

JOURNAL OF THE

GREAT ORME



EXPLORATION SOCIETY

Issue No. 2, 1997

£2.50 to Non-members

FRONT COVER

Beer mat advertising the tram.

EDITORIAL

Welcome again to the GOES journal. Winter is on its way, which means the annual christmas dinner is just around the corner. This year Mark Beardsall has kindly taken on the responsibility of organising the whole event. The meal will take place in the Kings Head pub, Llandudno (by the tram station) on Friday 28th November, with food being served at 8.00pm. The cost is £13.00 per head. I have enclosed a copy of the menu and a booking form which needs to be completed and returned to Mark by November 14th at the latest, along with a deposit of £5.00 per head.

The summer walks proved to be very popular again this year. Some very interesting locations were visited and some interesting comments made... on a walk to Bryn Euryn it was noticed that there were several stone markers located about the hillside, each bearing a number. At one stage there were 5 GOES members very unsure as to where they were going until Tony spotted another stone marker in the distance. Helen rushed over to it and then called back to Tony to inform him "it's a tree!". Tony then eagerly conveyed the message to the rest of the group "we've found number 3!" We did eventually find our way off the hillside and back to the Kings Head.

Ty Gwyn access is due to change in the near future! As a result of the new tram system to be installed along the promenade, the entrance to the Ty Gwyn is to be moved to make way for a new road and a roundabout. The committee is doing everything to ensure that access to the mine by GOES members can be maintained.

NAMHO have brought out a new members book which details caving clubs from all over the country. GOES have got a page of their own, complete with a photograph of some of the Ogof Tudno diggers taken by Mark Beardsall back in the summer of 1996.

GOES are now on the World Wide Web all thanks to Tony Davies. He spent many long evenings coming to grips with the relevant jargon, and created his own Web page called Tony and Ali's Web Pages. This home page gives a brief description of where Tony and Ali live. There are links to the Great Orme Exploration Society, where you can find information about the Society and read extracts from previous journals, and also links to articles about Llandudno and the Orme in general. If you get the chance to go surfing Tony would love to receive an e-mail from you, especially if you have any great ideas to improve the site.

<http://freespace.virgin.net/tony.davies/Home.html>
e-mail: tony.davies@virgin.net

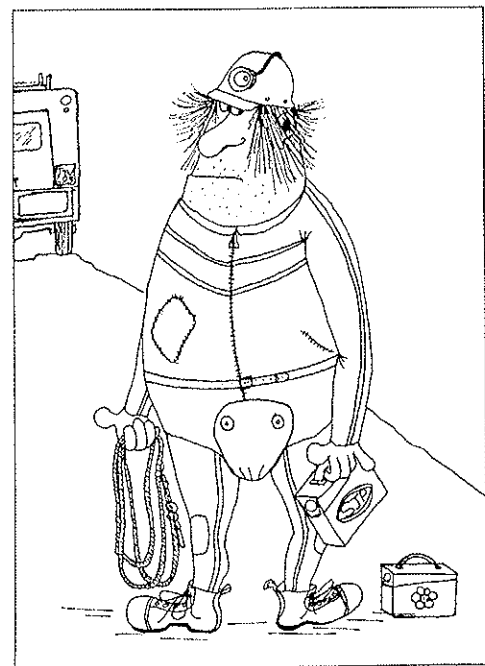
Alison Walton, Llandudno, October 1997

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CAVECARD No: 1.

© BIVOUAC - HARRIS 1996



LOOK MUMMY, A?

©

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THE STRUGGLES OF A SECRETARY

Many of you will be wondering as to just what is happening about the club organisation, after the rather drastic last Newsletter and the vote enclosed with it. This is an attempt to summarise what has happened over the past few months and what we will attempt to do.

Events started with a visit by Nigel (Chairman) and Steve (Treasurer) to a solicitor who had offered to do any legal work we may require for us. At the end of the discussion, they were then strongly advised for about an hour on the dangers of being a member of an unincorporated society such as ours. The main danger, according to him, was that if anything went wrong, the person with the most wealth/goods could be sued, i.e. people could lose their houses over something with which they had no direct involvement. This stern warning coincided with the week that the alpine guide was sued by the children of the fellow climber who died. It also was followed by the annual NAMHO conference, to which Nigel had gone as one of the visiting speakers and to represent our Society.

Another of the speakers was a Chief Inspector of H.M. Mining Inspectorate. He warned that all societies were in danger because of inadequate training and procedures and that in the event of an accident, members of those societies would not just be sued by a solicitor representing the family of those injured but by a barrister representing the Health and Safety Inspectorate with their limitless resources. Nigel spoke to him personally for an hour afterwards and returning thoroughly petrified by all this, Nigel called a committee meeting, but failed to get an assurance from members that they would suspend all non-essential activities until we had restructured the society so that all committee and other members were fully protected.

At this time I was finalising my ordinary occasional Newsletter. So I was asked to tag on to it a brief note of our problem and a voting slip to sound out members as to whether we should make enquiries about becoming an Association Limited by Guarantee. Bear in mind that some members felt it was all a lot of fuss over something which might never happen (and lets hope nothing ever does) and we should just carry on as usual, relying on our normal insurance. Believe it or not my newsletters often do have a deadline for going out and this was about the day before. The day I was due to print & post, I got the letter of resignation from Nigel and Diane. This is the reason why such an important event was tagged on almost as a footnote and I know this was remarked upon. I should like to pay tribute here to the amount of work put in on behalf of the Society by Nigel, the huge improvement in profile and status for us that he achieved, and the progress in research accomplished. We have had confirmation from Nigel that although he has resigned, he supports GOES at all times. The committee have written to ask him and Diane to consider resigning temporarily while the organisational structure is resolved.

I also considered resigning, after all why should I put my house at risk on behalf of other people's recreation? However, I think that the mathematical probabilities of such an event coming about in the time that we take to resolve matters are very, very remote.

The vote was designed to cope with members natural inertia, that is why any non-votes were regarded as "Yes", as the Committee generally felt that we should make further enquiries, and this is why there was a deadline for votes. Out of a membership of 86 we had 6 Yes and 4 No votes, two phone calls asking for clarification and one member resigned (aside from Nigel and Di) stating he didn't have the time to actively participate in the society.

Having got a go-ahead, we started making enquiries. We have an insurance policy via BCRA (British Cave Rescue Association) which is mainly designed to cover us on third party claims and I telephoned Brian of BCRA who administers this for lots of caving and mine exploration clubs. He said his club had gone through a similar 'crisis' about 10 years ago, but had decided that the insurance was so comprehensive they were fully covered. He added that in all the years he'd been involved and all the clubs he had contact with, no member had ever been personally sued. I also phoned my accountant to find out the cost of forming a Company Limited by Guarantee. This is where individuals can only be pursued to the limit of their investment (say £10). He told me it would cost about £170 to form one and take about three weeks, we'd have to submit audited accounts to Companies House annually (which I was later told cost about £17). However he also suggested we write to our insurers to ask them to confirm we were covered for every eventuality, it would be unlikely that they'd commit themselves, but if they did it would save us a lot of trouble and £170+. I have done this and as a matter of courtesy wrote via BCRA, I then got a very long letter back from Brian, basically saying that although he wasn't expertly qualified legally or in insurance, he thought we were OK. So I then had to write back saying we specifically wanted an expert opinion and ask him again to forward our letter to the insurers and we are awaiting a reply.

The other avenue we have taken is via NAMHO, the National Association of Mining History Organisations. We pay them an annual subscription and as they are our governing body issuing guidelines, we asked them to get proper legal advice on our behalf, and after the conference what were they doing about the warning they'd been given? Well I wrote twice, and after a few weeks phoned their secretary, who hadn't had my letters forwarded to him. He said over the phone that he thought it made sense for us to become a company as it was easier to negotiate with local councils as a legal entity (which we are not now). Peak District Mining Society Ltd. have been a company for about 20 years as they run a substantial mining museum and handle a lot of money and had to become this to work with their local council.

The latest news is that NAMHO at their next meeting will be having discussions with the H. M. Mining Inspector. I have been invited but cannot go as I am away on October 25th, I think we will be represented to put our views and requirements, but a discussion is one thing, putting the facts in writing is another. I am sure that even becoming a Company Limited by Guarantee will not absolve us from all responsibility. The Health and Safety Executive could still turn around after an accident and ask questions of the Directors about training and/or lack of it, who is the nominated Safety Officer, how many courses has he/she been on, why wasn't he/she on site and so on and so on. So we must keep abreast of developments and be involved with the formation and implementation of safety codes. The days of being an informal band of moles are over, the reality is that our hobby is perceived by others as dangerous and to get permissions and insurance one has to comply with their rules. My own view is to let inactive members like myself put up with all the paperwork and let the active workers get on with the exploring.

Dave Edwards, Llandudno, October 1997

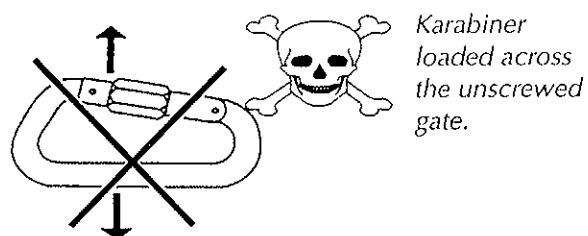
Both Petzl Stops and racks are devices which need some training in their use if they are to be used safely and to the best of their capabilities. You need to practice on the surface where you can see what's happening and can get down safely if it all goes pear shaped! The 'training' may be from another member of the society, who has been doing it for years and he'll show you how.... but does he really know what he is doing, or has he been using unsafe practices for years and just been lucky to get away with it? If you rely on a club mate to show you how, be sure that he has sufficient experience to understand not only how the device works, but also what can go wrong if it is accidentally misused. Alternatively, you could decide your life is worth a little money and attend one of the SRT (Single Rope Techniques) beginners' workshops now widely available. Safeguarding an abseiler underground is not always easy. Top-roping is seldom practicable due to constrictions at the pitch head. It is really only feasible for short and simple pitches with no obstructions or re-belays. Using a shunt is really for the expert and hence isn't the answer for a novice caver. The safest system is a "bottom belay" where a caver stands at the foot of the pitch ready to pull the rope tight if the abseiler starts to descend too fast. However, the belayer is in a vulnerable position at the foot of the pitch and, again, it only works on a single pitch with no rebelays (*suitable for all the shafts on the Orme*). It is a technique worth knowing but needs some practice on the surface to be sure you can use it effectively.

Harness attachments:

The most common approach to SRT is for a caver to 'kit up' and keep the harness on whilst caving, detaching only descender and foot-loops whilst travelling between pitches; the harness can then be taken off for crawls or if there are no more pitches to negotiate. There are only two devices that can be used to attach descenders safely:

Maillon or Screw-gate Karabiner. Which you prefer is a personal choice but there are some points to be aware of:

- When descending a constricted pitch the connecting device between harness and descender may be subject to jerks and banging on rocks or it may be twisted, squeezed and dragged between body and rock.
- A karabiner is relatively easy to put on and take off BUT if it is loaded across the gate its strength drops dramatically.
- It has been shown that if a karabiner is tapped sharply on the 'spine' (by striking a rock for instance) the gate momentarily flips open.



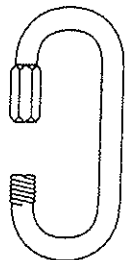
In order to overcome these problems a screw-gate Karabiner is used but it is possible for the sleeve to become unscrewed by being caught or dragged on clothing or muddy rocks and, once it is unscrewed, the Karabiner effectively behaves as a snap-gate karabiner.

- Provided the sleeve of a maillon is screwed up, a load can be applied in any direction without a reduction in strength.
- It has been shown that, if a small diameter maillon is used to attach a Stop to the harness, it is possible for it to pass through the 'gate-latch', so opening the swinging side of the Stop - though this has never, so far as is known, actually happened in use.
- A maillon is slightly more 'fiddly' than a karabiner to put on and take off because the screw sleeve tends to be stiffer to operate.

You choice?:

Maillon:

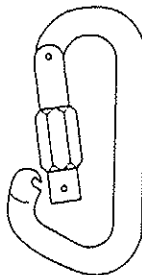
It should be a minimum diameter of 10mm. Probably the most suitable is an alloy 10mm long-series oval.



Karabiner:

Screw-gate 'D'.

Make sure the gate opening is pointing downwards so that, if the sleeve is loosened, it will tend to screw itself shut.

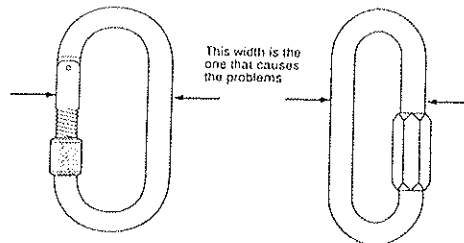


Whichever you decide to use, if you leave the descender attached to the harness, always check the security of your system before you descend a pitch.

Petzl Stop Descender - a Warning!

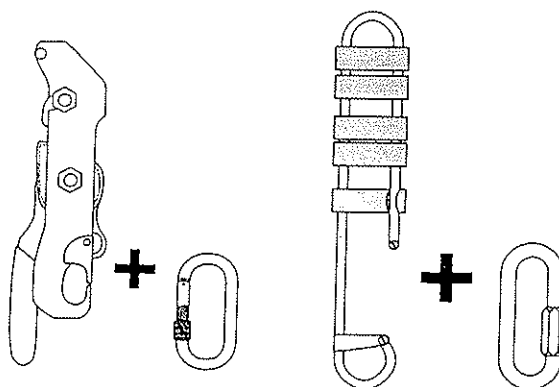
Lyon Equipment Ltd., the UK distributors of Petzl equipment, have advised that it is unsafe to use any Maillon Rapide to connect a Petzl Stop descender to a harness. The problem with the small diameter Maillons has been known for some time but Lyon Equipment

Lyon Equipments' Development Engineer, Chris Ware, confirms that a 10mm long-opening Maillon Rapide is perfectly acceptable for attaching a Rack but should NEVER be used to connect a Petzl Stop Descender. He suggests that the ideal connector for any descender is a large karabiner with a double action locking gate, such as a Charlet Moser bayonet lock or DMM Locksafe. Either way, with a gate that requires two separate actions to open it, you are very unlikely to open it in use.



Direct attachment of a Stop into the semi-circular Maillon is not advisable because it leaves the descender in the wrong orientation, and also means the Stop is difficult to remove in an emergency situation.

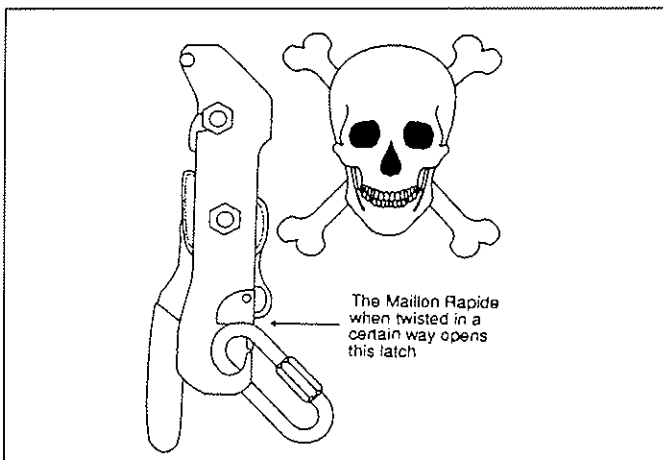
Either of these two systems is safe:



Stop + Oval Screwgate Karabiner

Rack + 10mm long-series Oval Maillon

Taken from the National Caving Association Training Bulletin No. 96/4 - July/August.

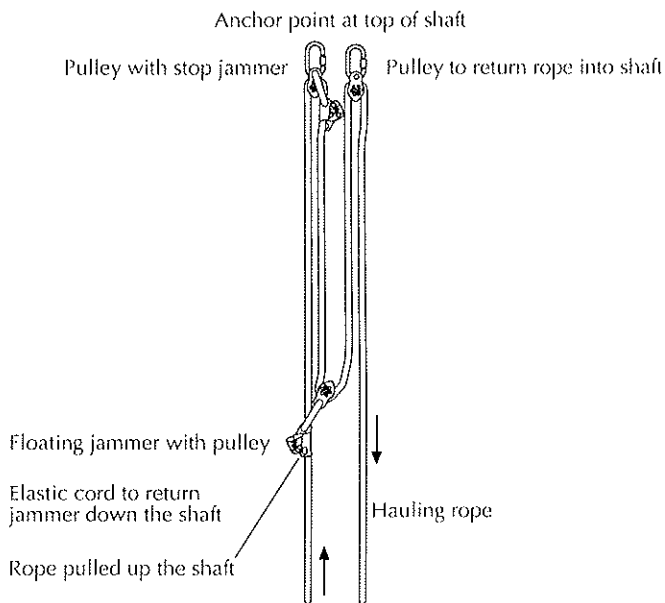


advise that this applies to the 10mm model also. The reason why the 10mm Maillon is not suitable is nothing to do with the bar diameter, it is the relatively narrow width across the Maillon that makes it ideal as a lever to open the latch on the Stop when twisted at the right angle.

RESCUE PULLEY SYSTEM FOR SHAFTS

The equipment required to setup this pulley system:

- 2 Jammers
- Three Pulleys
- Karabiners as necessary



The system consists of a floating jammer which forms a 2:1 pulley to the shaft length locked off at the top with a second jammer. The system is enhanced by adding a length of elastic cord to return the floating jammer down the shaft on completion of each haul. In practice sessions it has been possible for one person to pull another but working with two people will reduce the effort required.

The society has dedicated rescue equipment in the club store which includes all the items for the above rig.

NOTE: FOR THE PURPOSE OF CLARITY NO SAFETY LINE HAS BEEN SHOWN - THIS MUST BE USED WITH THIS METHOD AT ALL TIMES

Stephen J Lea, *Glan Conwy*, September 1997

TRUE STORY!

Three men in a rural area were wending their way home one fine summers evening, somewhat the worse for wear. In the gathering dusk one of them spotted an open mine shaft, by the side of the cart track along which they were 'walking', and they decided to investigate the shaft.

Having dropped some pebbles into the abyss, one of them spotted a railway sleeper a few yards away from the shaft top. Working together, the three chums picked up the sleeper and tossed it down the shaft.

What was so startling about the plummeting baulk of timber was not so much the attached steel chain which snaked past them, but the sudden appearance and disappearance of the unfortunate goat which was tethered to the chain!

An article by DDMS, taken from the NAMHO newsletter, Winter 1996.

COTONEASTER

Cotoneaster 'Cornubia' (Rosaceae)

Parent species native to northern India and China; *C. "Cornubia"* is a hybrid. From August to spring provides red berries for birds including mistle thrushes and blackbirds. Waxwing from Scandinavia among the rarer birds. Most other cotoneasters are also hospitable.

There is one native species of *Cotoneaster* found on the Great Orme in North Wales. This is the wild cotoneaster, *C. integerrimus* and there are very few plants left. Nearly 50 exotic species of *Cotoneaster* have escaped from British gardens into the wild (several on the Great Orme with our native species) and provide nectar for bees, wasps and other insects.

There are several micro-moths whose larvae eat cotoneaster (and often other Rosaceus plants). These include the hawthorn moth *Scythropia crataegella*; the marbled tooth roller *Ancylis achatana*; the common fruit-tree pigmy *Stigmella oxyacanthella* (recorded from *Cotoneaster frigida*); the cotoneaster webworm *Athrips rancidella*; the common blackthorn groundling *Teleiodes vulgella* and the wainscot smudge *Ypsolopha scabrella*.

Taken from the Internet, Nov 1996.

ACCIDENT REPORT

This is a mine explorers accident report that was submitted to the Compensation Board:

Dear Sir,

I am writing in response to your request for additional information in block 3 of the accident form. I put "poor planning" as the cause of my accident. You asked for a fuller explanation and I trust the following details will be sufficient.

My hobby is the exploration of old abandoned mines. On the day of the accident, I had arrived early at a mine shaft with a friend, we decided to speed things up by getting the tackle bags to the bottom of the shaft before the others started to arrive. (These bags were later weighed and found to be 110 Kg). To achieve this I decided to use two ropes, one belayed securely for me to abseil to the bottom on, and one through a pulley to lower the bags on.

I abseiled down the shaft and when at the bottom unclipped myself from the rope. Then holding the end of the rope which went through the pulley I shouted up to my friend to swing the bags over the shaft for me to lower them. I held the rope tightly to ensure a slow descent of the 110 Kg of tackle bags. You will note on the accident reporting form that my weight is 70 Kg.

Due to my surprise at being jerked off the ground so suddenly, I lost my presence of mind and forgot to let go of the rope. Needless to say, I proceeded at a rapid rate up the shaft.

At approximately half way, I met the tackle bags which were proceeding downward at an equally impressive speed. This explains the fractured skull, minor abrasions and the broken collar bone, as listed in section 3, accident reporting form.

Slowed only slightly, I continued my rapid ascent, not stopping until the fingers of my right hand were two knuckles deep into the pulley which I mentioned in paragraph 2 of this correspondence. Fortunately by this time I had regained my presence of mind and was able to hold tightly to the rope, in spite of the excruciating pain I was now beginning to experience.

At approximately the same time, however, the tackle bags hit the ground and one of them split open on impact dumping its contents. Now devoid of the contents of this bag, there was only a weight of approximately 20 Kg on the end of the rope.

I refer you again to my weight. As you might imagine, I began a rapid descent down the shaft. At approximately half way, I met the remaining intact bag coming up. This accounts for the two fractured ankles, broken tooth and severe lacerations to my legs and lower body.

Here my luck began to change slightly. The encounter with the bag seemed to slow me enough to lessen my injuries when I fell into the pile of ammo boxes and assorted paraphernalia. Fortunately only three vertebrae were cracked.

I am sorry to report, however, as I lay there on the pile of ammo boxes in pain, unable to move and watching the remaining bag swinging in the light at the top of the shaft, I again lost my composure and presence of mind and let go of the rope!

Tony Davies, Llandudno, October 1997

REFLECTIONS IN A CHURCHYARD

St. Tudno's Church, on the Great Orme at Llandudno is said to date back to the sixth century. In January 1839 the roof was destroyed during an exceptionally severe storm and it was decided to build a new church in the town. The old structure remained roofless and weather battered for fifteen years. It could well have ended in a state of total dereliction but for the intervention of one man. In gratitude for his daughter's recovery from a serious illness, Mr. W.H. Reece of Plas Tudno financed the restoration of the old building. On 18th October 1855 the church was re-opened and regular, though infrequent services, have been held there ever since.

Great changes had taken place in Llandudno between the destruction of the roof and the re-opening. Many of the grave memorials reflect this progression.

Near the wall on the southern side are many simple slate markers. A simple Welsh inscription on one records the death of Edward Roberts in the year 1856. Although twenty seven years old he is identified as the son of William Roberts, blacksmith of the Old Mine. Surely the sign of a small close knit community.

An impressive memorial in the form of a broken pillar records, in 1851, the death of an eighteen year old youth, Alexander Fred Leisler. He died as the result of a fall on the Little Orme. He had gone there by boat to shoot, 'rock birds', and in trying to recover one, had fallen to his death. Apparently the shooting of sea birds was a common practice amongst the earlier visitors.

Alongside this spot is one of Llandudno's best known graves, that of Leonard Bright, the infant son of John Bright, M.P. On their first visit to the town the family walked through the cemetery and the five year old child expressed a wish to be buried there. Within a week he had died of scarlet fever. His innocent childish wish had been granted. In regularly visiting the grave John Bright formed his long association with Llandudno. The townspeople tended the grave and placed flowers on it for many years. Even today fresh flowers are sometimes to be seen there.

An ornately carved slate tombstone marks the resting place of Owen Williams, aged forty. He died from injuries received whilst working in the Happy Valley Quarries in 1877. Ten years later the quarry was closed and the site presented to the town as a recreation area to commemorate the golden jubilee of Queen Victoria's reign.

In 1888 Dr. Thomas Charles Roden, M.D. died. His resting place was marked with a marble cross on the back of which a copper lightning conductor had been fixed. Ironically in 1978 this was one of the many gravestones overthrown by a man deranged by drugs who caused considerable damage in the churchyard. The good doctor, who seemed to have considered most eventualities, could hardly have built in any safeguards against such an event.

Many graves reflect the ever constant presence of the sea and its influence on the community. In 1894 Hugh Jones died aged seventy. A former copper miner he became the coxswain of Llandudno's first lifeboat, "The Sisters' Memorial". he commanded her from her launch in 1861 until he eventually retired in January 1875. Surprisingly this fact is not mentioned on his tombstone. There is however an englyn;

*Mi hwyliais y mor heli – ond mynwent
Yw'r man gwnes angori;
Llon bŵm llais uwchben y lli,
Ond tawd yma yn tewi.*

Invariably, the rhyme and much of the impact is lost in translation,

*I sailed the salt seas, - but a cemetery
Is my anchoring place;
My voice was happy above the waves,
But here it is silent.*

Near the southern gate is a huge monument in brown marble. This impressive tomb marks the last resting place of Thomas Tudno Jones, Priest, Poet and Writer who died in 1895 aged 51. Tudno, as he was known, was born into the old Llandudno of 1844, the small copper mining village near Conwy. He lived through its transition into one of Britain's leading holiday resorts. He became the first editor of the Llandudno Directory. In 1883, having abandoned journalism, he was ordained as an Anglican priest and served in Liverpool, Llanblodwel and Llanrwst. and was a fierce campaigner against the disestablishment of the Anglican Church in Wales.

His memorial contrasts hugely with the simple slate marker of Edward Roberts. Both were born into the same small close knit community. Tudno was ten years old when Edward Roberts died. Although starting from the same place they walked very different paths. A wind of change had started to blow.

The inscription on Tudno's marble tomb is being slowly eroded by the weather and is becoming more difficult to discern. The lettering on Edward Robert's slate marker is as clear as the day it was cut.

There are over eight hundred grave memorials in the old churchyard at St. Tudno's. How many stories could they tell?

Tom Parry, Llandudno, December 1996.

GOESMOLES GET DRESSED

The majority of the members of GOES - the aged, the infirm, the claustrophobic, or the just plain idle - have little or no idea of what happens underground. To the likes of us, "underground" is a dark and mysterious world, inhabited by knockers and crazy people, who like to do impossible things on ropes. Even the language of these foolhardy few is alien, with expressions like "SRT", "rope walking", "rock bolts" and "belays". Some of us even wonder if the whole thing is a fabrication, and the only "underground" is a place where trains dash around to Moorpark on the Metropolitan line and Chancery Lane on the Central. Unfortunately, unless Tony Davies favours us with another of his enlightening speleological videos, we will never learn any more about the wonders of the nether world.



However, there is a pre-underground ceremony, which few have witnessed. To do so only involves a car ride up the Orme to where the road reaches base camp, (not the underground one!) before the uphill slog to the old mine shafts. It is not even necessary to leave the comfort of your vehicle in order to watch these goings on, which are full of human interest and humour. Shortly after ten o'clock on most Sunday mornings, drive half way up the Orme, and look out for the strange assortment of landrovers, vans and old jalopies, loosely parked by the old waterboard buildings. Here you will see several of the species, "undergrounders", hereinafter known as "goesmoles". If you are lucky they will already be involved in a strange, inelegant, reverse striptease.

On one typical Sunday in August, I arrived at the viewing place to discover that four goesmoles were well underway in the ritual of the dress. Already they were clad in their "blues", the state of which ranged from pristine new to just plain gungey. A conglomeration of strange, colourful straps, chains and other metal bits, littered the ground. The use of these was only known to the wearers, and maybe not always to them! The goesmoles were in the process of struggling into some fiendish looking contraptions, much like mediaeval instruments of torture, which were worn like underpants. These, apparently, are known as harnesses, and are not unlike the equestrian variety. One goesmole, wearing a new pair of overalls in a beautiful shade of cerulean blue, was "test flying" an experimental new harness. The process of climbing into this appeared to be giving him some stress. After battling for a while, his anguished cry could be heard, "I've got a strap too many. What do I do with it?" A female goesmole, who had probably experienced something similar with difficult bra fastenings, reassured him. "It's O.K, that's a pocket in your overalls."

Another goesmole was encountering problems with a peculiar strap thing, an accoutrement of rope walking, so I was told. It would seem that it was necessary to attach the aforementioned object around his boots, thus giving him purchase when negotiating the rope walks - whatever they may be. "It's a new type", the goesmole said, peering at the said object, whilst probably deciding which way up it should be worn.

At this point, I decided to leave the scene. It was time for coffee and, besides, if I had tarried longer I would probably have ended up giggling, which might not have been very tactful.

Eve Parry, Great Orme, 1997

Hidden GEMS: Azerbaijan!

As GOES members usually limit their exploration to the Orme, this article takes you somewhat further afield - to the shores of the Caspian Sea. Last year I went out to work in Azerbaijan and I should like to share a little of my experience of this strange country with you.

'Where on earth is Azerbaijan?' I hear you ask, that was also my first reaction. I vaguely remembered hearing about Azerbaijan as a child and thought a country with a name as exotic as that must surely be at the end of the earth. Well it is not quite that far away and last October I found myself at Gatwick airport taking a newly reinstated BA flight to Baku, the capital city of the Republic of Azerbaijan. Before I left Britain I did a little research to find out what I could about the country, as the old saying goes, 'forewarned is forearmed'. However, that proved difficult in itself. You don't find trips to Baku as tourist package deals, and the enquiries clerk at BA kindly informed me that he thought services to Baku had been suspended a couple of years ago due to civil unrest in the region! This did nothing to calm my nerves and I began to wonder why I had agreed to spend two weeks on an oil field site all for the sake of the profits of my company. I tried various book shops including Stanford's in central London (the place to go if you want maps of almost anywhere, especially if you are planning an expedition) all to little avail. Anything written about the country was several years out of date and in a region of political unrest three years can make a huge difference. In the end I wrote to the Azerbaijan embassy in London and started searching the Internet for information. This worked and before I arrived in Baku I knew the following few facts:

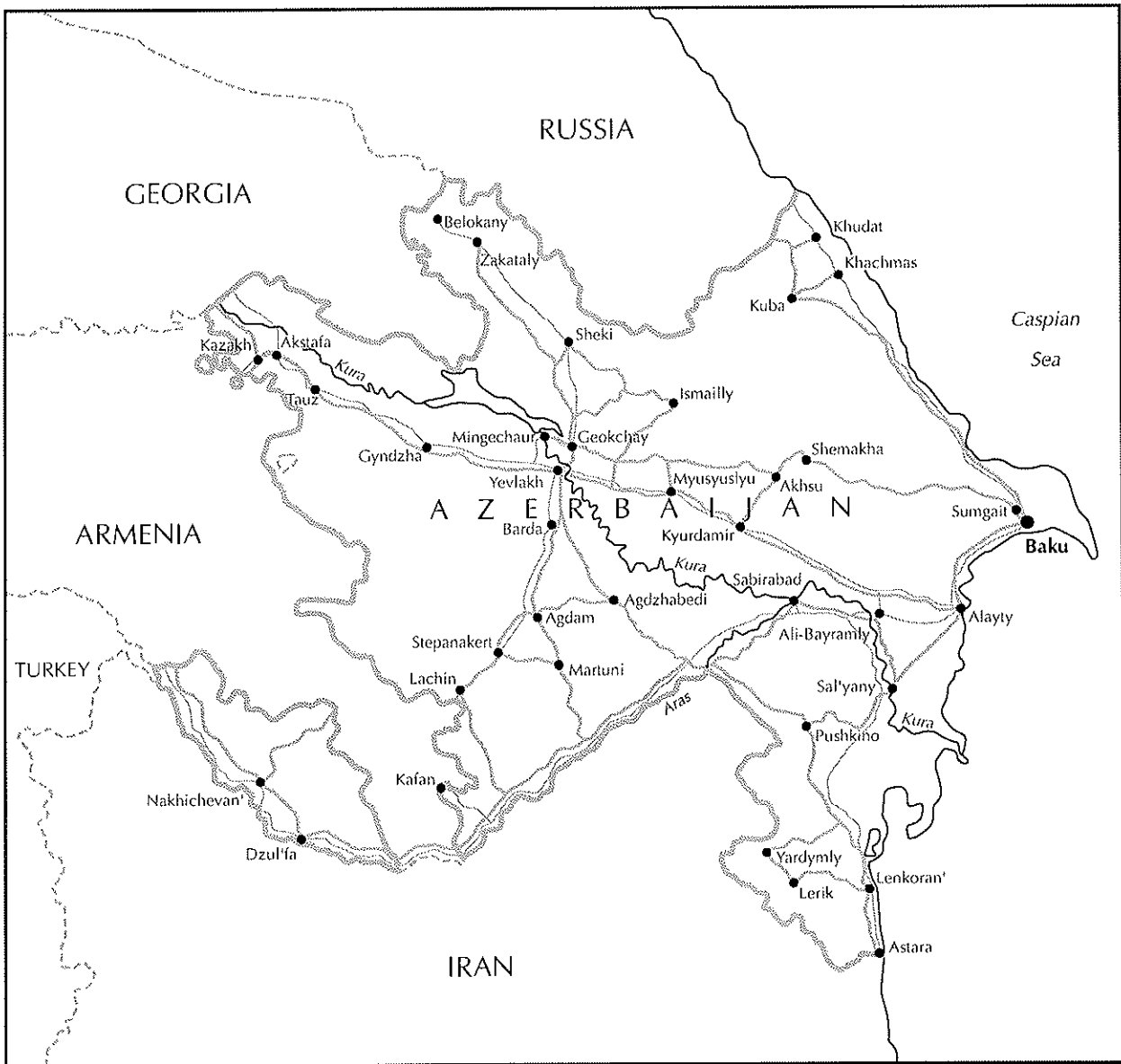
location: south western Asia, bordering Russia and Iran, Caucas mountains to the north [see map]
population: 7.5 million
religion: greater than 90% Muslim
political stability: five presidents in the last six years, two coup attempts since 1993.
currency: the Manat (approx 4000 Manat to 1 US \$)
language: 90% Azeri, 3% Russian
climate: generally dry and semi arid, but seven distinct climate states in this small country.

The flight from London to Baku takes about five hours and whisks you away from an affluent, capitalist western society into the poverty of a collapsed soviet regime with a middle eastern flavour. The flight path takes you over the magnificent Caucas mountains, which at the time of my visit were home to the Chechen rebels. The Republic of Azerbaijan gained its independence from the Soviet Union in 1991 and ever since has been struggling with its identity. In Baku there is an odd mixture of pre-Soviet Persian culture, Soviet imposed ideals and post-Soviet capitalism.

For example, you can buy traditional Persian carpets in dusty, dimly-lit stone houses in the Old City. It is however, illegal to take antique carpets out of the country. Most people are able to speak Russian and statues of Soviet heroes still grace public squares and the once magnificent art galleries, museums and libraries. Today the roads are all potholed, the street lighting no longer works, the water supply is dubious, Russian style trolley buses still run but have their electric cables trailing down into the streets, nine out of every ten cars are Ladas (usually with a smashed windscreens, no lights or indicators). Benetton has opened a new shop in the main street, foreign business men flood the city with dollars and new supermarkets have recently opened filled with goods too expensive for many locals to buy. On street corners people sell figs, pomegranates, bread, fish, meat and hens, trying to make enough money to survive, old ladies, the disabled and refugees from Armenia have to beg for money to buy food. Azerbaijan has the highest ratio of refugees per capita in the world, approximately 1 million refugees in a total population of 7.5 million. Azerbaijan is locked in an eight year conflict with Armenian separatists who currently occupy 20% of Azerbaijan's territory. The war has resulted in considerable loss of life on both sides and Russia has mediated a cease fire since 1994.

Azerbaijan has three main exports: oil, caviar and carpets. From ancient times oil has been a source of great wealth in the country. Over 2600 years ago people knew the value of Baku's 'black gold'. And the city was an important centre for the Zoroastrian religion (fire worshipers). In the nineteenth century Baku became the oil capital of the world. The Nobel brothers from Germany played an important part in development of the Azeri oil industry. More recently oil has been the cause of conflict and pollution. Very little is known in the West today about the important contribution the small Soviet Republic of Azerbaijan made in helping defeat the Nazis during the Second World War. Hitler wanted to take Baku and so remove the Soviet oil supply. Without the commitment of the people of Azerbaijan and their efforts to continue oil production the war may well have had a very different outcome.





Baku is situated on the Aspheron peninsula which juts out into the Caspian. This area is now considered to be one of the most ecologically devastated in the world due to severe air, water and soil pollution, the majority of which has resulted from the oil industry. During the period of Soviet control there was little concern for the environment and this has left a legacy of environmental devastation rarely seen in the West today. The water lapping the sea wall along a once magnificent promenade is now covered with a film of black oil. The holiday resort of Baku would have rivalled that of Llandudno in its hey day when middle ranking Polit Bureau staff would flock to the shores of the Caspian for their annual vacation. Proven oil and gas reserves exist offshore in the Caspian Sea these reserves have attracted considerable interest from oil companies in the USA, UK, Scandinavia, Japan and Russia, all of which want a slice of the profits which could be made from this region. The government of Azerbaijan has recognised that the environmental pollution poses a threat to the health of the local population and a bar to acceptance by foreign investors. My company's job was to carry out an environmental audit of some of the old onshore oil fields as part of a study to encourage foreign investment in these fields. After what we wrote in our report I cannot imagine western companies would want to invest in the fields for fear of litigation.

I spent twelve days visiting various oil fields. The extent of the pollution was astounding. I won't bore you with details but suffice to say that every drainage ditch was filled with oil, rusty storage tanks leaked their contents on the surrounding ground creating areas of oil saturated soil devoid of any vegetation, raw sewage flowed through the sites mixing with the oil, the stench of hydrogen sulphide filled the air, industrial and domestic waste was dumped on the sites including rotting animal carcasses, whilst children played nearby and refugees picked through the debris looking for anything of possible value. Milton could have written scenes from Paradise Lost here and you could be forgiven for thinking that you had actually arrive in Hell on earth.

Despite the extent of the deprivation the local people were polite and friendly. I was offered a seat on an over crowded bus by several elderly men as women were not permitted to stand whilst men sat down ! We were invited for afternoon tea by the local police who were intrigued as to why we were wandering around an oil field one Sunday afternoon. Every where we went tea and biscuits were procured, the tea was strong and black, served in fluted glasses, sugar was eaten whilst drinking the tea rather than placed in the glass as we would do in the West. On reflection the biscuits must have been saved for special occasions and the our visit was deemed to be one. I think drinking the tea was probably the cause of stomach upsets by the end of the first week, which luckily a few doses of Immodium soon put to rights. Being ill in a country without public toilets is not something to be recommended! My colouring attracted some attention, Azeris are generally dark skinned with brown eyes and brown hair, anyone with blue eyes and fair or red hair stands out as a foreigner. On my one and only trip to the local market alone after buying a painting with dollars I attracted a follower.

For a few moments I was scared, here I was alone, in a strange country knowing only a few words of Russian and a man was following me. Was it because I had paid for the picture in dollars when you are supposed to use the local currency of Manat? Was it more sinister? And could I even remember the way back to where I was staying ? In the end it turned out to be quite funny. The man was little more than a teenager, he managed to tell me through sign language he was a member of the Azeri army, he thought I was a rich American and asked me to marry him! My limited knowledge of Russian came in useful at this point when I remembered the word for goodbye 'Dasvedanya' I said somewhat forcibly and we parted company, with me smiling to myself. Other scrapes were less humourous. Whilst walking through grass on one deserted oil field a large green snake darted out in front of me. I froze, shocked to see the reptile. No one had warned me that poisonous snakes inhabited the region. My companions and I later saw three snakes coiled around a derelict oil well. I later learnt that a there was a snake farm nearby where snakes were milked for their venom to make an antidote for their bite. If we had been bitten there would have been little we could have done to explain what type of snake had bitten us and in view of the scarcity of medical facilities we probably would not have survived the fifty mile journey back to Baku. On another occasion I was walking over what I thought was solid ground only to be shouted at in Russian by an old lady who was warning me to take care (stupid foreigners she must have thought). Beneath where I was standing was an underground oil storage tank. The roofs of many such storage tanks have recently collapsed leaving gaping holes into black oily pits some twenty feet deep. For once I was glad that this trip did not involve any underground exploration and subsequently took much greater care where put my feet.

As this trip was virtually all work I did not get chance to see much of the surrounding countryside which I was told is very beautiful and relatively unspoilt. I arrived back in Britain safe and sound, if somewhat changed by my experiences. In our country where we often have more than we need for a comfortable existence people are frequently unwilling to help those less fortunate than themselves. Whilst in Azerbaijan where the majority of people are living in poverty we were treated with hospitality we did not deserve, there is considerable respect for the elderly and in the young hope that the future will bring freedom for their people who have for so long been dominated by the influences of other countries. I hope, in ten years' time to be able to return to Baku, to see what changes have taken place and whether or not the injection of Western capital improves the lives of the local population.

Helen Jones, Llandudno, September 1997

CAVE SURVIVING - PART 3

Survey Plotting:

For a sketch of low accuracy (grade 3) of a small cave it is just about acceptable to draw the survey directly from the figures obtained in the cave using a ruler and protractor. This method is not recommended however, as it is very prone to cumulative errors (an error in marking one station will affect all the succeeding ones) and even with a survey where only medium accuracy is claimed, it is advisable to make some corrections to the instrument readings, with an accurate survey (grade 5 or 6) it is essential that station co-ordinates are directly plotted.

Calculating Survey Results:

The first step is to convert the compass bearings with respect to grid or true north by subtracting (in the UK) the compass calibration obtained at the start of the day's surveying. Similarly the clinometer readings should also be corrected for scale zero errors at this stage.

After correction, any backward readings will have to be converted to the equivalent forward reading, e.g. for compass +/- 180° whichever gives a reading between 0° and 360° and with clinometer readings it is only necessary to change the +/- sign (CLINOMETER READINGS MUST BE CORRECTED BEFORE THEY ARE CONVERTED)

It is then necessary to calculate the true horizontal distance by simple trigonometry using the following formulae:

HORIZONTAL DISTANCE $h = d \times \cos a$
 VERTICAL CHANGE $= d \times \sin a$
 Where 'd' is the measured slope distance, and 'a' is the corrected clinometer reading

If the survey is to be plotted by station co-ordinates it is necessary to calculate the change in direction eastward

and northwards (negative values being westward and southward) by the following formulae:

CHANGE EASTWARDS $= h \times \sin b$
 CHANGE NORTHWARDS $= h \times \cos b$
 Where 'h' is the horizontal distance already calculated and 'b' is the corrected compass reading

If a survey is made from one station to another and then back to the first, this is called a closed traverse. Any error made during the survey will mean that the co-ordinates calculated for the final station shall not be the same as those given at the start, this difference is called traverse misclosure.

It is usually quoted as a percentage of the traverse length. If surveying to grade 5 it can be expected to be in the order of 0.5 to 1.0% slightly larger on very short traverses. (see table below)

Plotting:

The size of the plan required will determine the scale to be used to plot the survey, however do not plot to non-standard scales, the best scales are 1/50, 1/100, 1/250, 1/500, 1/1250 and 1/2500. The use of graph paper is recommended for plotting station co-ordinates as the northings and eastings can be directly plotted and the size can be easily determined from the minimum and maximum readings.

Once the draft plan is completed it can be traced on tracing paper or better still drafting film in ink or pencil and additional information added as follows:

- North point clearly annotated Magnetic North with the date of the survey
- Title - including the location of the survey, name of surveyors, date carried out and date plan drawn
- Scale of plan

Compass calibration to Grid North - 08.5°			Clinometer calibration = 01.0°					Mine = Thatadit					Station Co-ordinated						
Readings		Clinometer							Compass					Station Co-ordinated					
From Sta. No.	To Sta. No.	Back Reading	Corrected Back Reading	Forward Reading	Corrected Forward Reading	Slope Distance	Change of Height	Horiz. Dist.	Back	Forward	Corrected Bearing	Change of Easting	Change of Northing	Station Number	East	North	Height		
10	11			+43.0	+44.0	7.07	+4.91	6.09		230.0	221.5	-3.37	-3.81	10	145.11	520.03	43.03		
11	12	-19.0	-18.0		+18.0	11.03	+3.41	10.49	155.0	335.0	326.5	-5.79	+8.75	11	141.74	516.22	47.94		
12	13			+21.0	+22.0	9.017	+3.44	8.50		307.5	299.0	-7.44	+4.12	12	135.95	524.97	51.35		
13	14			-25.0	+27.0	7.71	-3.50	6.87		063.5	055.0	+5.63	+3.94	13	128.51	529.09	54.79		
														14	134.14	533.03	51.29		
14	141			-90.0	-90.0	5.93	-5.93	0.00				0.00	0.00	141	134.14	533.03	45.36		
141	142	+01.5	+0.25		-0.26	4.60	-0.20	4.60	314.0	134.0	125.5	+3.74	-2.67	142	137.88	530.03	45.06		
142	143	+08.5	+0.95		-0.95	5.40	-0.89	5.33	336.0	156.0	147.5	+2.86	-4.49	143	140.74	525.87	44.27		
143	10			-10.0	-0.90	7.24	-1.13	7.15		148.5	140.0	+4.60	-5.48	10	145.34	520.39	43.14		
						TOTAL TRANSVERSE LENGTH:	58.15							TRANSVERSE MISCLASURE:			-0.23	-0.36	-0.11

$$\text{Horizontal Misclosure} = \sqrt{0.23^2 + 0.36^2} = 0.43 \text{ or } \frac{0.43}{58.15} \times 100 = 0.73\%$$

$$\text{Vertical Misclosure} = 0.11 = \frac{0.11}{58.15} \times 100 = 0.19\%$$

$$\text{Total Misclosure} = \sqrt{0.11^2 + 0.43^2} = 0.44 \text{ or } \frac{0.44}{58.15} \times 100 = 0.76\%$$

Typical sheet for calculating survey results

- Legend or key- features depend upon whether the survey is a cave or mine
- Datum to which levels are quoted
- Spot levels if required
- Name of underground and surface features of note. (Road names, passage names etc.)
- Limits of survey where workings have not yet been surveyed.
- Acknowledgments to all earlier work that may have been used

When the survey is completed the master copy should be kept safe, a survey serves no purpose other than the satisfaction of the surveyor unless it is published. In the United Kingdom, unlike in many other countries copyright exists automatically in any new work, without any requirement to deposit a copy of your survey at some place to register it. However there is a legal obligation to send a copy of every published work (i.e. any survey made available to others, whether or not it is sold) to the British Library at your own expense. The address to which it should be sent is:-

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In return your publication will be listed in the British National Bibliography. There are also five "privileged" libraries that have the legal authority to demand a free copy if they so wish.

There are various computer programmes available for cave surveying, one of the best is *OnStation* available on the internet <http://onstation.com> This programme requires Windows 95 or NT. The programme handle all the calculations and drawing in both plan and elevation allowing additional surveys to be added at anytime.

Bibliography:

- AN INTRODUCTION TO MINE SURVEYING By R. N. Rushon
- FIELD & COLLIERY SURVEYOR By O'Donahue & Bocking.
- AN INTRODUCTION TO CAVE SURVEYING By Bryan Ellis
- SURVEYING PROBLEMS AND SOLUTIONS By F. Shepard.

The Society has its own surveying equipment, anyone wishing to have hands on practice of surveying techniques should contact the author of this article.

Stephen J Lea, Glan Conwy, September 1997



Members surveying in the Ty Gwyn mine

Symbols for surveys

	Abrupt changes in height greater than one metre that cause an obstruction. The difference in height in metres to be shown either side using + or - signs		The distance, usually zero, omitted on the drawing between the two vertical lines (for use on extended sections only)
	Sand Pebbles		Stalagmite flow on floor Mud or clay
	Steep slope greater than 45° arrow heads point down the slope		Change of survey grade; or any other limit that is wished to show
	Large boulders. The route through a boulder ruckle may be shown by using a thicker line on the appropriate side of the symbolic boulder		Location of cross section with its reference number and showing the direction of view
	Conjectural outline of small areas of the cave where the dimensions were not properly measured		Position of permanently marked survey station whose co-ordinates have been published; not shown if it would obscure other detail
	One passage superimposed on another. The outline of the lower one is shown by dotted line only if this is necessary to indicate a change of shape or direction		Sump or submerged passage; the distance between the air spaces is shown in metres, if the sump is free divisible
	Pool and active streamway direction of flow shown by occasional arrows. Confines of stream shown if scale permits or if the stream proportion of the total passage width		

Departing in the best of spirits, despite the bad weather, our man - who called himself Tor - had food, his small world had grown larger and he was no longer alone.

True to his word Tors' new friend called on him some days later. he was amazed to find how warm the cave was and remarked on the fact it had two entrances. the second entrance was much smaller, and Tor pointed out to his new friend that the draught from the smaller entrance carried the smoke from his fire to the outside. Tor explained that his home also faced the sun at midday when the warmth of the sun was at its greatest, and that the steep slope was a deterrent to predators. Fresh water was a problem and Tor had to make his way down to the bottom of the hill where a spring of fresh water flowed with reasonable regularity. the water which he collected in a skin bag lasted him two or three days. his new friend was very impressed and in due course, after a welcome meal of meat, the two of them gathered up their bows, arrows and spears and set off to the far end of the mountain.

Wending their way up the steep slope above Tors' cave they turned towards the sea, down into a valley and upwards again on to a fairly flat area. As they pressed on Tor noticed two springs and at the second they both quenched their thirst with clear, cool water. A short time later after crossing above two gulleys leading to the sea, they came to a slope with yet another spring at the top of it. they began to descend at this point, then turned towards a high cliff plunging down to the sea. After a few more paces they came to a smallish cave to be greeted with a welcoming shout from the occupant. As he and tors' new friend greeted one another, Tor looked around him and took stock of this new place. the cave did not go very far back into the hill, but to anyone a little lower down the slope it could not be seen at all. tor found out later it did have problems, one of which was having no fresh water nearby, the closest was a long way around the cliffs or up above the cave, and a long uphill climb to a point below the summit. The occupant of the cave was also worried about small predators, as no matter how he tried to protect his meat, these always seemed to know when he was away from his home. tor was able to offer an answer to this problem and suggested he wedged a stout branch, wall to wall across the cave, from which to hang his food and then to wrap thorny branches around each end to stop small animals crawling along it. This must have worked well, for he lived there for many more years.

Tor in the fullness of time found a mate amongst his new friends, and reared a family. As the cave overlooked the marsh the family became known as the "Keepers of the Marsh". They knew all the paths and places where one false step could mean death, the animals that lived there knew these places by instinct, and Tors' family learned from them.

The people who lived on the hill on the other side of the marsh had the advantage of having a valley rich in game just over the hill, and towards the sun at its highest. Even so a few of them decided that Tor and his family were

better off than they and made the crossing to his side, making their homes in empty caves and gaps between the rocks, thus Tors' hill slowly became more populated. Animals living there were hunted almost to extinction and the inhabitants had to find alternative supplies on the marsh.

Tor by this time was coming to the end of his life, but his descendants still lived in the same cave for many years until the family died out.

On the far side of the marsh, and as the sea level had risen considerably, bringing sea food closer, people were finding food easier to obtain.

By now the first occupants had long gone and the cave was being used for burials, and by the fishermen for storing their fishing and hunting equipment, net sinkers etc. many years later it was noticed that the folk over the marsh had amongst them some people who spoke a strange language which caused a great deal of wonder and excitement.

Slowly they began to understand one another and to mix. one important lesson they learned from these new people was how to grow crops and to tame cattle, which eventually made the people of the marsh independent in many ways. No longer having to trust to luck in the hunt, they grew their own vegetables, had a stable economy and so became the new farmers.

Flat areas on the hill with sufficient depth of soil were cultivated, and loose boulders pulled out of the soil were utilised in building low boundary walls. Even the lower slopes encroaching onto the marsh were utilised, as were also those on the far side of the marsh. our friend of the cave in the beginning of the story would have been out of his depth in this new age.

To be continued...

Tom Stone, Llandudno, October 1997