2097 A	Galena

A = angstroms

relationship $n \times 1.54050 = 2 \times d \times \sin(\theta)$

n = 1,2,3 etc.

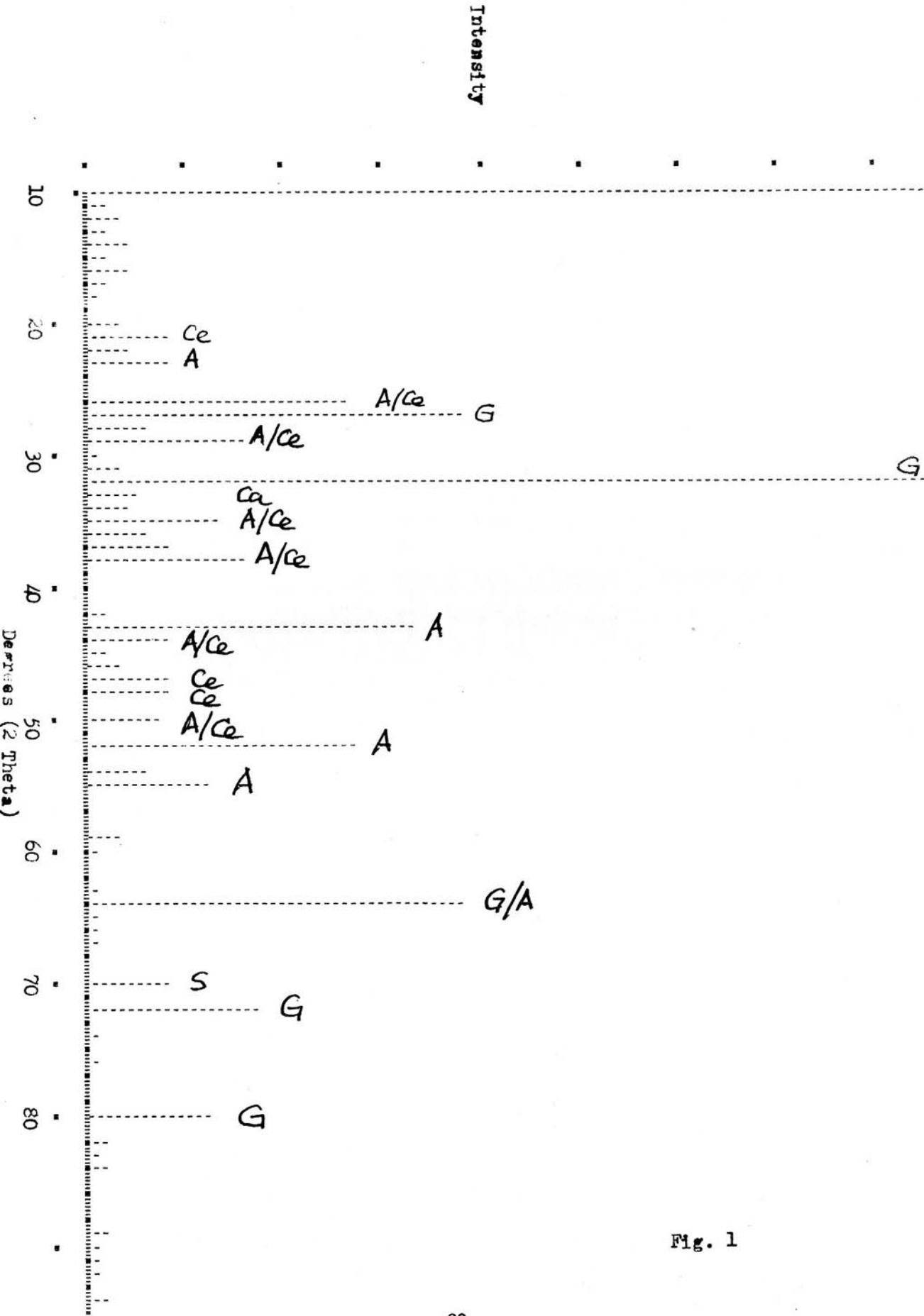


Fig. 1

References

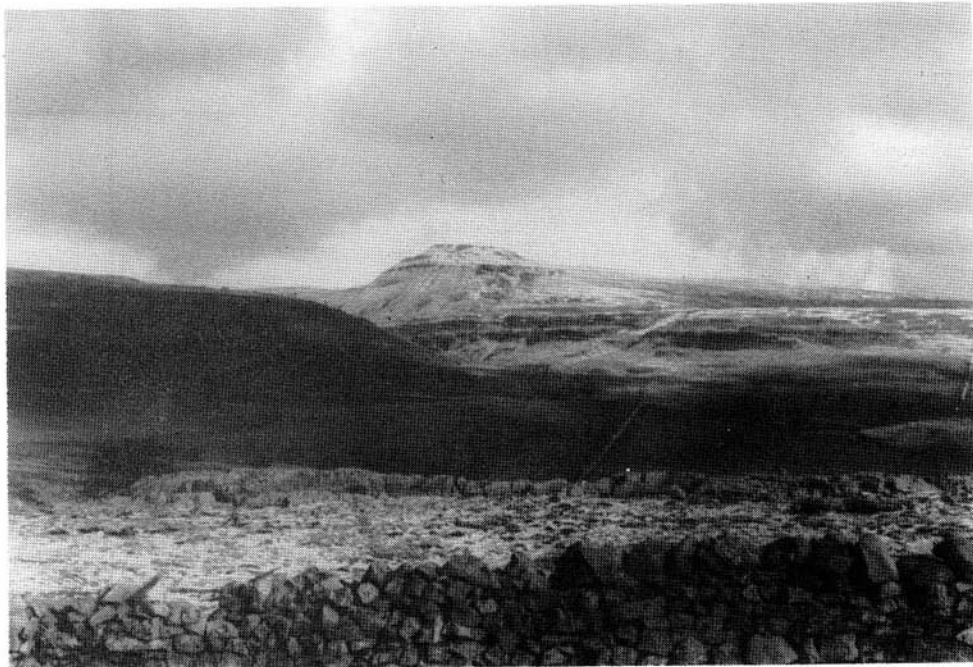
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CLUB TRIP NORTH, EASTER 1986

The cover photograph of this Newsletter shows just how happy SWCC is when it gets to Yorkshire and Lancashire. Despite blizzards, sleet, gale force winds, etc., an enjoyable time was had by all. The beer was excellent and the pubs even more cosy.

Photographs below and overleaf:

1. Ingleborough Hill from Kingsdale.
2. The path up to the Turbary road in Kingsdale.
3. Bull pot farm after a very pleasant jolly through Lancaster hole.
4. Rowten pot.





1



2



3

SOUTH WALES CAVING CLUB INCOME AND EXPENDITURE ACCOUNTS FOR YEAR 1985/86

EXPENDITURE 1-2-85 TO 31-1-86			INCOME 1-2-85 TO 31-1-86		

HQ EXPENSES					

COTTAGES	631.73		HQ FEES	3756.10	
OIL	1656.00		SHOWER BOX	292.19	4048.29
ELECTRICITY	217.65				
GAS	186.20		SUBSCRIPTIONS	2571.50	
EXPENDABLES	157.38		TELEPHONE	173.00	
INSURANCE	554.40	3403.36	DONATIONS	300.67	3045.17
CLUB EXPENSES					

SECRETARY	93.06		SALES		
EQUIPMENT	769.59		-----		
DUMPER	575.00		SURVEYS	345.35	
TELEPHONE	493.11		POSTERS	48.20	
EDITOR	776.74		BOOKS	169.60	563.15
RECORDS/LIB.	287.97		G.W.COLLECTION	307.25	
DIG EXP.	81.26		MISC.	23.34	330.59
BANK CHARGES	104.68	3181.41			
PUBLS. FOR SALE					

SURVEYS	517.50		INTEREST	1241.43	1241.43
BOOKS ETC.	49.00	566.50			
CEILIDH	446.00	446.00	CEILIDH	586.24	586.24
MISCELLANEOUS					

P.W.U.A.	25.00		PIG ROAST(PROFIT)	133.00	133.00
SOLIC.FEES(WATER)	407.78		N.B. PROFITS FROM CEILIDH		
CAVE LOCKS	101.47		AND PIG ROAST TO CAVE RESCUE		
MISC.	102.08	636.33			
CAVE RESCUE					

RAFFLE	132.65		CAVE RESCUE		
LAMP PURCHASE	630.00		-----		
HALF PROF.(GWENT)	194.25		RAFFLE	976.09	
RADIOS ETC.	150.00		LAMP SALES	1018.50	
1ST AID COURSE	136.00		MISC. LAMPS	87.86	
LAMPS+CHARGER	140.35		1ST AID COURSE	140.00	
LANDROVER	486.38		LAMP HIRE	147.00	
MISC.	279.22	2148.85	DONATIONS ETC.	611.23	2980.68
TOTAL EXPENDITURE					
		10382.45	TOTAL INCOME		12928.55
EXCESS INCOME/EXPENDITURE					
		2546.10			

SOUTH WALES CAVING CLUB STATEMENT OF ASSETS AT END OF YEAR 1985/86

STATEMENT OF ASSETS

MONETARY ASETS AT 1-2-85

MIDLAND BANK	1893.55	
P.O. INVESTMENT	9893.93	
INCOME O/S	478.09	
LESS CHEQUES U/P	267.31-	11998.26

COMPOSITION.

C.R.O. FUND	719.99	
CONS. FUND	1276.91	
H.Q. REPAIRS	1733.36	
GENERAL FUND	8268.00	11998.26

MONETARY ASSETS AT 31-1-86

MIDLAND BANK	1316.07	
P.O. INVESTMENT	13635.36	
INCOME O/S	90.74	
LESS CHEQUES U/P	497.81-	14544.36

COMPOSITION.

C.R.O. FUND	1897.06	
CONS. FUND	1404.60	
H.Q. GENERAL	2106.70	
H.Q. ROOF	5000.00	
BALANCE	4136.00	14544.36

PREMISES AND EQUIPMENT

COTTAGES (COST)	200.00
GARDENS ..	750.00
STUMP ..	25.00
GARAGE ..	15.00
LANDROVER(1981)	500.00
DUMPER (1985)	575.00
TRAILER (1982)	100.00
DUPLIC. (1984)	50.00
TYPEWR. (1980)	120.00

EQUIPMENT

1985 VALUE	3796.06
LESS 10% DEP.	379.60-
PURCHASES	769.59
1986 VALUE	4186.05

ACCOUNT BALANCES

C.R.O. FUND

BALANCE 1-2-85	719.99
INTEREST	72.00
INCOME	3253.92
LESS EXPENDITURE	2148.85-

BALANCE 31-1-86 1897.06

CONSERVATION FUND.

BALANCE 1-2-85	1276.91
INTEREST	127.69

BALANCE 31-1-86 1404.60

H.Q. GENERAL REPAIR FUND

BALANCE 1-2-85	1733.36
INTEREST	173.34
TRANSFER	200.00

BALANCE 31-1-86 2106.70

H.Q. ROOF REPAIR FUND

BALANCE 31-1-86 5000.00

SECRETARY'S REPORT

Once again I have to report another year without any major finds of new cave or extensions within known caves. The appalling summer restricted digging activities severely, although a considerable amount of effort has been put into digs in the Herberts' Quarry area. Members have, however, been instrumental in extending the Daven Cilau system further and in exploring a new cave found in the grounds of 'Minerva'. This is apparently about 700m in length to a sump, and is clearly of recent origin in comparison with OFDI.

The prolonged cold spell in February caused the sump in Ogof Ffynnon to open once more, and two trips by SWCC members extended this new series to about 450m. Interestingly, the passage tends towards the Hepste rather than the Mellte, and draughts strongly inward throughout its lengths. All may (perhaps) be revealed next winter.

The bore hole in Cwm Dwr quarry was somewhat enlarged over a Bank Holiday weekend, when a shaft 5m deep was sunk. However, although the local quarry management had been duly consulted, higher management then banned the project from continuing. Negotiations are still proceeding and it is possible that permission to continue may be obtained this summer. Cwm Dwr Quarry Cave itself will come under the OFDII Permit System from 1st May, now that the Nature Conservancy Council lease of the land is in effect. The NCC have also bought a section of the railway line including that at the bottom of the Garden.

The Cave and Crag Club have renegotiated their lease of Pant Ifan in North Wales, and SWCC Members reciprocal rights now extend to the use of this cottage. On Membership, I am delighted to report that 40 Provisional Members have joined during the year. Sadly many familiar names are now missing from the Membership List, but nevertheless the total membership has grown slightly to about 320. Prospects for the future look good, with an exceptionally large crop of potential cavers enlivening Members' households.

Returning to familiar ground, the Duty Officer system has been effectively inoperative since Christmas, due to a lack of volunteers. This chore therefore falls upon the same few, time upon time. Not only is this clearly unfair, but it must be said that the Club runs less efficiently as a result. It is the **duty** of members to take their turns, please do your duty and volunteer. No workable alternative has yet been suggested.

Whatever the failings of the Duty Officer system, I shall not be haranguing you upon the subject next year. After four years as Secretary, I feel it is time to retire, both for my own and for the Club's benefit. I feel that Senior Officers should not remain in post for too long, since they inevitably become 'stale'. Accordingly, I do not offer myself for election to any Committee post. May I take the opportunity to thank all those whose co-operation and active assistance has made my job as Secretary possible over the last four years.

S. A. Moore

ASSISTANT WARDEN'S REPORT 1985 - 6

Regular visitors to the club will have noted the continued absence of the elected Warden, so this task has fallen to myself.

Progress on the proposed utility block has been slow along with production of drawings for the new porches. The old rubbish store was quickly demolished and the general area around the club has been made tidy, with the aid of a dumper truck purchased shortly after last year's AGM. All the stone rubbish being used to help fill the 'hole by the Stump'. A new front door has been fitted, but needs the protection of a porch or it will not last.

Work still to be carried out includes rebuilding the water tank, hopefully done at Easter and the replacement of the rotten window frames about the club. All these require rather better weather than we had last summer.

I extend my thanks to everyone who has helped with the general work around the cottage, especially all those who helped in the cleaning of the septic tank. With special thanks to Toby for his solitary work, in the pouring rain, to get it working again.

If required I am prepared to continue as warden for a further term, and hopefully see all the outstanding work completed.

Chris Pepper

EQUIPMENT OFFICER'S REPORT

Our present tackle situation is quite healthy. On the plus side, 300 feet of ladder and assorted tethers were purchased at a very favourable price and after treatment have been stored as a hedge against inflation. Arrangements have also been made to buy new lifeline and the existing lifeline colour coded for length.

Thanks to Bill Gascoine, a number of Oldhams lamps were bought for resale and I managed to arrange the donation of a quantity of cap lamp cable. Profits from the sale of these and any spares that are obtained go to S.W.C.R.O.

I am attempting to reclaim some of the unfinished pin and araldite ladders that failed in manufacture a couple of years ago and another project under way is to revamp the Oldham charging racks.

Now the debit side! All three survey tapes have been lost or damaged and a clino and compass needed repair. These are expensive items and should be treated with care. Two tackle bags and a ladder were lost from the store and four more ladders were withdrawn from use due to corrosion caused by battery electrolyte or similar substance. The above losses have probably cost the club (you!) £250 or more.

There has been a general clear out of rubbish and any dubious lifeline or other tackle has been disposed of.

I have repaired and obtained quite a lot of digging tools. The limestone in this area consumes these at a surprising rate and I would ask diggers to return tools when they abandon digs. I often wonder what future generations of archeologists will make of the collections of ironmongery secreted around the hills and caves!

It was agreed that, due to the problems of caring for SRT rope that is freely available from the tackle store, only a small quantity will be kept in stock. Larger amounts for club expeditions will be purchased as required.

I would like to thank all those who have helped over the last year and, finally, plead the perennial pleas of the tackle officer. Use the tackle correctly and look after it - if you don't value your neck too highly, you might at least consider other people. Please clean tackle after use and return it in good condition.

Nick Geh

HON. RESCUE OFFICER'S REPORT 1985 - 6

During the year we have attended to seven rescues and two animal recoveries. The most serious was last August Bank Holiday when an eleven year old boy fell down 'President's Leap' and incurred serious head injuries. His evacuation was speedy and successful and recovery complete and quick.

Two callouts were for overdue parties, but by far the most prominent were four callouts for Little Neath River Cave. The last two of these have proved to be very controversial. Repeatedly what happens is that the Fire Brigade receive the call before we do and attempts to build a diversionary dam are made. Damage to the farmer's field and hedge has resulted. Last December, however, water levels were too high for this to be feasible. Divers were called in and a successful evacuation of the party of two made through the sump into Bridge Cave. Neither of the two were divers but they had a quick 'crash course'. If entry conditions to the cave were not to be altered, clearly, something needed to be done, but more on this later.

A rescue practice was held from Waterfall series OFD1 and I think a lot was learned by all about Rescue techniques and by some about OFD1! There would have been at least one more actual practice had there not been so many callouts after this.

The Mountaineering First Aid Course was run yet again and was very successful. In the past it has been run for two years with one year off. In the future we intend to run it every year to make the numbers more even. I am pleased to report that Bob Hall has successfully completed a course giving him the status of 'Instructor'. This will be most valuable to us.

A second First Aid course was run in March to give the opportunity to people who are unable to or do not wish to attend the long course to be updated or trained in Cave Rescue First Aid Technique. Twenty five people attended and their interest was intense throughout the day - so much so that by popular request, a follow up is to be held soon to cover topics which were not covered on the day due to lack of time. Watch the notice board and Newsheet for further details.

The Dan yr Ogof Rescue Dump has been removed, destroyed and replaced. The telephone line has at last been repaired through the show cave - no easy task as there are several different types of wire all set in concrete and the stipulation that any new wire routed must be similarly set.

The final figures for the Raffle reached £970 gross; £850 nett after paying for the printing of the tickets and the prizes. Most of this money remains to be spent. Purchases this year - I have replaced the red hauling ropes and have bought a set of neoprene splints - these were demonstrated in the March First Aid Course and are very versatile - I heard of them through the Wharfedale CRO team who have found them very effective. Rescue. The money for these items (£200) has been recovered from a grant from the Welsh Office through the Mountain Rescue Organisation.

The wheels of democracy turn slowly indeed. I have spent a considerable amount of time trying to sort out the licence for our CRO radios and also the registration of the Landrover as an ambulance. The latter, I am pleased to report, has been successful. I hope the licence for the radios will be received in the not too distant future.

In February we held a meeting of the Wardens for West Brecon team. Some wardens have dropped out to be replaced with others (listed in the Call Out book). Two important decisions were made at that meeting:

1. Rescue practices should be held every three months. Each one will be organised by two of the wardens in turn. It is hoped that using this method the content of each practice will be of a high standard - calling in outside expertise if the wardens so wish. This should make these practices interesting and informative. Please respond by giving them the support they need and deserve.

2. Little Neath River Cave. We decided that in future we would like to have a telephone line from Bridge Cave main chamber to Mud Hall LNRC with emergency supplies in place in LNRC. In the event of a party becoming trapped by flood, we feel that they should have to 'sit it out' until the floods subside. We should only need to keep in communication with them and send divers in only if the circumstances make it absolutely necessary.

This decision was backed by the SWCRO AGM and also by the Cambrian Caving Council AGM. The suggestion from Cwmbran Caving Club to open up a dry entrance has now been withdrawn.

The Call Out lists have been revised and updated. In addition to the lists by areas we now have a list of about 30 people who are able to get to the club within about 1 hour, all of whom are experienced in the Swansea Valley Caves. Would these 30 people please make a special effort to attend the rescue practices and first aid course.

With the exception of the news of Bob's Instructor's Certificate, I have avoided mentioning people by name. I have received a lot of help from many people. I am confident that this help will continue. I thank you all.

Bob Radcliffe
Hon. Rescue Officer 1985 - 6

RECORD OFFICER'S REPORT 1985 - 6

The Club now receives 37 current journals and newsletters and in addition holds about 100 other titles which have either been discontinued or are published irregularly. The number of accessioned books has risen to more than 800, over 200 of these in the last 12 months. In the past year 146 items have been borrowed by 32 different Club members. Requests for assistance for finding information have been received from 6 individuals and in addition 3 requests from abroad for photocopies have been satisfied.

To encourage greater use of the library, recent additions to the library are now publicised in the Club's Newssheet and new issues of periodicals, previously kept in the filing cabinet to await binding, are now kept on the reference shelves for consultation. The Club's set of Current Titles in Speleology is now complete: these act as an index to most other periodicals that we take and many others besides. A subject index to SWCC Newsletters 1 - 100 is in preparation and nearing completion. The process of assimilating the Gordon Warwick collection in the library is continuing. Most of the books and periodicals in the English language are now available on the shelves. In the long term it is hoped to produce a complete catalogue of all the books, periodicals, audio tapes, slides and photographs in the library, as well as all the material comprising the Club's records.

We have received a donation of some 100 books, mainly on mining, from Club Member Lionel Dingle and these have all been accessioned and placed on the library shelves. The Club still lacks a number of important publications: it is hoped to produce a list of missing items required to complete our collections.

FIXED AIDS OFFICER'S REPORT

Over the past year a major reconstruction on Tunnel Top Entrance has been brought to near conclusion with all the concreting having been carried out and needing only a new gate to be fitted and the site to be landscaped.

Major clearance of the Cwm Dwr Entrance took place, making the entrance less susceptible to being blocked by boulders falling from the face above. There is still perhaps one good week-end's work left to finish this project off. This may be best done at the time of fitting the new gate.

Most of the fixed aids that the club maintains have been periodically examined with some notable exceptions, i.e. the fixed aids in Dan-yr-Ogof where there is also an outstanding project to refit the ladder in Gerald Platten Hall.

I mentioned earlier new gates - five new gates, all of the same pattern and completely interchangeable, are under construction. This will enable all cave entrances maintained by the club to be regated.

I would like to thank everybody who assisted me in the past year.

P. W. Cardy

EDITOR'S REPORT

Many thanks to Annie Peskett for all her work producing the News Sheet, a major task which often goes unnoticed except when the News Sheet is late! Both Newsletter and News sheet require YOU to contribute. The Hon. Editor's connection with the Welsh mafia (the Taffia?) have encouraged a new burst of literary effort by members this year. We still need more articles, photographs, etc., so get writing before "the boys" pay you a visit. Many thanks to all those who have done their duty and produced write-ups. Many thanks too to the staff of Landset who now print the Newsletter. The new format and presentation will no doubt be debated at the AGM where I will be standing as Editor again. I hope that by being Editor for another year I will be able to establish the club's publishing on a more consistent and firm footing.

Gary Jones

CONSERVATION OFFICER'S REPORT 1985 - 6

Members have explored with gusto, expanding the bounds of OFD especially while demonstrating a laudable care for the newly found areas and formations.

And thanks to those of you who have re-taped areas needing protection in the more used and well known parts of the cave. There's plenty of tape available for repair-work for those of you who have the inclination, ability and time (not the pretty, wide road-stripes, but discreet orange, you'll be pleased to hear!).

Thanks too to those of you who have scratched holes on the mountain and protected these holes from accidental in-fill by falling animal or human bodies. Members of the walking public locally have noted the care taken and commented favourably on it.

But these same people do level a criticism we should note. We pride ourselves in not littering our caves but have left some pretty monumental pieces of litter by digs (scaffolding, winches, etc.). Perhaps we could bear this in mind when tempted to leave material to come back to in the push the next year, or the year after, or after that, or . . . or . . . Rusting metal is hardly a natural beauty!

Let us not be complacent, but maintain conservation efforts above and below the ground we love and must cherish.

E. Little

