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EXPLORATION REVIEW 1975 - 1981

IMPERIAL COLLEGE EXPLORATION BOARD

1146

With compliments

Dear Shane,

1 – 2 years late, but better perhaps than not at all!

Thanks for your help as speaker.

Love BS

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Foreword

This Exploration Review, marks twenty-five years of activity of the Imperial College Exploration Board. During this time student expeditions have visited many parts of the world and, whether their purpose has been scientific study or spectacular adventure, they have done much to enhance the reputation of University exploration and Imperial College. These enterprising young people have proved to be excellent ambassadors abroad.

The history of student exploration at this College perhaps began with the expedition to Jan Mayen in 1938. However, it was not until 1956 that things got underway on a large scale. Since that time approximately 100 expeditions, comprising over 500 young people, have taken to the field. Places reached and worked in have ranged almost all over the world from just south of the North Pole in Spitzbergen to the Bolivian Andes in South America. Students have visited exotic places from the Caribbean to the Solomon Islands and have explored high mountains and deep underwater.

Those who have gone on an expedition have always felt that it was one of the greatest and most satisfying experiences of their lives. They have found that the basic processes of organisation and execution of the venture created a far greater degree of self-reliance and leadership than they had hitherto known.

The financial assistance of the many Trust funds, commercial organisations and individuals, as well as their invaluable advice, have been greatly appreciated by the students and are central to the success of their ventures. At this time of financial restraint such support and generosity is so vital and demonstrates good faith in the youth of today and the leaders of tomorrow.

The Exploration Board would like to express its grateful thanks to all who have helped our College's expeditions through the last twenty-five years.

Robert C Schroter
Chairman
Imperial College Exploration Board

Contents

Imperial College Expeditions

The following expeditions have been supported by the College:

1938
Jan Mayen Island Expedition – Greenland Sea

1956
Eastern Iceland Expedition
Carmargue Expedition – Rhone Delta
Norway Expedition – Allfonbreen Glacier
Swiss, Himalayan Training Expedition

1957
Karakoram Expedition – Led by Eric Shipton
Ghana Expedition
Arctic Norway Expedition

1958
Ghana Expedition
Norway Expedition – Voss
Eastern Iceland Expedition

1959
Apolobamba Andean Expedition – Bolivia
Azores Expedition – underwater
Greece Expedition – biological
British Guiana Expedition
Eastern Iceland Expedition – geological
Jan Mayen Island Expedition – Greenland Sea

1960
St Kitts Expedition – all women
Around the Atlantic Expedition – Africa and the Americas
Iran Expedition
Eastern Iceland Expedition
Central Iceland Expedition
Cornwall Expedition – underwater
Spitzbergen Expedition
Ghana Expedition
Kashmir Expedition – overland

1961
Beerenberg Expedition – Jan Mayen
Oksfjordjokul Expedition – Arctic Norway
Malta Expedition – underwater

1962
Hornsund Expedition – Spitzbergen
Sicily Expedition – underwater
Southern Ethiopia Expedition
Nigeria Expedition

1963
Beerenburg Expedition – Jan Mayen
Ibiza Expedition – underwater
Lanka Expedition – Ceylon
Malta Expedition – underwater
Sierra Leone Expedition
Stauning Alps Expedition – Greenland

1964
Gicce Cokka Ice-Cap Expedition – Arctic Norway
Cornwall Expedition – underwater

1965
Ghemu-Gofa Expedition – Ethiopia
Morocco Expedition – underwater
Uganda Expedition
Ghana Expedition

1966
Minas de Lipez (Bolivia)
East Greenland
Ife (Nigeria) – zoological
Malta – underwater

1967
Guyana – zoological
Ethiopia
East Greenland

1968
Kenya
Sierra Leone
Malta – underwater

1969
Andean Volcanoes
Iceland Volcanology
Malta – underwater

1970
Hindu Kush
Mauritius
N.E. Iran

1971
High Atlas
Turkey/provence
Uganda

1972
Caucasus (USSR)
Cordillera Real
Thailand I
Thailand II
Malta
E. Greenland
Maldive Islands
Peruvian Andes

1973
Kenya
E. Greenland
Norway
Israel (Western Negev)

1974
Norway
Hinduraj
African Rift Valley
Skomer Island (Pembrokeshire)

1975
Cantabrian Mountains
Loch Ness
Western Negev Expedition

1976
Cantabrian Mountains
Hindu Kush Expedition
Scottish Peruvian Andes Expedition

1978
North Africa Expedition
Arctic Expedition – Svalbard

1979
High Atlas, Morocco
Lapland
Nigeria
Solomon Islands
Joyce Dunsheath Expedition to Turkey

1980
Lake Chad
Newfoundland Expedition

1981
Kenya Hydrological Survey
Oman Geological Expedition

Cantabrian Mountains 1975

John Ashton
Jim Cox
Simon Leach
John Miller (Leader)
Kevin O'Donoghue
Dek Shaw
Nick Shaw
Nick Towers
Pete Townsend
Dick Trimble
Mark Tringham
John Venn
Sue Whittingham

On 5th July 1975, thirteen members of the caving expedition arrived by boat, train, and road at the village of San Martin, forty kilometres west of Oviedo, in Teverga, Asturias in Spain. They had one expedition vehicle, a Ford Transit van, which had carried all the equipment and was to be the only transport while in the country.

The Teverga area had been chosen because, despite the fact that it was only eighty kilometres west of the Picos, no previous expedition had visited the area. It was also fairly high, with a vertical range of 2100 metres. There was one large known cave in the area – Cueva Fresnedo, (length approximately eleven kilometres) but this suggested there would be others. San Martin, the largest of the villages in Teverga, was to be the base camp. It is situated between two limestone gorges, and is above Entrago where the Taja valley joins the Teverga valley.

Most of the time at the beginning of the expedition was spent investigating the Entrago gorge, an extremely impressive feature with steep limestone walls eventually rising to over 1000m above the level of the Rio Teverga. The gorge contained many entrances and resurgences of varying age and development. On the west side of the gorge, entry to Cueva Entrago was gained via an abandoned resurgence. 520m of passage was discovered connecting several entrances to the abandoned resurgences. The survey of this cave later revealed that a dig at another resurgence fifty metres upstream of Cueva Entrago was only two metres from one part of the cave. There are still possibilities for pushing Cueva Entrago further into the west side of the gorge, and perhaps even connecting with the stream that originally formed it.

On the basis of topographic maps obtained from Oviedo University, it was then decided to look at the area to the north west of Pena Gradura, around Sobrecuelo. Here three valleys drain off Westphalian clastic sediments on to the Namurian limestone. At the junction of these three valleys, a large closed basin is formed along the geological boundary, with numerous depressions, the central depression being around 35m deep. This depression is fed by a small stream, but the bottom is filled with rock debris, and was penetrated for only a short distance. There are numerous draughting holes in the surrounding depressions, one of which may eventually lead into a cave draining to one of the many resurgences of the Entrago gorge that are 700m lower down and 3.5 km away. Unfortunately all of the draughting holes were very unstable and would have required careful digging to gain entry.

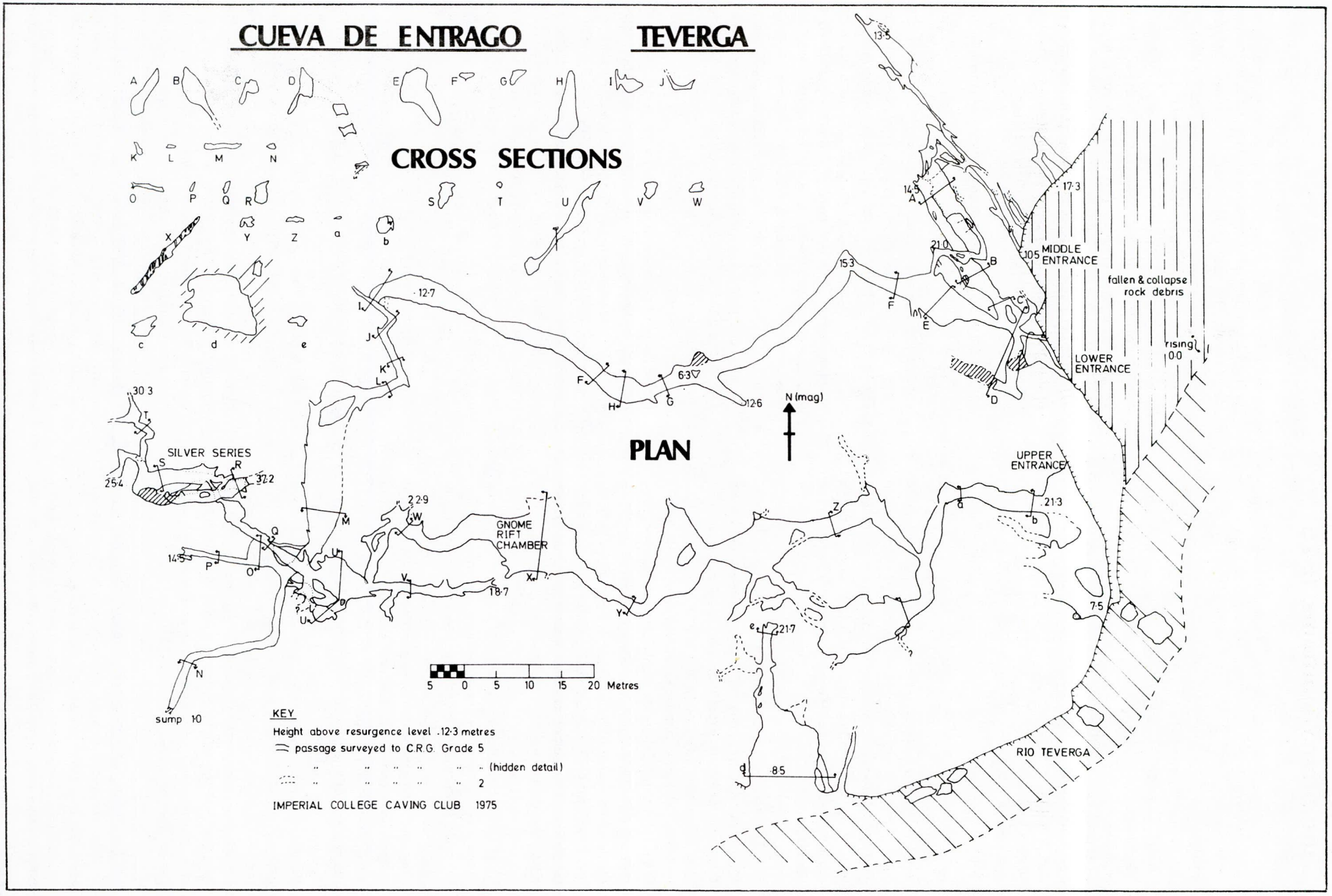
During exploration of the area around Sobrecuelo, the expedition managed to enter other large caves, including Cueva de Wueva and El Cacharro. The entrance to Cueva de Wueva was near the bottom of a large basin situated on the clastic/limestone junction. Eventually 1915m of passage was explored and surveyed to a depth of 85m, 39m of which was the entrance pitch. The last part of the cave contained a passage at least 25m high, trending north east, the present limit of exploration being a sump. Further potential exists for exploration of this cave, particularly the side and roof passages, and the terminal chamber. The sump pool is also large enough for a diver to investigate.

El Cacharro is situated at the bottom of a dry valley. A short dig in boulders led to a cave descending 156m with 525m of passage, trending southeast. Exploration in this cave was also stopped by a sump.

The following accounts of the discovery and exploration of these caves by those who studied them may give the reader some feel for the spirit of caving exploration.

Cueva Entrago

Initial work on the cave was carried out from a conspicuous group of entrances associated with a complex system of interconnecting rifts, these reaching a maximum of approximately 20m above the water-table. The water-table appeared static. Laterally, the rift complex was followed for about 40m, north west before the frequent mud, sand and stal blockages eventually barred the way on. In the southernmost of these rifts at about 10m above the water-table, a branch passage with a water-washed floor was found which obviously discharged water into the rift during flood. After a few metres, this passage suddenly changed direction, to the south west, and began to descend rapidly, the floor becoming extremely muddy indicating that it is an outflow point from a sump during flood conditions. The passage, which had now developed a phreatic tube shape descended to a well-decorated cross rift and a small



mud sump, over which a short squeeze gave access to a continuation of the tube. This tube climbed rapidly via a number of cross-rifts to a low wide chamber, ending at a rift containing fresh stalactites and stalagmites. From this point, a short series of rifts and low tubes, one locality containing a dried up crystal pool, was followed to a climb over clean limestone to a low wide water-washed passage, indicating that the high water phreatic/vadose boundary had again been crossed.

Exploration halted temporarily where this low passage entered a poorly developed, gently dipping rift system, in which a steeply descending muddy tube led to an inpassable sump, the sump lying at approximately the same level as the resurgence.

The section which we called the "Lower Cave", is clearly a flood bypass from the terminal sump. What is not clear, however, is whether this route corresponds with the flow of the main resurgence water (following a phreatic course), or whether the resurgence water flows from a system to the north west of the entrance rift complex.

At the end of the Lower Cave, a tight passage was found leading to a small chamber. A narrow rift in the roof of this chamber was enlarged, and a difficult upwards squeeze passed which led into a new and relatively larger section of cave – the "Upper Cave" consisting almost totally of a moderately dipping fracture zone. The Upper Cave is now a fossil system, and the passages have been wholly or partly filled by sediment. Boulders, sand, mud and rounded pebbles have been cemented by abundant stal floors and drip formations. The stal floors are in places false, and have collapsed. As might be expected the Upper Cave is very well decorated with large stalagmites, stalactites, straws, helictites, cave pearls, dried gours and other more complex and spectacular formations.

After completing a photographic record of the Upper Cave, exploration continued and to the east a connection to the surface was excavated. This new entrance was found to be in the outcrop of the rift/fracture zone about 20m above the Lower Entrance.

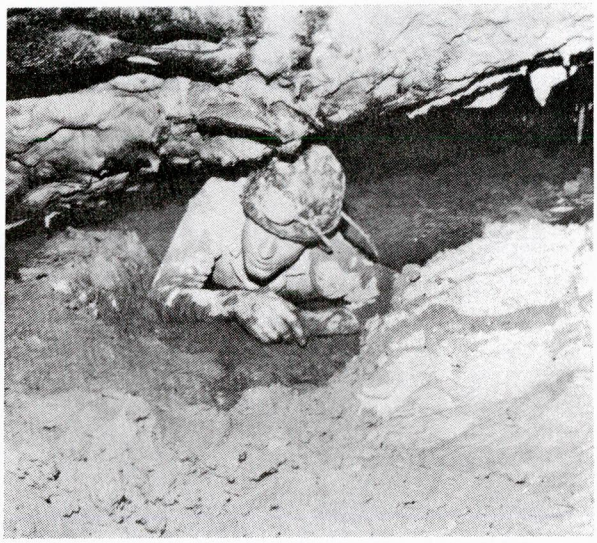
Further extensions to the cave were also made in the west end of the Upper Cave. Digging through rock and stal at a tight squeeze led to the "Silver Series". Here some of the largest passages in the cave were found with a sump resting on a false stalagmite floor. The passages in the Silver Series were finally blocked by mud, gravel, and boulder ruckles, all of which were cemented by flowstone. It is probable that further exploration in this section may lead to the discovery of further passages in the fracture zone, which trends in this direction.

Signs of previous human activity were found near the Lower Entrance but it is thought that we were the first to gain access to the Lower Cave. The Upper Cave was undoubtedly unexplored prior to our visit because both entrances required a fair amount of digging.

El Cacharro

El Cacharro is situated at the lower end of a partially enclosed valley, draining southwards from the south of Caldoveiro and the valley is floored by vegetated drift deposits. A small stream bed is incised into this drift, the stream sinking within a few metres of the pothole entrance. The stream flow was seen to be negligible, nearly all the rainfall percolating directly into the limestone. Inside the cave the occurrence of freshly deposited gravels and boulders suggests that during flood conditions large volumes of water do descend the cave.

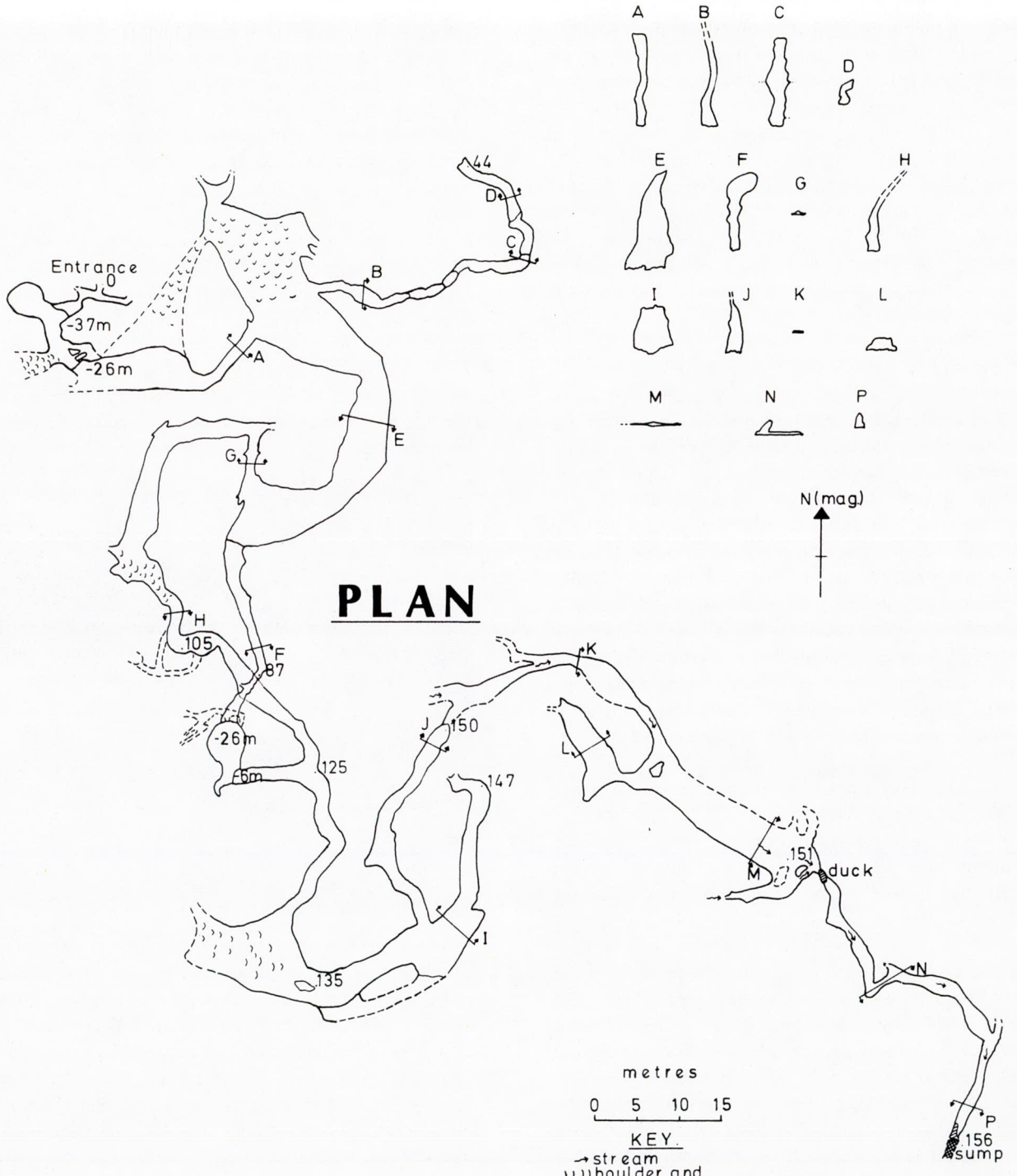
El Cacharro descends steeply to a depth of 150m. A short entrance crawl leads to the head of the Entrance Pot (37m). A rock belay (5m) is available on the left. At the foot of the Entrance Pot, a large boulder-strewn slope leads down to Black Band Pot (second pitch 26m). A large boulder 7m from the head of the pot may be used as a belay. Loose rocks abound at the head of the pot, and great care must be taken when the pot is being climbed.



Below Black Band Pot, large dry boulder strewn passages follow a sinuous course, with major bifurcation in some places. Tonto's Passage may be followed to the head of Tonto's Pot (third pitch), which descends 26m in a large attractively fluted shaft. This pot proved a barrier to exploration until the Bypass was explored. The Bypass leads through a low crawl, and a steeply descending boulder strewn passage, to the base of Tonto's Pot, and on down to .150. Above this point, large passages have formed with canyon and rift type cross sections, passages meander and scalloped walls indicate stream carried detritus, passage floors show typical stepped profile potholes, e.g. the passage above Tonto's Pot.

EL CACHARRO

TEVERGA



Roof and wall collapse is evident throughout the cave, and has probably occurred both during and after the main cave development, thus contributing to passage enlargement. In many places in the cave, large chambers occur with loose boulder and mud tallus slopes leading up. Heavily dripping avens in some of these chambers are an indication of original stream inlets at these locations.

Below .150, the character of the cave changes abruptly, low wide bedding plane passages dip gently downstream. The bedding planes are filled with rounded cobbles and boulders, and exploration was only made possible by pushing the boulders to each side in some places. The inlet stream was explored as far as a sump. Cave development has occurred along the bedding, with some roof collapse. Small active streams now run through these bedding plants.

Cueva de Wueva

Whilst El Cacharro was being explored by the "single rope technique" enthusiasts, surface exploration was extended by others. Under the guise of a geological mapping trip, Nick Shaw and Mark Tringham investigated the ridge to the north east of the Cacharro valley towards Brana de Fuego. Initially, only a number of barren dolines were found amidst a difficult terrain of gorse bushes and rock crags. Struggling to the top of the ridge to gain a vantage point, their efforts were rewarded by a view over a large bowl shaped depression, in which a small stream sank 160m below.

Before descending into the depression, some cave entrances were explored near the ridge. These caves comprised short tubular passages associated with a thick calcite vein. One of these caves had an unobvious manhole sized entrance in a grassy slope, into which Nick was encouraged! Subsequent exclamations included "There seems to be a machine gun in here" and "It's full of bones", and so it was that this 10m long cave was named "Machine Gun Hole", a very rusty machine gun, presumably of Civil War vintage being discovered.

Descending to the base of the depression to where the stream had ended, several strongly outdraughting holes were investigated. One hour's determined excavation led to nothing more than body sized cavities among loose boulders.

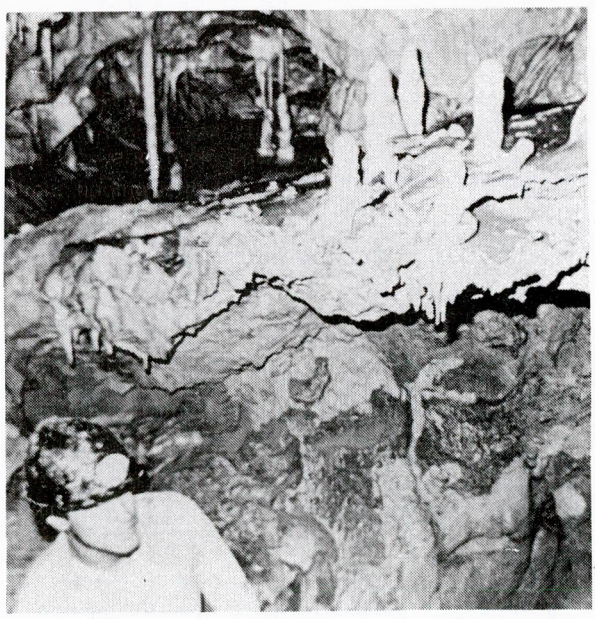
Disappointed by the lack of prospects from these draughting holes at the base of the depression, it was considered time to leave. Then predictably a cave entrance was found some 20m to the north of the digging sites. As was later discovered, this entrance had been visited earlier on the same day by Derek Tringham. The cave was named 'Cueva de Wueva' on account of the wavering vegetation in strong draughts at the digs.

The entrance to 'Cueva de Wueva' is at the foot of a small cliff, removal of vegetation showed a narrow cleft some 3m high, opening out over an overhanging pitch of unknown depth. Stones were thrown down the pitch, and indicated a drop of 40m or more. The entrance was visited next day by Jim Cox and Nick Towers. They were equipped with sufficient tackle to negotiate the entrance pitch to Cueva de Wueva, and exloration began. This was to be the longest and possibly the finest cave discovered and surveyed by the expedition.

Jim Cox and Nick Towers descended the entrance pitch, finding it to be a total depth of 39m, the first 10m freehanging, followed by a steep 4m mud slope, 10m of steep rock and finally a freehang of 15m to a boulder floor at the bottom. A suitable eyehole belay occurs at the entrance, but a 10m rope is required for belaying a lifeline to the nearest tree.

From the bottom of the pitch, a passage led down over boulders, and down through a squeeze into a chamber from which two main routes led off, as well as a boulder choke up. First to be explored was a large meandering passage to the right, after 20m exploration, the wall on the left hand side was a calcite curtain, at the base of which 3 small holes gave access to a tight and sharp phreatic like passage. This sloped downwards at about thirty degrees, and after several convolutions reached a sump, the passage apparently continuing underwater.

On returning to the curtain, some passages apparently led off in the roof and the main passage meandered on for 70m through a crawl to a boulder choke. The size of this Upstream Series passage was gradually decreasing by infilling of stream sediment which consisted of rounded pebbles set in tufa cement.



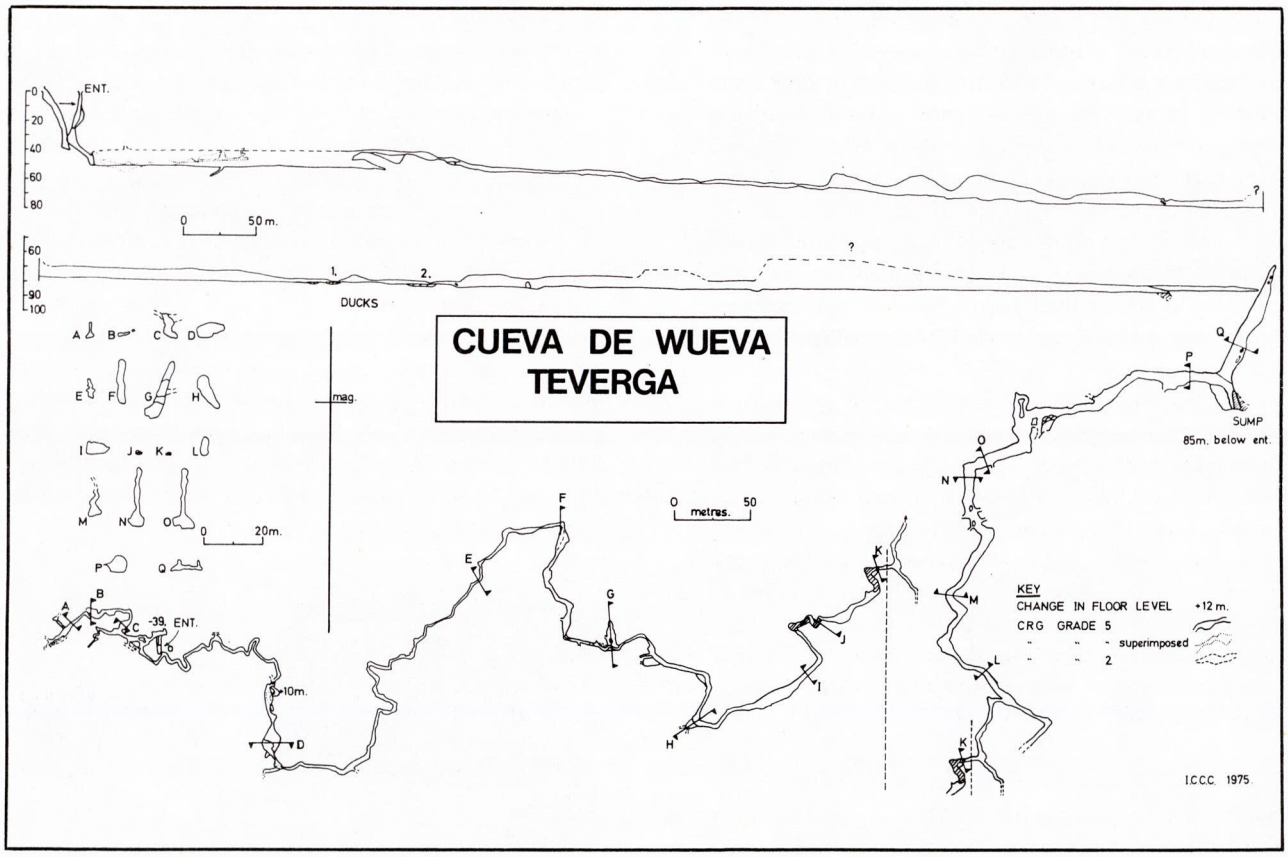
The Upstream Series thus explored, attention was then given to the left hand passage leaving the chamber below the entrance pitch. The passage comprised a gently descending meandering rift passage up to 15m high and approximately 1m wide. Out of phase meanders were developed at various heights in the rift. After 100m a tight phreatic tube led steeply down 13m below floor level. This ended in a series of clean washed tight tubes – presumably a rejuvenated level at which water now flows during wet conditions. The main meandering passage continued for a further 100m, past a stal curtain constriction and an oxbow to a mud choke, where the roof descended right down to floor level.

This first exploratory trip had yielded some 325m of new passage, largely comprising a meandering abandoned stream passage, choked at each end. Satisfied with this, the explorers made an exit, with an hour and a half's walk back over the hills to the van.

The next party to descend 'Cueva de Wueva' intended surveying the passage explored on the previous trip. As is common on such surveying trips, new discoveries were made, which at the end of the day, left a greater length of explored but unsurveyed passage than at the start!

John Ashton, Jim Cox, Nick Shaw and John Venn re-rigged the entrance pitch with terylene rope and descended. At the base of the pitch, John Ashton found a human skull lying on top of a rather loose boulder pile. John Venn followed down and spent some time photographing the unfortunate grave. Nick Shaw and Jim Cox arrived, and when all was done, the four moved down the main meandering passage, and descended the tight phreatic tube in the floor, which had been explored previously.

Surveying began and progressed up to the main passage and from there downstream. After some time surveying, it was obvious that three people working together was the optimum number so John Venn was made redundant, and he embarked on a series of over-exposed photographs. Moving downstream to the stal curtain, his progress was restricted to crawling through a muddy puddle. Having a fear of mud, John climbed into the roof in search of a bypass. At roof level, some 10m above the floor, a passage was found pointing in the right direction which draughted heavily outwards. This passage was followed past numerous gour pools until progress was stopped by a stal barrier. On returning to the surveyors, it was agreed to pursue the new extension – 'The Upper Grottoes' – and break through the stal barrier.



progress was quickly made past the barrier, the 7 lb lump hammer making very short work of the obstructing stal. The route led through a very beautiful chamber, and to yet another stal barrier – again draughting heavily. This was attacked with the lump hammer, and access was quickly gained to another grotto and a 4m descent to a streamway. Upstream became tight after 4m, downstream the passage passed another two sets of cross rifts at about 30m, to another stal barrier and then a further 100m downstream. The barrier was removed again with the lump hammer and progress continued for 30m until stopped

by another stal barrier over a puddle. The way on was visible and the passage was draughting impressively. The encouraging sound of a large waterfall could be heard through the squeeze, and some frantic efforts were made to move the obstructing stal. Alas, this time the squeeze was surrounded by thick stal and attacking this was only possible by lying headlong in the deep puddle. After some 20 minutes work, everyone became cold – no wetsuits being worn, so it was decided to retreat for the day. It was an arduous task climbing out of the system, the entrance pitch presenting some acrobatics for Nick Shaw, as he was not used to SRT techniques. This, accompanied by the cold, was not a formula for speedy ascent.

A very excited descent to camp ensued, with tales of finding the 'master system' through the terminal squeeze. Needless to say, a good night was had by all in the nearest bar!

Two days later, six members – John Ashton, Jim Cox, John Venn, Kevin O'Donoghue, Nick Towers and 'Clog' Leach were at the entrance to 'Cueva de Wueva' equipped with wet suits, with the intention of extending the previous work, and to complete the Upstream Series survey. Once down the pitch, Jim Cox, Nick Towers and Kevin O'Donoghue moved upstream to continue surveying, while the other three, accompanied by the lump hammer, returned to the terminal barrier with the intention removing it!

Within fifteen minutes hacking about, the squeeze 'Hammer 4' was enlarged sufficiently for John Venn to crawl through to the far side. It was soon realised that the previous trip's waterfall did not exist, the deceiving roaring noise being caused by the draught passing through the squeeze, and whistling over the water's surface. After a few minutes the three passed through the squeeze and continued on. The streamway soon opened up into a large passage which was still occ-asionally blocked with stal. The passage continued increasing in size with a number of inlets visible in the roof. At a distance of approximately 600m from Hammer 4, it began to close down, becoming lower and lower until arrival at the inevitable pool of water which was named Duck 1. After much trepidation and waterworks, John Ashton dived through, finding the Duck to be .6m long with 1 cm of airspace draughting strongly. The duck was conveniently lowered from the far side, by digging at the moonmilk floor. progress continued to Duck 2 after which the passage again opened up to considerable dimensions. This large and finely decorated passage meandered on for a further 600m (approximately) to a sump with a deep blue pool of water extending into the depths. An attempt to get through failed, as the roof descended at about 45 degrees for at least 1.5m.

Whilst looking around at this point, a passage to the left (facing the sump) was explored past many beautiful straws as far as a gravel choke, that was again draughting heavily outwards.

On the return journey to the entrance, a few obvious side passages and avens were located and it was concluded that much work could still be done to assess the full extent of this cave system.

Two days' exploration and determined excavation had added over 1,500m length of passage to the previously recorded 325m. Due to lack of time, future trips were restricted to surveying the main route, and cursory exploration of side passages. The final sump was explored to a depth of 4m showing it to be definitely a job for diving equipment.

Loch Ness 1975

Jim Brock
Anne Cameron
Christopher Cockburn
Christopher Reid
Ian White

Our main aim was to provide a survey of the insect fauna of Loch Ness. Because of the unusual climatic nature of the Great Glen, we expected to find species existing beyond the normal northern limit of their range. There was also an opportunity for ecological work, and we were particularly interested in studying the effects of coniferous afforestation on the local fauna. We also looked into the natural history of some little known parasitic wasps. The 'Loch Ness Monster' phenomenon was investigated informally, usually through conversation with local people, and particularly with fishermen.

Our base camp was at Foyens, a small village about half way along the south shore of the loch. As our journeys from base were usually of short duration, it will be more relevant to devote most of our time describing the results of our investigations rather than giving an account of our actual travels. Most sampling was carried out in and around Foyens itself, where we found a surprisingly diverse range of habitats. The river Foyens contains a large deltaic formation at its mouth, and this was found to provide a suitable habitat for many beetles of specialised habits. Some of the surrounding land is under agriculture, but there are extensive deciduous forests running along the loch in either direction, and these mostly give way to coniferous plantations in the higher altitudes. There are some stretches of open moorland, these mostly being found at mountaintops.

Insects were collected throughout this area by a number of different methods, nocturnal moths and other insects were collected with the help of a mercury vapour light trap. A 'Malaise' flight interception trap was used for continuous sampling, and a large proportion of species were taken by netting or searching procedures of various kings.

The other sites we studied were:

Invenfanigag: This area is designated as a site of special scientific interest (S.S.S.I), and was one of the two sites which the Nature Conservancy asked us to survey. The principle interest of this site lies in the exceptional richness of the mountainside birch forest that lies on either side of the chasmous Fanigaig river gorge. The locality is also one of outstanding scenic beauty, although there are signs of unwelcome forestry activities that could have adverse effects on the future of the site.

Urquart Bay: Also an S.S.S.I.: the principle interest is the extensive Alder wood that surrounds the bay. This site is close to Urquart Castle, a few miles from the northern tip of the loch, on the north shore.

Loch Tarff: This is a very small lochan near Ft. Augustus, and about one mile inland of Loch Ness. Its water is used as a reservoir for Ft. Augustus. Due to the abundance of marsh plants, there existed greater potential for aquatic insects there, than in Loch Ness itself.

The following is a summary of our main findings:

1) A number of species were found at Loch Ness, which have not previously been found so far north in Britain. At the same time however many of the characteristic 'boreo-alpine' insects do occur at Loch Ness – even at very low altitudes. A few parasitic wasps collected were new to the British fauna.

2) The plantation of conifers has had extremely adverse effects, both biologically and ethnically. Although a small number of species have benefitted from the introduction of conifers (i.e. species of native conifer forests), a very large number of animals and plants are unable to exist in the plantations.

3) The natural history of some northern conifer beetles and their parasites (wasps) was studied. This was made possible by the 'sink' effect of diseased log poles. Very little is known concerning most of these insects, since their distributional range is limited, and they are seldom seen in natural coniferous forests due to the sporadic distribution of diseased timber.

4) Information gathered on the 'Loch Ness Monster' seemed very polarised towards extreme viewpoints. One 'private investigator' has logged more than 20,000 hours of watching, and has taken several photographs. The local fishermen, some of whom have spent half a century on the loch, treat the whole subject as a joke. On the other hand, there is a reasonable body of scientific data which back up the 'monster' theory; the evaluation of this is beyond the scope of our survey, however!

The Expedition was successful in providing a basic survey of the entomology of a much neglected and highly interesting region. A future expedition could fill in many gaps by collecting material from the earlier part of the year, especially during June. We do not consider 'Loch Ness Monster' objectives worth while for a student expedition that has other duties. If this animal *does* exist, then some sonar-linked aquaphotography would be necessary for its investigation. The recreational aspects of monster-watching are nevertheless much to be recommended!

Western Negev Expedition 1975

Peggy Nuttall
David Price Williams

Juliet Prior
Mark Tatchell

The following short report is of the third season of study of the British Western Negev Expedition. The work was carried out on the area around the archaeological site of Tell Fara, southeast of Gaza. The purpose of the expedition was to extend the reference collection of plants and animals obtained on the previous visits to the region. The month of April was chosen as it was at the end of the wet season when the fauna and flora would be very different to that found during previous visits in July and August. It was also hoped that charcoal samples could be collected so that they could be identified and dated on returning to England.

The Tell Fara region had originally been chosen for study for a number of reasons. It lies in a truly marginal area of agriculture where minor climatic fluctuations would have had dramatic effect on land utilization and the site was known to have supported communities before and since the Bronze Age.

The study during this short spring season in April was very successful. As we had suspected the fauna and flora of the area were very different at this time of year. On arriving in the area we found that the vegetation was a lush green compared with the parched yellows and browns of the summer months. This was particularly so in the area around the wadi. On closer examination it was found that some of the plants were the same species as those found during the summer months, but there were also quite a number of species that had not been seen by us in the area before. The new species were mainly of two sorts. Firstly, there were a number of species of annual plant that have their seeds washed down the wadi by the floods. The second group were mainly of the Compositae. These were found all over the area that we were working in, but particularly in the areas where the water supply was most readily available.

The insects that were found belonged to the same groups as had been found before, but generally the species were different. The other point to note with regard to the insect fauna was that the total numbers of insects was much higher even though the number of species active at this time was very similar to our previous visit. These large numbers of insects were made up from two groups of insects, namely the Orthoptera and the Homoptera. The reason for this is the plentiful supply of food. Most of these insects are phytophagous and it is at this time of year that the vegetation is most plentiful and lush.

During the two weeks that we were working in the area, we noticed a very dramatic change in the overall appearance of the area. By the end of the two weeks the yellow and brown tones of the desert margin were becoming very obvious. From then on the area would be very dry and most of the vegetation would be very dead. These summer months are really unsuitable for animal life and as a result there are only a few animals found in the area.

A number of charcoal samples were collected from known layers that are of archaeological interest. These are at present being identified to determine the main wood species that occurred in these layers. The samples are also being isotopically dated. The information gained from this will also go a long way towards understanding the habitation and vegetation of the area in the past.

Cantabrian Mountains 1976

John Ashton
John Miller
Paul Romeril
Barbara Shaw
Nick Shaw (Leader)
Nick Towers
Derek Tringham
Mark Tringham

We returned to the Cantabrian Mountains of Spain to continue the cave exploration which the previous year's expedition had started. We looked particularly at the area around Arroyo del Cueva, where a large cave had been entered at the very end of the expedition.

To reduce the time spent walking every day to the caves and energy wasted transporting large quantities of equipment up mountains, we chose as our base the village of Tameza. Tameza is located near the top of a very long valley, the only road which reaches it ceases to be metalled many miles down the valley.

We arrived at Tameza in the middle of August and had soon reacquainted ourselves with the area. The local people were very helpful and we had soon been found a field where we were permitted to set up base camp.

We had aerial photographs of the area which were very useful in planning exploration as well as mapping. The cave which we had entered last year was soon re-visited and renamed Cueva Vegalonga (previously Cueva del Arroyo). Its resurgence was found near the top of the valley above the village. The resurgence cave was only about 30m long before the passage disappeared under water. Relict resurgences could be located up the hill side and one of these was explored quite extensively and contained excellent formations and crystal floors.

Cueva Vegalonga had been revisited from Camp Entrance and Tree Pot, and re-explored as far as the sump at the end of Upper Main Drain. We had started to survey the cave but it was decided that as Derek Tringham, a very experienced cave diver, only intended to be in Tameza a short time, he would explore the sump before we had fully explored and surveyed the cave. We had two back up cave divers with us, namely Mark Tringham and Nick Towers.

On the afternoon of August 28th, Paul Romeril, Nick Towers, Derek and Mark Tringham entered the cave with the intention of exploring the sump. Derek entered the sump at about 4:30 pm. He had enough air in his tank to last approximately 30 minutes. He intended to explore the sump for about ten minutes, maintaining contact with the surface through a rope and hand reel. He maintained contact through the rope for a few minutes and then contact was lost. After ten minutes had elapsed, Mark prepared to enter the sump, being first backup diver. During this time, the rope and reel surfaced at the entrance to the sump.

At 4:55 pm, Mark entered the sump, using the same rope and hand reel He searched the sump for fifteen minutes, maintaining contact through the rope, and going about 30m in and 15m down. He found no trace at all of his brother Derek.

During Mark's preparation to dive, John Ashton, John Miller and Nick Shaw had arrived at the sump as previously arranged. They had observed on their descent of the cave that the volume of water passing through the cave had noticeably increased. This had the effect of increasing the sediment load in the water and, as a result of this and repeated diving, the visibility in the sump was now virtually zero. It was therefore not possible to make any further rescue attempts.

We took a spare lamp and attached it to the rope and immersed it as far into the sump as was possible. The idea was to provide a direction finder. We then left the cave, surfacing at 7:30 pm, the water conditions in the cave making the one pitch difficult. Two people checked the resurgence en route for base camp, and the Spanish Cave Rescue was contacted by telephone at 8:30 pm.

The first members of the rescue organisation arrived at 10:00 pm and at 1 pm, the full group had assembled with tackle but no divers. We immediately took them up the mountain, into the cave and to the sump. As soon as they realised the full gravity of the situation, they tried to get some divers.

Unfortunately, it was the weekend of festival and they were unable to contact any divers until the following day. At 1:30 pm, a group of divers arrived who were promptly taken down the cave which was now rigged for a full rescue, complete with a telephone line. It was still raining and conditions at the sump were too bad for a group of non-cave divers to attempt to dive. By this time, contact had been made with a group of cave divers from Catalina.

The Spanish army laid on a DC-4 plane from Madrid to Barcelona and onto Ranon to transport the divers and their equipment. They arrived at Tameza early on the 31st, and were soon at the sump.

Despite the poor visibility, they explored the sump extensively and found that, at depth, it spread considerably laterally in extent and the flow continued

through small openings. It was considered at this time, due to the difficult conditions in the sump, and the time that had now elapsed since the accident, that further attempts would not yield any worthwhile results, considering the risks involved.

During this time and a further day, parts of the cave were explored for a bypass to the sump and all relict resurgences explored to see if the other side of the sump could be reached. The resurgence was also dye tested to check that it was the correct exit for the waters in the cave. It was then decided that all further courses of action were futile and the rescue attempt stopped.

The expedition felt that it could not stay in the field caving and members returned to England as soon as arrangements permitted.

The details of the accident have been presented here to show that the Spanish Authorities were prepared to do anything they could to help us, which they did quickly and efficiently with due consideration to our emotions at the time. It is not normal in England for any members of a party involved in an accident to participate in a rescue, once the rescue team has arrived. This is only possible as the rescue team would know the cave. In Spain, in a recently explored cave, this is not the case and it is a tribute to the rescue team that even though none of us spoke Spanish or them English we were able to undertake the rescue attempts together.

Derek was a very experienced caver who had caved extensively abroad in the most demanding of caves and was also well respected as a competent cave diver. He provided inspiration for many a caver; being a school teacher, he was able to show many young people a different and exciting world.

Hindukush Expedition 1976

Syed Ali
Faramarz Aminpour
Joseph Cullen
David Ellis
Henry Hooker
Denys Whitley

Thanks to the generous help of many firms, organisations and individuals, the Expedition left London fully prepared for the rigours of a long trip overland to Pakistan and six weeks mountaineering in one of the outlying ranges of the Himalayas. The one thing that we could not protect ourselves against was an 'Act of God'.

Three of the Expedition members were transporting all of the food and equipment out to Pakistan in an old, but reliable, ex-army lorry, a K-I truck. The others were to fly direct to the country. Making good time, they were travelling through a small town in Bulgaria when an unfortunate accident occurred. A car, travelling in the opposite direction, mis-timed an overtaking manoevre and drove right under the front wing of the lorry, shearing the axle off its bearing, breaking the springs and bending the chassis. Fortunately, no-one was injured. The Police eventually towed away the car and produced a report which laid all the blame on the car driver, but indicated that the lorry was too big a problem for them. The other driver who was clearly responsible was fortunately insured with a major West German insurance company which has reciprocal links with the Commercial Union Assurance Company. Nevertheless, the claim which is large and complex will take a long time to be settled.

Despite two weeks of tireless effort, on our behalf, by the British Embassy in Sofia, no help was forthcoming from the Bulgarian authorities to facilitate repairs. We were then forced to turn our attention to Istanbul, where, with money, anything can be achieved! Within a week, we had the lorry transported to Istanbul and had it repaired. By this time, we were three weeks behind schedule, which would have cut down our possible climbing time to the point where it would not have been worthwhile. It would take at least two weeks to get sufficiently acclimatised to high altitude for any serious peaks to be attempted and there was certain to be a long wait for room on the plane from Islamabad into the mountains. The determining factor, however, was the opinion of the Expedition mechanic (a professional fitter) that the damage to the vehicle made it unlikely that it would survive the rough roads between Istanbul and Islamabad – four thousand miles.

The only sensible course of action then, was to return, slowly and carefully to London with all the equipment. The behaviour of the lorry on the way back clearly justified that decision.

A couple of weeks after our return, an Imperial College Caving Club Expedition was setting off for the Cantabrian Mountains in Spain. We, therefore, donated or sold most of our food and some equipment to them. The rest was sold off to individuals or retained by the Imperial College Exploration Board for the use of future expeditions.

We were very sad that we had no achievements to report, but expeditions will always be particularly subject to misfortune, and incidents such as this are bound to occur from time to time. We hope this does not discourage sponsors from giving support to future expeditions. Without such help, our Expedition would never have had any chance of success and so we would like to thank again all those who gave us our chance.

Scottish Peruvian Andes Expedition 1976

Michael Papworth
Jim Mc.B.Wilson
Graham Willoughby
Roy Lindsay

Vilcabamba, the ancient stronghold of the Incas, is in the a region of high mountains and deep valleys on the edge of the Amazon jungles. There are many fine mountain groups of which Huayanay, the venue of the Scottish Peruvian Andes Expedition, is one. The area is rich in Inca remains and it was these that attracted Vilcabamba's most famous latterday explorer, Hiram Bingham. The Yale University expeditions, of which Bingham was leader, walked and rode through many of the valleys, following the native trails and were undoubtedly the first European groups to travel some of these ways since the days of the Conquistadors.

Today Vilcabamba is much more accessible than it was in Bingham's day due to the narrow-gauge railway through the Urubamba valley. However, the mountains are still only accessible on foot and burro by journeys of up to a week's duration. Huayanay is one of the most accessible of the group and one in which very few first ascents had been made. For this reason it was chosen by our expedition, which had only six weeks in total available.

It was a day of sultry heat when we left London; one of those days in the middle of the '76 heat-wave with the temperature in the 90's. That day, the first of the expedition, we experienced our hottest weather, hotter even than the Caribbean, where we were to stop for twenty minutes, and hotter than any day in South America. Three of us boarded the plane on the 29th June, the fourth member having left two weeks earlier to prepare the way by buying food and organising burros and loads. This was to be a lightweight expedition taking only tentage, primus stoves, photographic and climbing equipment with us. Everything else was to be brought in Peru. Even so it was very hard getting our equipment within the baggage allowance, and we resorted to wearing most of our high altitude and climbing equipment and carrying cabin luggage consisting of ice axes, pressure cookers and carabiners. Being dressed for sub-zero conditions in temperatures of a tropical level was a painful business. We managed well and to cap our elation we read on the aircraft, in a "Financial Times" report, of the devaluation of the Peruvian Sol by no less than 45%. Our American dollars were looking good.

On arrival in Lima, we experienced no problems with customs and, after one night in the capital, had a wonderful flight over the Sierra to Cuzco. There we were met by Graham, our advance party.

Quiet Cuzco soon was not so. Troops and police appeared everywhere, in groups of two, three or four, manning every street corner; everyone of them was armed to the teeth with weapons from truncheon to machine-gun. Lima was in turmoil, with tanks on the street, people shot and a curfew declared. Unrest was spreading throughout the country; the government had told the people not that the Sol had been devalued but that the American dollar had been revalued. People were upset, but the attempted coup that occurred was unsuccessful and several prominent Peruvians received government-assisted passages to foreign capitals for their pains. Nevertheless, problems were to arise as a result of the troubles, making getting to the mountains more difficult.

Our intention had been to depart for Chillca, at the foot of the Rio Silque and the start of the walk in, on the 1st July by way of the narrow-gauge railway. However, no trains would run and nobody was willing to carry us by truck. It seemed that the expedition was floundering as all avenues of escape from Cuzco were blocked. Then, a contact that Graham had met in Cuzco, a Scots missionary working amongst the Indians, very kindly offered to take us to Chillca in his Dodge pickup. Everything had come right again.

Early next morning, we moved all our crates on to the pavement outside our hotel. We must have given the appearance of constructing a barricade for two heavily armed policemen came over and then, to our astonishment, offered to stand guard over our equipment while we did other things or had a beer.

Our friend soon came. The sun was now well up and the air was deliciously warm. The Dodge was loaded and after much thanks and handshaking we left our two smiling and waving policemen, their sub-machine guns and a small crowd of Peruvians which had gathered to see what was going on.

We were away. Cuzco behind, the road to Pisac and its spectacular Inca fortress, the Urubamba valley and country of such beauty that you have to cling to memories and vow one day to return. The Urubamba valley, that we now entered, consists of a flat plain no more than half a mile wide and contained by sides rising steeply for six thousand feet or more, sometimes to snowy peaks. The Incas settled there and left their mark everywhere in the form of hill-clinging terraces and impregnable fortresses.

On arrival at the valley floor, we came across a group of several stationary motor vehicles full of very worried Peruvians. They informed us that the local people ahead were in uproar and were ambushing vehicles.

We replied that if we all went on together then safety would be assured. They happily agreed if we would go first. Off we went, helmets on and armed with ice-axes and machetes. They didn't follow; such is the Peruvian way!

Happily, nobody was waiting for us but the road was unquestionably blocked. Our return to Cuzco was forced.

A Peruvian Army officer and his men later tried to prevent our return. We took a chance and showed him our "Credencial", which had been given us to allow travel to anywhere we wished and for us to be afforded as much assistance as possible. Luck was with us, he still believed in the Peruvian "status quo", and we were waved on with a warning of shootings and insurrection in Cuzco.

We travelled through Cuzco quickly and left by the road to Anta, a worse but more open road. The sun was now high and hot but the air maintained that wonderful clarity of high altitudes with views, not so much of a snowcapped range but, of individual mountain groups glistening white. That is the essential feature of the range – high, snowy groups separated by deep temperate and jungle valleys. Mountains that are many miles away always seem so near.

The Anta road has a more sudden descent into Urubamba. One can see the town from the lip of the Anta plain, but it is a long dusty road of countless zig-zags to get there. I don't think that we were apprehensive at all as we approached Urubamba; perhaps we were a little numbed by our journey, such was the country we were passing through.

On we went through the deep valley past Inca terraces, past the town of Ollantaytambo and its fort where Pizarro was repulsed. On and on through dirt and dust, fields of maize and pasture, through glimpses of shimmering Veronica or Padre Eterno towering above Chillca the road ahead.

It was four o'clock by the time the Dodge was unpacked. Our friend would have to rush off with already four hours driving in the dark. The locals gathered, smiling and laughing, to see us. A train steamed past us with a cowcatcher on front, bell ringing and people rushing off. The comparison between the Wild West and the region that we were in was always too easy to make.

Graham had arranged for a burro handler to meet us but he was not there. Unknown to us, his brother was there and had tried to make us understand that the animal that he had brought with him was for us. We didn't understand; it is helpful to have a knowledge of Spanish. We ended up manhandling our equipment a few hundred yards up the valley where we camped for the night.

The next day our handler arrived with a horse, a mule and four donkeys and we spent the day learning how to pack them. That was an episode in itself but eventually we became good enough at the job.

On the 4th July, we began our walk in. All of the animals were packed and we started on the dusty, cactus-fringed track up the valley of the Rio Silque. We hadn't gone far when an unfortunate thing occurred with the horse. A rotund lady walked past us and when she was fifty yards to the rear, the horse looked at her, turned and ran after her. The horse ran past, and with a kick and a leap, sent its load high into the air. It landed with a great crash and cloud of dust and the horse disappeared into the distance. We never saw the horse again and the load was transferred to the other animals.

The walk up the Rio Silque lasted three days and took us through jungle and along exposed tracks. Burro's seemed capable of only one speed (very slow) and I doubt if we averaged more than one and a half miles an hour.

Eventually we arrived at our chosen base-camp site at about 3,800m; this was a little low really but as high as the pack animals could go. This site was by a little walled enclosure in a hanging valley and a place where we would have a ready supply of water. Tents were pitched, animals were unloaded; we said goodbye to our guides and proceeded to settle into three and a half weeks in the hills.

The next day a peak above base camp was climbed. It was given the name of Pico Pocho, after our guide, and was about 5,000m high. Our hope had been that the ascent of this peak would give us views of the rest of the group, but we were sadly wrong in this. We resolved to ascend one of the highest peaks which we considered would give a better idea of the topography. One of the biggest problems to be suffered on the expedition was the lack of detailed maps and those sketch maps we did possess were either hopelessly inadequate or erroneous.

On the 8th July, a high camp was established at the foot of moraines and cliffs on the south side of Huayanay IV (5,400m). The camp was provisioned with three day's food, enough we hoped for up to two attempts for the summit.

Huayanay IV is a rock and snow peak which had been attempted in 1971 by another British party. They managed to get close to the summit but were defeated by deteriorating snow. We hoped to overcome the problems that they met with by climbing the mountain from the opposite side where more ice than deep snow would be found. Roy Lindsay and myself were to attempt the ascent while Graham Willoughby and Jim Wilson were to climb Huayanay VI (5,100m) between IV and Pico Pocho.

Between the high camp and the snows of IV lay the lake and high moraines. The latter pitched vertically into the lake but above were at an angle of 45 degrees; they were hard-packed in daytime and frozen solid at night. The snows of IV fell into the lake as a cascade of ice a thousand feet high. The only feasible way to climb the mountain appeared to be an ascent and traverse of the moraine to a graceful dome of snow which would lead to the glacial plateau between Huayanay IV and VI.

At about 03.00 on the 9th July we left the camp in total darkness and began to ascend the moraine in the light of our head torches. It took us nearly three hours to cross about a mile of moraine. The whole was frozen with a thin covering of louvre material on which we slipped and slid. We found our ice-axes essential for the traverse. Periodically the moraine would be dissected by gullies, the smaller of which we could slide into, the larger of which we cut steps in the walls. We were terrified of being pitched into the lake which, unseen, we knew lay up to a thousand feet beneath us.

Dawn was nearly upon us when we reached the glacial snows. A few minutes were needed, not only to equip ourselves but to gather our scattered wits. Then it was light; suddenly and immediately.

It was about 06.30 as we moved together kicking steps up the neve slope leading to the plateau. Already it was warm and we knew that soon the snow and ice would be dangerously soft. We moved together for most of the way and belayed when the ice was steep. The steep ice was of a curious kind; rather like steps which were split at the back from the main mass. We were always afraid that these steps would collapse.

At about 09.00 we reached the summit ridge. There we found a difficult knife-edge ridge of rock and snow and one or two subsidiary tops to traverse to the summit. The snow was not good enough for the traverse and reluctantly we retreated to our high camp.

The next morning we made another attempt but got lost halfway across the moraine. We had to wait until dawn before we could escape. On this same day, the 10th July, we returned to base, leaving the high camp established.

Graham and Jim had on the 9th July made the ascent of Huayanay VI from base camp. They reached the top quite easily but in cold cloudy conditions. This cloud would always come in the late morning as the cold air of the mountains would give way to the warm air of the Amazon Basin.

However, on the 10th July the cloud gave way to rain and then snow and the bad weather lasted for about five days. We didn't venture far from our tents for two days and afterwards took the opportunity to bring in extra supplies during this period.

A second high camp was established under Huayanay II (5,500m) on the 16th July. Graham and Jim were to use this camp for their attempts on II, the first of which would take place over the next two days.

The original intention was to attempt the SE ridge, gained by a gully which ran to the right from the first ice-field of the south face. The ice-field was reached by a loose cleft in the lower cliffs. The gully from the ice-field was abandoned as a route and was soon after swept by an avalanche. Jim and Graham then traversed the first ice-field to a hanging glacier which they ascended to a bivouac site. The next day they traversed leftwards along the top of the hanging glacier to the S.W. ridge where the attempt was abandoned. Route finding was proving a real problem with our mountains so far.

Mankan Pucro (4,800m), a rocky hill, was climbed by Roy and myself on the 17th. Some fine views of the range were obtained; perhaps the best of anywhere for indicating the structure of the group.

On the afternoon of the 18th July, Roy and I crossed the moraines of Huayanay IV to bivouac at the foot of the glacier. The traverse was much easier in daytime, the moraine being unfrozen.

It was a long, cold night during which snow fell; a night so cold that, even being dressed for cold conditions and in sleeping bags, sleep was not forthcoming. At 03.00 we set off and reached the summit at 07.30. What marvellous country! Salcantay dominated the scene and was so near. Huayanay II nd the still unclimbed Huayanay III (5,400m) looked magnificent. We knew we couldn't stay long and reluctantly we left and returned all the way to base camp that day.

Jim and Graham had also returned to base for more provisions and set off for II again on the 21st July. Their second attempt was delayed by bad weather until the 23rd. This time they traversed rightwards across the hanging glacier to ascend almost directly upwards. They had climbed to within 150m of the summit when Jim was hit on the head by a stone and suffered vomiting and dizziness. Another retreat had been enforced.

The successful ascent of II was made on the 29th July. They started the ascent at 21.45 the previous day, after another period of bad weather, and climbed through the night to reach the summit at 07.45. The difficult descent to the high camp took eleven hours.

As well as climbing mountains, a certain amount of general exploration was carried out. Two passes were ascended between Huayanay and Cara Cruz, and the Esquina group was completely circled.

Esquina is an alluring rock mountain of about 5,000m in height which Roy and I decided we would attempt. On the 22nd July we left base camp to try and find our way there. We were lightly equipped for a rock climbing expedition and were surprised to find major glaciers guarding the approach.

Our route had already taken us along ways that were probably untravelled by Europeans, and now beneath us lay a beautiful valley which also was unexplored. We decided that we had to go there.

From the pan above the valley we had views of the other side of the Huayanay range. We could see just how easily the unclimbed Huayanay V (5,200m) could be ascended; and we could see the 600 metres of vertical rock comprising the north side of Huayanay III, easily the most attractive of the three main peaks left to climb in the group.

The valley was easily travelled to the Urubamba valley and there to Chillca and back to base camp on the 24th.

Although Jim and Graham had still to make their ascent of Huayanay II the expedition was effectively over. On the 30th July, our pack animals arrived and we descended the valley of the Rio Silque in brilliant sunshine and under the domination of Padre Eterno.

The achievements of the expedition can be numbered as four first ascents, one first British ascent and some exploration. With more information, another expedition should achieve more. One day there will be decent maps and that, coupled with the accessibility of the peaks and alpine-style ascents, will lead to a wonderful mountaineering holiday.

North Africa Expedition 1978

Liz Banks
Hilary Carter
Sally Carter
Tony Hadley
Natalie Knight
Sarah Oliver
Simon Perry
Andy Pullen
Ade Sudworth

The main objective of the Imperial College North Africa Expedition 1978 was to study markets and the supply and distribution of consumer goods in one or two isolated parts of Morocco and Algeria, with special emphasis on the extent to which modern manufactured goods are used in place of, or in addition to, traditional ones. Necessarily, the logistics of an 8,000 mile journey for nine people, with temperatures varying from below freezing to over 50 degrees C, were a major concern. What follows is a potpourri of some of the more or less memorable moments, with advance apologies to the maligned or misquoted!

How many miles to Hoggar, then?
– three score and ten.
Can we get there by candlelight?
– there, and back again.

There....
– departure one hour late, primarily because we lost Sally with the Land Rover. Eventually found out that they were moving 2 tons (2 bags Andy claims) of Andy's luggage from Beit to Penthouse. Sue and Helen T, Kirpal and a few other friendly faces to see us off. One 'safe journey' card (significantly from Tony's mother), quick pose for a few group photographs, and away.

All the weeks of preparation behind us, weeks spent collecting spares, fitting special parts and overhauling the Land Rover. Actually finding and buying the Land Rover. Writing innumerable reports and requests for sponsorship. Checking injections, booking with Hover Lloyd. Is special permission needed to proceed south of El Golea? (No!). Medicine arriving by special delivery, by hand, by post and by Securicor express. Do we need a tachograph? Putting up the four tents in Prince's Gardens – making sure all the parts were there. How much water to carry? – how much fuel? We had only collected the last supplies (kindly given to us by Cadbury/Schweppes) and the last two camp beds that morning. Then our entry into the '....IC cram as many people and tons of baggage as possible into a Land Rover competition....'. I think we won. There was even room for the nine of us. Just.

The first night....
– was spent quite unexpedition-like in an ancient manor house near Canterbury, the home of our carefully chosen English representative! As Tony records in his journal '....on to Lyminge – Sarah Jane's home where we were well fed and Ade and I had four portions of strawberries and cream each, the men (Simon slept inside a four-poster bed) slept in a caravan and after much tossing of coins and cutting of cards, Ade the double bed, Andy the single and I was left on the floor!' Quite unwittingly, we repaid Sarah's hospitality by purloining a sleeping bag and leaving behind Adrian's newly created shorts. Not exactly fair exchange.

Onwards....
– our journey to southern Spain was without serious incident once Simon had been banned from playing his new mouth organ. The Hovercraft was efficient and boring. The absence of a tachograph not questioned. Channel rain soon gave way to continental sun. Even sooner we lost essential pieces for each of the Primuses. A glimpse of Rouen cathedral, Chenonceau, the bridge at Cahors. From our journal, '....Friday, 28th July. You may or may not have heard of Lascaux, outside of which are some caves containing the most famous cave paintings. What you (meaning us) are almost certainly unaware of is the existence of another Lascaux within 30 miles, which we have just visited in search of the aforementioned paintings, much to the amazement of the locals. We are now en route for the other one....to be continued'.

Well, in the event, we missed the real Lascaux completely, thro' design I think. We drove the wrong way up a one-way hill in Gourdon, but as Simon pointed out, we would not have seen the rather lovely old church or the fantastic view from the top.

Had horse meat and grass stew for supper. Ade, Tony, Hilary, Liz and Sarah went swimming in the lake and escaped without hepatitis, despite warnings from the others.

Camped; Catus
Lowest night temp, 15 degrees C.

Andorra, the first night without tents, the Alhambra, and then....

The breakdown....
– occurred not far north of Malaga. Our trials and tribulations of the next few days are a story in themselves. Sufficient to say that we ended up on the Costa del Sol while the Land Rover was being repaired in Malaga, half a day away by bus. It should have been rapturous, a chance to relax in the warm blue sea, the mountains

behind us, the little cafe on the beach, the free camp site overlooked by fine ruined castle; Fuengirole with its English food, shops, newspapers, Watneys pubs, even the old Spanish restaurant, only a mile or so down the road; but, oh, how glad we were to forsake it all for the open road again, with our new cutch, six days later....

The first night in Africa....
– was marked by Simon's feverish groaning in the isolation tent, having been poisoned by a ham roll crossing the Straits. A quick dash through Morocco, shortage of open banks, profusion of fruit and hash. Spectacular road.

'....an unplanned stop due to a broken fan belt and after much swearing and cursing I got the new one on at the loss of a bit of my front tooth on a front spring....' (Tony)

Saturday, 11th August. Made the border near Ouijda at about 11:30 a.m. It took us one and a half hours to clear both customs posts by which time it was nearly 4:00 p.m. Algerian time – (two hours forward). Stopped for a very scenic lunch surrounded by mown hay/straw fields adorned by a flock of goats plus shepherd. We struck camp about 10 miles short of Sidi-bel-Abbes in a pleasant ploughed field with lots of useful trees dotted around. When we discovered an ant hole just behind the Land Rover we knew that it was indeed made for us. Andy and I put on the side jerrycan holders in preparation for The Desert! We had our usual audience but a seemingly well behaved one. We only just managed to get up the large tent before it poured, but was soon over. Tony and Ade were later 'soaked' under their fly sheet when it rained again. (I owe Andy 10 pounds and 5 dirhams).

Min 19.5 degrees C. Max 34.5 degrees C.

Sunday, 12th August, I had an appalling night, what with the bed collapsing and the metal bits digging in me all night, and the thing sounding like a bellowing donkey as I tried to relieve the pain by turning gently. Then it thundered and, being half out in the rain putting extra pegs in and checking the L/R in the dark.

Dozed for half an hour then got up, walked for a few yards before I found a huge beetle in shoe.

Well, we got away disgustingly late – about 10:30 a.m. Soon in Sidi-bel-Abbes which didn't quite live up to Ade's and my Beau Geste ideas. Filled up with diesel at 35p a gallon. Incl. all six spare jerrys, also water ones. Land Rover still kept going.

Day after day. Hotter and hotter, over 50 degrees C (125 degrees F) in the shade. Land Rover overheating in the strong head winds. Suddenly, '....we persuaded the party in general to go and investigate closer, sure enough it was an artesian 'well' spurting up. Around it was a pool. The water was warm but gorgeous, got absolutely soaked, washed the cheveaux and felt fantastic – we left in much better spirits than on arrival, long live artesian wells! Soon after this our first sand dune was spotted, pale reddish sand, gradually becoming more frequent until quite large hillocks of dunes appeared with lovely tiny willowy trees on them....'

'....long live artesian wells!'

Nights in the desert....
- first find a camp site. Well, no good trying to ask the landowner's permission. You could camp anywhere within thousands of miles in any direction. The choice of the best camp was more of a problem. Sun setting, everyone tired, so – sometimes at 2nd or 3rd attempt – we settle on somewhere. If possible some rocks, for privacy and shelter from the wind and morning sun, some sand for comfort, some wood for a fire.

One area near Ain Salah was so incredibly bleak, we sheltered from the wind behind a pile of roadstone – the only shelter in hundreds of miles.

Tony had this habit of sleeping on top of the Land Rover. We were never sure whether he was afraid of it being pinched, really did prefer hard boards or was secretly at war with the creepy crawlies! The rest of us chose a spot within shouting distance of base and laid sleeping bag on sand or camp bed, according to preference and availability of camp beds.

'....any creepy crawlies down there?'

Meals were good. It got cool enough to enjoy them, dropping to below 90 degrees F when the sun went down. The routine involved getting the two primuses lit, anyone to spare unloaded the Land Rover and started preparing the food.

Tea for eight and coffee for Pullen. Put the tent up for whoever's turn it was to be ill that night. Usually a touch of the old tummy bug, with occasional nose-bleeds and headaches. It only really got bad for two nights in Spain/Portgual on the way back, when only two of us were not ill to very ill. On that occasion we were swigging Guanamycin by the bottle and collapsing a bit like nine pins.

Getting back to nights in the desert, we had fires where we could. Surprising how quickly you can boil water, and cook porage and the most dreadful leathery tinned beefburgers over an open fire. Speaking of porage, through the kindness of one of our industrial sponsors, augmented by a four-fold supply error on their part, we had one hundredweight of the staff (enough for 1792 standard helpings!) Despite this, we continued to enjoy it. To quote Natalie, 'Surprisingly, a mug of porage and

one of hot tea proved to be an excellent breakfast, even in the Sahara. Easy to prepare, nutritious and very filling, we found it set us up for the day. Because of the heat, we didn't want to stop for lunch or eat much and our substantial breakfast and a few biscuits eaten during the day allowed us to wait until we struck camp in the evening before having our main meal of the day'.

The sand-ladders were only used once in anger, despite Hilary's successful attempt to stall in one of the small sand dunes crossing the main road, but they proved most useful for suspending pans over the wood fires.

There are many reasons for raving about the desert nights. The blood red sun setting in a slightly hazy mist, the brilliant stars with constellations never seen by us before, the vivid moon, the pure silence, the freedom to wander off in the warm air, the cool sand under foot – almost like paddling in the sea on a hot summer's day, only dark. The need to crawl into a sleeping bag during the night as the temperature dropped towards 75 degrees F. The need to crawl to the Land Rover for water on the night each of the three cooks in turn, unknown to the others, salted the curry....

It was all very real.

Remembering Ramadan

The Hoggar

Every cliche about the desert is true – its cleanliness, its silence, its beauty. The difference about the Hoggar was that it was cool enough for us to appreciate. A mountainous region of some hundred miles square it actually rained enough while we were there for us to use the windscreen wipers!

Tamanrasset lies on the western edge of the Hoggar, and we spent some time there as part of our study of markets and marketing. Unlike the traditional desert towns of Ghardaia and El Goles further north, present day Tam is something of a boom town with a strong military flavour and a brand new 'international' hotel, which had been opened by the late President Boumedienne only a week or two before our arrival. Despite our lashing out and having an expensive – but rather ordinary – dinner at the hotel, we were refused water – the only time Algerian hospitality really failed us. It led to an exciting slanging match between Simon and the hotel receptionist, who fortunately didn't understand English.

Later, we were entertained to coffee and iced water by a restaurant owner who commissioned us to deliver five packages (three kilos of sugar and two dozen candles) to a hotel at Assekrem, a distant spot in the Hoggar.

We left Tam by a typical desert road, which is no road at all but a choice of ten or fifteen equally unlikely looking tracks. Once the routes to the local cemetery and rubbish dump had been eliminated the remainder seemed to more or less converge. Our first objective was a 'source gazeuse' we had heard about. This was unmarked on our Michelin map – probably because they had never actually found it. Hardly surprising, as it took us ages, criss-crossing a stormy, thorny wadi-filled valley in the mountains. Light relief was afforded by the great camel chase. Two 'wild' camels innocently minding their own business were stalked breathlessly by the majority of the party, only to find that they were hobbled; the camels that is (although Tony's feet had been playing him up for quite a while).

Unlike other famous sources, when we discovered this one, tucked away beneath a mountain, we found that an enterprising inhabitant (perhaps an ex-camel hobbler?) had built an 'Auberge de la Source' all around it. Still, the deliciously fresh sparkling water was free from obvious pollution, and was plain free also, so we drank our fill from a bent aluminium saucepan. This was followed by mint tea Arab style, at very modest cost seated on the ground.

'....take the top off first, Andy....'

In mentioning the Michelin map it is worth noting that we found this generally accurate, especially compared to our other 'detailed maps of the area', the British Ministry of Defence series (and based on American sources at that). The latter are so remarkably inaccurate that one can only imagine that they have been issued with an eye to fooling the enemy rather than helping friends.

Even allowing for the numbing of our sense of discernment produced by several days of flat scorching-hot desert, we found the Hoggar very beautiful. Rising to some ten thousand feet, it's a region of volcanic plugs and cones, sometimes rising sheer from a broken plain. The road was rough (route barree – according to a road sign, but everyone seemed to use it) and badly washed out in places. So rough and rocky as to be largely corrugation free, which was a good thing, as we didn't have the speed to ride them.

After a gloriously cool night under a full moon, with only two serious cases of Tam tummy (Liz and Ade) and Natalie with prolific (high altitude?) nose bleed, we reached Assekrem and delivered the goods. Overlooking Assekrem (at an altitude 2780m) we visited the Hermitage of Pierre Foucault, a small chapel built some 50 years ago and still occupied by one of Pierre's order; les petits freres de Jesus. Pierre Foucault was originally very religious, then cut loose, then reentered the church with more vigour than ever. The chapel, tranquil even in the silence of the desert, was built on a breathtaking viewpoint. We could see almost the whole Hoggar, all shades of blue and purple, brown and orange and yellow.

We retraced our steps a few miles and then struck off on an even more ill-defined track towards Djanet – an ancient town set in the Tassili, an area more beautiful than the Hoggar and famed for its prehistoric cave paintings. In the event, we decided against the final 300 miles of unmarked desert piste to Djanet on two grounds, heat (it was, after all, the worst time of the year, with few, if any, other travellers) and shortage of time, but not before we had reached Ideles – the last permanent oasis before Djanet. In reaching there, we were able to sample the real Arab hospitality when, despite it being Ramadan, a householder in Hirafok ceremoniously made us tea. Although the result of the tea making process was almost pure mint flavoured liquid sugar, it proved most cool and refreshing sitting in the shady courtyard, chatting to the head of the house and his family. This was one of the surprisingly few occasions we had to dispense medicines, one of his wives (or mother?) needing eye drops.

The Piste (it means road)

That day and the next, we experienced the best and the worst of desert roads. Tortuous, rocky, washed out hairpins in the Hoggar, where instinctively the risk of tipping over sideways is balanced against that of smashing the sump; corrugations – only comfortable and still risky if one can 'ride' them at some fifty miles an hour. We hardly ever had a long enough run to get up to 50 m.p.h. but in attempting to do so seemed to be shaking the Land Rover and ourselves to pieces. Remarkably, when Simon's Icelandic sleeping bag fell off the roof (and its loss would not have pleased him), it chanced to hit Liz's projecting arm on the way to the ground, and was recovered; (even more remarkable was the only other loss from the roof, a plastic water container top in Spain, which was actually heard hitting the road behind us). Corrugations alternate with the most pleasurable stretches of firm smooth sand, where one picks one's own route anywhere between rocks or wadis far distant on either side. This particularly suited Sarah's style of driving. She protested that she had driven before, and was allowed to take the wheel for a giddy ten miles.

Fez

Unlike most travellers to Fez, we were fortunate in that one of our party had more or less Royal connections in the city. Any lingering doubts the rest of us had about the value of this connection quickly disappeared when we took possession of a fine house in 'European' Fez, together with resident maid who was actually expecting us. The house belonged to Tony's uncle, Professor Abdulla el Tayib, the former Vice-Chancellor of Khartoum University.

Historic Fez might be only a mile away, but modern bathroom was upstairs! We drew lots. I came last. Ah well, the water never really was hot.

Grime removed, we tackled Fez by night. The Old City exceeded all expectations, size, intimacy, atmosphere, tortuousness, bottom pinching, the lot. Undoubtedly, fascinating. Our attempts to drive out of the place, having got in, far exceeded those of Harris with the woman and the child and the bun in Hampton Court. Passengers were in a state of full verbal mutinty (fuelled by a gang of marauding youths who successfully carried away our GB sign as prize) when we tackled one particular tortuous one-way street the wrong way for the third time. It wouldn't have been so bad if we had not still been looking for somewhere to eat. It got so bad, Simon actually confessed to being lost.

However, eventually we found our chosen eating place. Even now, we protest it was really quite nice. The back room certainly had local colour, with swarms of flies accompanying the cous cous and the other dishes. Coffee for eight (tea for Pullen) – no, that's wrong, coffee for nine. Sally was violently ill before we left the place, but we carried Lomatil wherever we went and Sally out of the back room.

Fez by day was no way less impressive. After Tony spent three quarters of an hour bargaining to get a blanket down to 40 dirhams and two pounds, the rest of us nipped in and bought similar ones for 40 dirhams without the two pounds!

And back again

Regrets? – probably, in spite of our decision being the 'right' one, that we didn't get to Djanet.

The Royal Holloway Arctic Expedition to Svalbard 1978

The Exploration Board made a grant to Graham Bunn enabling him to join an expedition to Spitzbergen was originally conceived by two students at Royal Holloway College and which also included two students from Oxford and one from Bristol. The expedition was very successful and achieved its main scientific and exploration objectives. The expedition scaled the highest mountain in Spitzbergen and carried out a micro-meteorological survey based on a mathematical model developed, but not tested, by the Meteorological Office. The following brief account shows how enjoyable their venture proved to be.

In 1957, an accident at the Windscale Nuclear Plant caused a small cloud of Nuclear material to be released into the atmosphere. The British Meteorological Office predicted that the cloud would move across the North Sea towards Norway, but due to the drag effect of the Cumbrian mountains on the wind, the cloud was diverted to Liverpool. The Arctic Expedition had the task of collecting data in ideal conditions concerning this phenomenon and to climb Svalbard's highest mountain, Newtontoppen.

The Expedition began on 3rd July, 1978 when the 6-man team left London Airport on a Scandinavian Air flight to Longyearbyen, Svalbard. At Longyearbyen, the local authority's indecision over camping permission meant a sleepless night huddled inside a large packing case, before we made a 5-hour boat journey to our Basecamp Huts at Brucebyen, 500 miles from the North Pole. We were greeted by scores of Arctic Terns which proceeded to attack us, dive-bombing as we off-loaded our stores into small rowing boats for transport to the shore. (Very reminiscent of Alfred Hitchcock's film 'The Birds'). After a member was hit on the head by a diving Tern, climbing helmets became the order of the day whenever venturing from the Huts.

During our stay at the Huts, we were visited in dramatic fashion by a Russian 'Tug Boat'. Apparently, it was standard fashion for them to sail directly at the shoreline and up the beach! The three Russians that emerged spoke a little English and it was subsequently established that one was a KGB agent.

During the following two weeks, we labouriously backpacked in relays, 1,000 lbs of supplies over the moraine and up the Glacier to a dump camp. The terrain was difficult to climb and the work gradually sapped our energy. Eventually, enough equipment had been accumulated at the dump camp to pack the sledges and start the long haul towards Astronom, the primary site of our Meteorological research. Part of our training prior to arrival in the Arctic had taken place at Windsor Park and consisted of hauling a large slab of concrete from waist harnesses over rough ground.

The weather rapidly deteriorated as we hauled the sledges up the final section of the Glacier towards the ice cap. In the first hour we hauled one mile, but it took us the rest of the day to complete the next. In appalling conditions (snow knee deep, using snow shoes and five yards visibility), we only managed 0.4 mile the next day. We decided to stop and wait for better conditions, but three days later, morale had dropped and there was talk of turning back.

Suddenly, the mists cleared and at 12 midnight, we began the 'journey of a lifetime' (to quote Rob), hauling the sledges using our skis, through the Arctic night. (There is 24 hours broad daylight in the summer months.)
Whilst travelling, a constant problem was to minimise sunburn. Although the air temperature would be -10 degrees centigrade, the sun would reflect off the ice or snow and in the rarefied atmosphere, the transmission of U.V. light was very high. This caused one member of the expedition to suffer from slight snow blindness which lasted for several days. Fortunately, the medical member of the expedition had the appropriate ointments to treat this condition.

With superlative views of two hundred miles in every direction, we hauled for two days covering 25 miles. The weather began to deteriorate and the ground suddenly appeared to fall off rapidly in the murky visibility. Instinct and safety consciousness made it necessary to stop immediately and camp. The next period of clear weather revealed that our camp was sitting on the top of a high ice cliff surrounded by deep crevasses. Another 30 yards and the expedition could have lost half its members over the edge.

By now all sense of circadian rhythm was lost – if the weather was good we would haul, if bad we would sleep. We were, so to speak, suffering from continual jet-lag. After negotiating the cliff and sending out route finding reconnaissance teams, we hauled the sledges to an 'ice base camp' near Astronom. It had taken 9 days to complete the 32 mile journey.

We had not seen any Polar Bears – something for which we were all thankful, even though we had taken a rifle. We were to hear that two Norwegian Explorers had been dropped off at one of the islands with three weeks' food. The boat did not return as planned, and after seven weeks, both men were out searching for food when a Polar Beer attacked, killing one of them. After nine weeks, miraculously a passing yacht spotted

the tent and rescued the lone survivor.

During the following two days, we surveyed Astronom, made supply dumps, built a bivouac survival shelter on the top and carried out research for the Meteorological Office. By now everyone was completely shattered, as we had been pushed to the limit whilst the weather remained favourable – we all desperately needed a rest.

The mists ominously closed in, engulfing our camp, and after five days lying trapped in our tents, spirits began to drop. The winds dramatically increased and the chill factor brought temperatures down to -40 degrees centigrade.

An unexpected difficulty which caused problems, was that of answering the 'calls of nature' during a blizzard. Exposed parts were restricted to an absolute minimum for the shortest possible time. A phantom snowball thrower was usually lurking behind the tents waiting to hurl missiles at unprotected parts! The enforced leisure hours were spent manufacturing chess pieces, reading and debating the 'Problems of the World'. After eight days the topic of conversation turned to the quantity of food we could allow for our return journey. Each food box was rationed from 4 to 8 days to allow us more time to continue our research. It was decided that we could only remain another 4 days before attempting to return.

We woke on the 12th and the last day, after 11 days of white-out and blizzard conditions, to glorious weather! Ironically, the wind had stopped, totally ruling out any further Meteorological research. After breakfast at 1 o'clock in the morning, we skied the 14 mile trip, avoiding many dangerous crevasse belts, to Svalbard's highest mountain. The 'ice cliffs' of the south-west face were scaled for the first time and the summit was reached in clear visibility. Suddenly, our morale was transformed, as we danced around on the summit. The view in all directions was quite unbelievable and the feeling of isolation 'total'.

With limited food stores remaining, the need to reach base camp became more urgent, which enforced hauling in otherwise forbidden 'white-out' conditions. For the return journey, the two sledges were joined together so that five men were pulling, whilst the navigator skied at the rear, directing operations with the use of a compass. During the next 50 hours, we hauled in visibility of 15 yards with the constant call of the navigator shouting 'left-a-bit' or 'right-a-bit'. We were able to plot our exact position with the aid of a bicycle wheel which was attached to the rear of the sledges and recorded the distance travelled. It was affectionately known as the 'prayer wheel' as we prayed we were going in the right direction! Eventually, we realised that the top of the Glacier had been reached. To much laughter, one member declared that 'he would have a baby' if we went over our previous Glacier Camp after navigating blind for so long. The next day the cloud cleared and we passed directly over our old camp and returned to the huts, covering what had taken 6 days on our outward journey.

Apart from the success of Newtontoppen, we had achieved one and a half Meteorological surveys, the results of which are now being analysed in the Meteorological Office computer with the hope of more efficient weather forecasting in the future. This expedition has been an achievement for us all as individuals, but an even greater one as a team. We had worked together for eight weeks, 500 miles from the North Pole in weather which, though not extreme, seemed to taunt us in everything we did.

High Atlas, Morocco 1979

S Akerman
N Avery
C Birkhead
W Coles
J Harrison (Leader)
I Reid
J Roberts
H Sloan
K Wilson

The expedition was prompted by the results of the 1971 Imperial College expedition to Morocco, which briefly visited the Southern flank of the High Atlas mountains, but could not reach any limestone areas through not having a heavy duty vehicle.

It was decided from the outset that the expedition should concentrate solely on the exploration of the Gorges of Dades and Todra, and the location, exploration and surveying of any caves occurring in the areas. With this objective in mind, a College long wheelbase Land Rover left for Morocco with five members of the expedition on board, the other four members travelling by public transport.

Our base camp was set up in the Gorge du Dades, approximately 35 km up the valley, north of Boomalne. The area we explored was composed of Triassic and Jurassic limestones, generally thickly bedded, and subjected to fairly intense folding, with some faulting. Within a few days of being in the gorge, it became apparent that exploration was not going to be easy. The baking heat (we later found out the shade temperature was around 45 degrees centigrade) and direct sun experienced every day was sapping everybody of strength and enthusiasm, and the relief meant that it would take at least a full day to climb out of the gorge we were in. However, by starting out at dawn, it was found to be possible to reach a promising area about 200 m up the side of the gorge, and to explore the surrounding area.

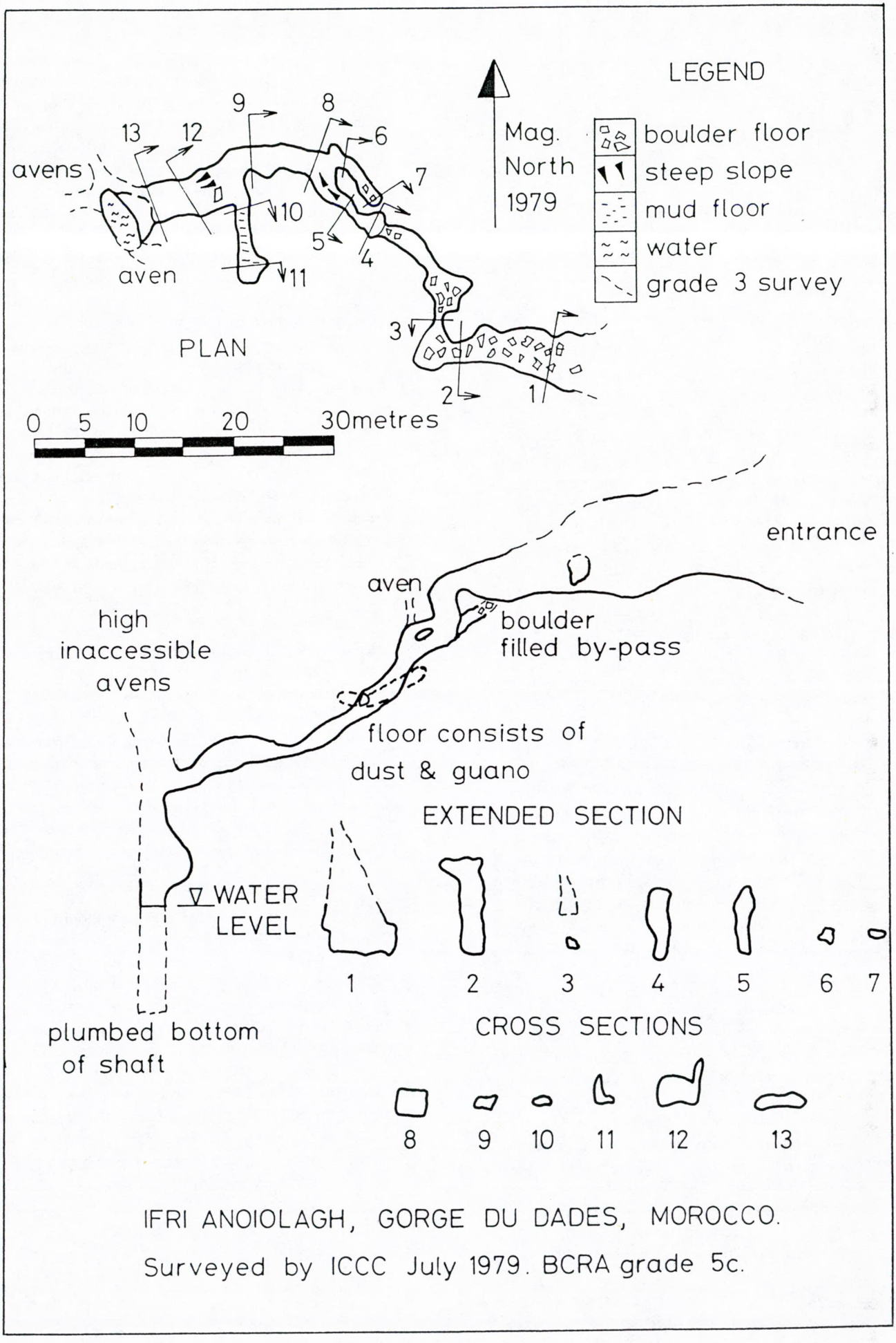
Very quickly, we were finding small solution passages in the rock, most of which were too small to pass through. The first cave we found, Grotte des Unites, was entered via a very tight rift into a chamber which appeared to be a widened part of the same rift. This chamber was about 15 m long, and about 5 m high, varying in width up to 5m. Three ways on from the chamber were discovered, but all of them were choked with calcite formations after only a few metres, although continuations could be seen. The whole of the cave was very well decorated, including a calcite pillar, some 4 m long, 0.5 m thick and about 4 m high.

During a weekly trip to the market at Bovmalne, a number of features were noted which indicated the presence of caves and these were duly explored on the return journey, along with a large cave entrance we first saw on our way up the gorge. Unfortunately all but the cave entrance turned out to be rock shelters used as goat pens by the local berbers. However the long cave proved to be very interesting. From a large entrance in the valley side, the cave descended steeply, ending at a pitch of about 10 m, at the bottom of which was a stagnant pool, which was plumbed to a depth of 11 m. Two major sets of ovens were noted, one corresponding with the entrance, the other with the terminal pitch. Those over the pitch were the home of a colony of bats, and consequently climbing them was difficult, due to the liberal coating of guano on the rock. The entire floor of the cave was covered in a very deep layer of dust and fine sand, with the exception of a small side passage, which was a phreatic tube half filled with moist earth. Exploration revealed another side passage, leading upwards and blocked with goat and sheep bones, which must have fallen in from the surface at some time. The areas over the terminal pitch were the site of intense activity as various methods were used to climb them, but all failed due to the very loose state of the rock.

A local French-speaking Berber told us the cave was known as Ifri Anoiolagh, and told us of a huge system high up the side of the gorge, Grotte D'Ouaounifri. The following day a party set off at dawn to reach the cave – only to find it was a deep rock shelter. However, grovelling around in the end of the shelter revealed a small hole through into a large well decorated chamber. No way on could be found, although several attempts at climbing down through the boulder floor looked promising, but were thwarted by boulders too large to move.

Towards the end of our stay a local goatherd showed us another cave, Ifri Nyovgadne, which he used as a goat pen, but when we explored it, we found it to be just a large chamber, with another chamber off it. On top of these discoveries, we located many small passages, rifts and chambers in the side of the gorge, but nothing more of any extent.

After exploring the area as thoroughly as we could, we reached the conclusion that although we didn't find any extensive cave development, exploration on the plateau, which we found inaccessible due to the relief and the heat, may prove worthwhile.



Lapland 1979

Jeffrey Bates
Joyce Bates
Duncan Garrood
Simon Newell
David Partridge (Leader)
Jane Robertson
Linda Williams
Imogen Yates

In the summer of 1979 a team of six second year students conducted an expedition to the Abisko National Park in Swedish Lapland, where they carried out a number of botanical and zoological research prohjects. The four zoologists investigated various aspects of the ecology and behaviour of the infamous Lapland mosquitos, and botanical investigations included a study of the distribution of seeds and other diaspores in alpine and sub-alpine communities. In addition, the expedition was joined by a lecturer in plant ecology from College and his wife, who in addition to aiding the student botanists carried out studies on the photosynthesis of bryophytes.

Preparations

The most hectic and precarious times for any expedition are the few weeks just before the team leaves for its destination. But planning and preparation for the IC Lapland Expedition began the summer previous to our departure when the ideas for the research prohjects were formulated and scientific contacts were made. Letters and prospectuses appealing for funding and support were sent over the next few months to various industrial firms and charitable institutions, and met with moderate success. Although some food was donated by sympathetic firms, the bulk of our supplies were obtained from a local cash and carry.

Expedition members, many of whom are keen hill-walkers and field naturalists, supplied much of the required field equipment, but the Exploration Board kindly loaned to us some of the more specialised items of hardware such as a field tent, tools and butane stoves. Much of the scientific equipment was loaned by the Departments of Botany and Zoology and the College Health Centre supplied many of the important medical supplies. Unexpected help came from the U.S. Navy who supplied us with a sample anti-mosquito jacket.

In the frantic few weeks before departure, all the food and equipment was packed and stored in the team's flat in Hammersmith, train tickets were booked, customs forms were procured, tetanus injections (and sore arms) were obtained, and the freight was sent on its way to Narvik. Pre-expedition administration was perhaps a litle more than we had bargained for, but thankfully, all went without mishap.

The Journey North

Finally, on June 24th, the advance team departed London by train and ferry and embarked on a four day journey through Hoek-van-Holland, Hamburg, Copenhagen, Stockholm, and northwards through almost endless stands of pine to arrive at Abisko Ostra Station in northern Sweden, 35 miles east of Narvik and 125 miles north of the Arctic Circle. It was the advance team's task to set up base camp, to locate likely sites for prohject work and to initiate those investigations requiring long term measurements. In addition, the team made a foray, by train, into Narvik in Norway to pick up the freight, sign more customs declarations and supervise its loading onto another train to take it to Abisko.

The remaining three members, who had stayed behind to attend compulsory field courses, left for Sweden on July 12th. Dr. Bates and his wife made their way independently to Kiruna, the nearest large town, by car and arrived at Abisko on July 28th.

The Expedition Site – Abisko National Park

Abisko National Park consists of approximately 29 sq. miles of picturesque mountainous terrain to the south of Lake Tornetrask in Northern Sweden. The valleys are dominated by low birch scrub which gives way with altitude to alpine meadows full of rich mountain wildflowers and eventually to lichen heaths, so characteristic of tundra areas. Geologically, the area consists principally of schistose rocks, similar to those comprising most of Scotland's highlands, and garnets are common on the upper slopes.

Abisko itself was, perhaps disappointingly, quite a bit more civilised than we had envisaged. Our arrival was heralded by the roar of bull-dozers and earth-moving equipment plowing a new road along the south shore of Lake Tornetrask to connect Kiruna with Narvik. A ski-lift was positioned a few hundred yards from a large hotel full of a not inconsiderable number of tourists from Germany and southern Sweden. Even the Royal Swedish Academy of Sciences 'small scientific outpost' turned out to have facilities rivalling those of Imperial College.

The expedition team spent their nights 'under canvas' in their own lightweight mountain tents just outside the boundaries of the park. Cooking for the most part, was performed in pairs inside our large Black's Stormhaven (or mosquito-haven!). The food we brought with us consisted almost entirely of freeze-dried meals, but this was occasionally supplemented by local produce such as reindeer meat. Prices thwarted us from obtaining

many treats from the local hotel. (Beer at one pound fifty a half pint!) Abisko has surprisingly few fast-flowing streams and our water was obtained from a pump supplying a pair of nearby mountain huts.

Mosquitos were discouraged from arms and faces by mosquito netting, a liberal application of flypell, and some locally purchased jossticks which, when lit, were most effective in removing unwanted 'mozzies' (as they as affectionately known) from any tent.

Scientific Projects

Lapland has much to offer the field naturalist and indeed the expedition encountered many unique plants and animals which, although they lay outside the scope of the prohjects per se, added much to the atmosphere and enjoyment of Abisko. Elk and caribou were not uncommon and the forests abounded with some of the most enormous mushrooms we have ever seen. Unhappily, 1979 was not a Lemming Year for Abisko and hence many of the more unusual predatory birds failed to establish but the local residents all agreed that the mosquitos were particularly prevalent. This delighted the zoologists, for their prohjects were to centre on the biology of these blood-sucking flies.

The scientific research prohjects that we undertook were developed in close collaboration with entomologists and plant ecologists at College and the British Museum (Natural History). The activities may be grouped as:

Zoology Projects:

1) The distribution and relative densities of various species of airborne adult mosquitos through altitude habitats and season.

2) The distribution of mosquito larvae and the choice of mosquito breeding sites in relation to physical and biotic factors.

3) Biting cycles of northern mosquitos.

Botany Projects:

4) The dispersion of seeds and other diaspores in subalpine and alpine communities.
5) A study on the photosynthesis of northern bryophytes.

The success of these prohjects was, predictably perhaps, rather mixed. The floral diaspore prohject went very well and should yield quite a bit of useful information. The bryophyte prohject was hampered by the breakdown of an essential piece of scientific equipment just before our departure and so a cruder makeshift analysis was performed. The mosquito studies, while not entirely unsuccessful, were affected by an unexpected crash in numbers following a cold snap in the first week of August. Such are some of the difficulties facing scientific work in the Abisko area!

Conclusions

How does one measure the success of an expedition of this sort? Certainly, all members of the team enjoyed the trip immensely, but additionally (at the risk of sounding melodramatic) I believe that each participant gained something of a feeling of achievement, despite the mixed success of their research prohjects. If nothing else, all parties must have emerged with a greater insight into the difficulties of work in the field.

Personally, in my unbiased position as expedition leader, I consider the expedition to be a great success. Even to have departed London and arrived safely back, not without a few 'adventures', but with no major mishap, was enough to boost my own self confidence, and I'm sure that of my colleagues, quite significantly. And I am enough of a romantic to admit that there is something about the tradition surrounding British expeditions, at all levels, that makes me happy and proud to have been associated with our modest foray northwards.

I would like to take this opportunity to extend my wholehearted thanks to all who gave their assistance, in whatever way, to our expedition. Your cheerful support was greatly appreciated and I, and the rest of the team, hope that you will continue to support British university expeditions in future years.

Nigeria 1979

Angela Hey
Alan Mill

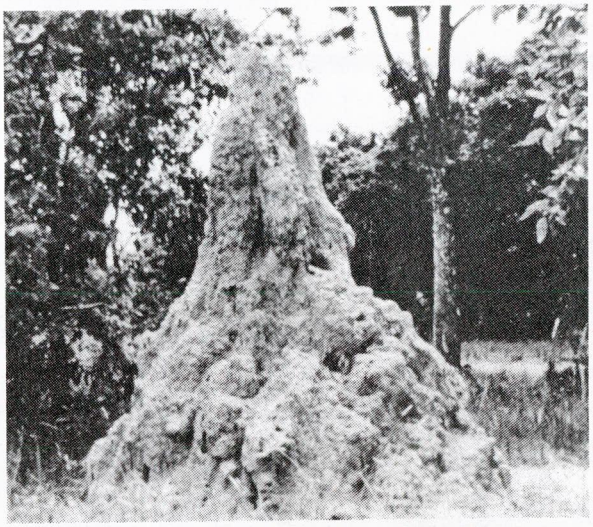
At the spacious, modern Murtala Mohammed International Airport, Lagos, a driver from Costain (West Africa) welcomed us at 1:00 am. It had been a long day: the mosquito netting had not arrived because of a postal strike and double-sized nets were all that could be purchased a few hours before departure. At Gatwick two members of the expedition arrived sans baggage saying that they felt unable to come to Nigeria because further finances were awaiting collection there and also recent press reports spoke of political uncertainty and forthcoming elections. Remembering that the 1966 IC expedition to Nigeria had been caught in a coup they decided to stay behind. The charter flight, on a British Caledonian Boeing 707, took off after 2 hours delay and we were entertained with a film of John Buchan's "The 39 Steps" that showed shots of Imperial College.

At Apapa the driver took us to a Costain transit flat where we spent the next two days. We woke to an English breakfast and torrential rain. In Lagos, we collected funds, booked our train one day in advance and toured the city centre.

Past tropical rain forest, then savannah vegetation, the train went at about 45 mph. Our first class compartment was clean with four seats and a private toilet. The journey lasted from midday to afternoon a day later. At night the train was an excellent light trap for catching insects. A taxi at Zaria, our destination, took us to staff housing for Ahmadu Bello University. Alan had visited here on a reconnaissance trip, the Christmas before, when he had made several useful contacts. We stayed with John Deeming, a British entomologist at the university. Acclimatisation in Zaria included an audience with the Emir of Zaria who gave us a leather holdall and a python skin handbag. In Kano, which we visited for one day by taxi, we collected additional funds. We had received no final confirmation from the agricultural college at Bakura, where we hoped to conduct entomological experiments, that we were able to stay there. After consulting several staff at ABU we decided to leave Zaria by Ford transit minibus to a Sudan savannah region 90 km from Sokoto.

The journey from Zaria to Bakura took all day, not least because we had to change vehicles at Gussau at midday when most of the drivers took a sleep. The journey was interrupted with stops for prayer, as many of the Hausa people travelling with us were Moslem. At the agricultural college official permission for our stay had not been approved. As it was late Friday afternoon when we arrived temporary accommodation was provided a few kilometres from the college at the end of a laterite road. There were about twenty houses in our compound, some larger than others, and they housed workers for the Sokoto-Rima Basin Development Authority. Many of them were engaged in building the multi-million Naira Bakolori Dam 20 kilometres away and the others were working on irrigation prohjects. We had electricity half the day and our two bathrooms had running water until the water pump broke for three weeks.

Alan had to make the journey to Zaria to get official permission for our stay, only to find that a letter giving it had been sent from ABU to Bakura, but it had been delayed in the post. We learned a little Hausa and discovered the nearest village was accessible by a large dug out canoe. We drank chlorinated water and ate bread, millet, rice, onions and lentils. The nearest market was in Talata Mafara on Tuesdays and Saturdays, 20 kilometres away. The principal of the irrigation college, Alhaji Raffin-Dadi offered us the use of his Suzuki jeep and driver.



From Bakura we were able to visit Sokoto. This important trading town is famous for skins of the red goat that are exported across the Sahara. We bought leather goods in the market. At an international hotel we sampled Goat's Meat Pepper soup made from a whole goat (guts, brain and meat) in a chilli and tomato sauce. This was followed by Yam Pottage, yam and meat in a hot chilli and tomato sauce. We also bought local tree fruits which were nearly all stone and made the mistake of buying a vegetable that tasted like tea, instead of spinach. We were taken into the bush to look at termite mounds with an agricultural expert who had a keen interest in snakes. We found two saw-scaled vipers, some of the most poisonous snakes around. We also made butterfly nets and collected many colourful specimens.

The main purpose of this expedition was to study termites. Our first attempt at breaking open a

Macrotermes mound was disastrous as we nearly broke the Nigerian hoe on the concrete-like structure. This led us to buy a pickaxe and shovel which later enabled Alan to find the royal chamber in a mound where the queen termite is attended by numerous workers. We searched for wood baits for termite feeding habit experiments. First we tried to cut local wood from the African locust bean (Parkia clappertoniana) but to get 200 pieces of equal weight would have taken us too long. We decided to bargain for planks which Alan sawed into blocks and set out in seven sites in a grid pattern. For thirty days the blocks were examined every 48 hours to determine which species of termite were attacking them. At the end of the thirty day period the blocks were weighed to determine how much wood had been consumed. Seven species of termites were observed and Microtermes spp. were found to be the most destructive in the area.

The second experiment performed on termites was concerned with the soil runways. The termites often make sheets of soil on the surface of vegetation that they can move underneath, protected from the sun and at a convenient humidity. Some of these soil sheets were destroyed and the amount of soil replaced was measured. It was found that often the full sheet was not replaced. The soil sheets were destroyed by Alan daily and it was found that initially the termites recovered a large area, but that areas covered on each successive day decreased steadily.

The third termite prohject was the study of dissected Macrotermes mounds. Many other arthropods were found in the nests and classified. One of the Collembola collected was the first of its kind to be found.

Other prohjects included collecting beetles and studying sandfly ecology. We were aided in the first prohject by eager locals who also brought us moths with battered wings from the electricity generator to which they were attracted by the bright light. The aim of studying the sandflies was to try and determine whether sandflies carry the parasite Leishmania in Northern Nigeria. Nearly 50 specimens were collected, but as none of them had taken a recent blood meal, it was impossible to find out whether or not they carried the disease leishmaniasis.

We returned home at different times. Angela took the bus from Kaduna to Lagos. The start of the journey was delayed whilst the driver drove round Kaduna looking for sidelights. The bus then stopped for two hours on the outskirts of Kadura to repair the brakes. Both of us had delayed flights on the way home, but at 3:30 pm on 12th September, Alan arrived at Stanstead thus completing the fieldwork of the expedition. Report writing, letters and trips to the British Museum concluded the study.

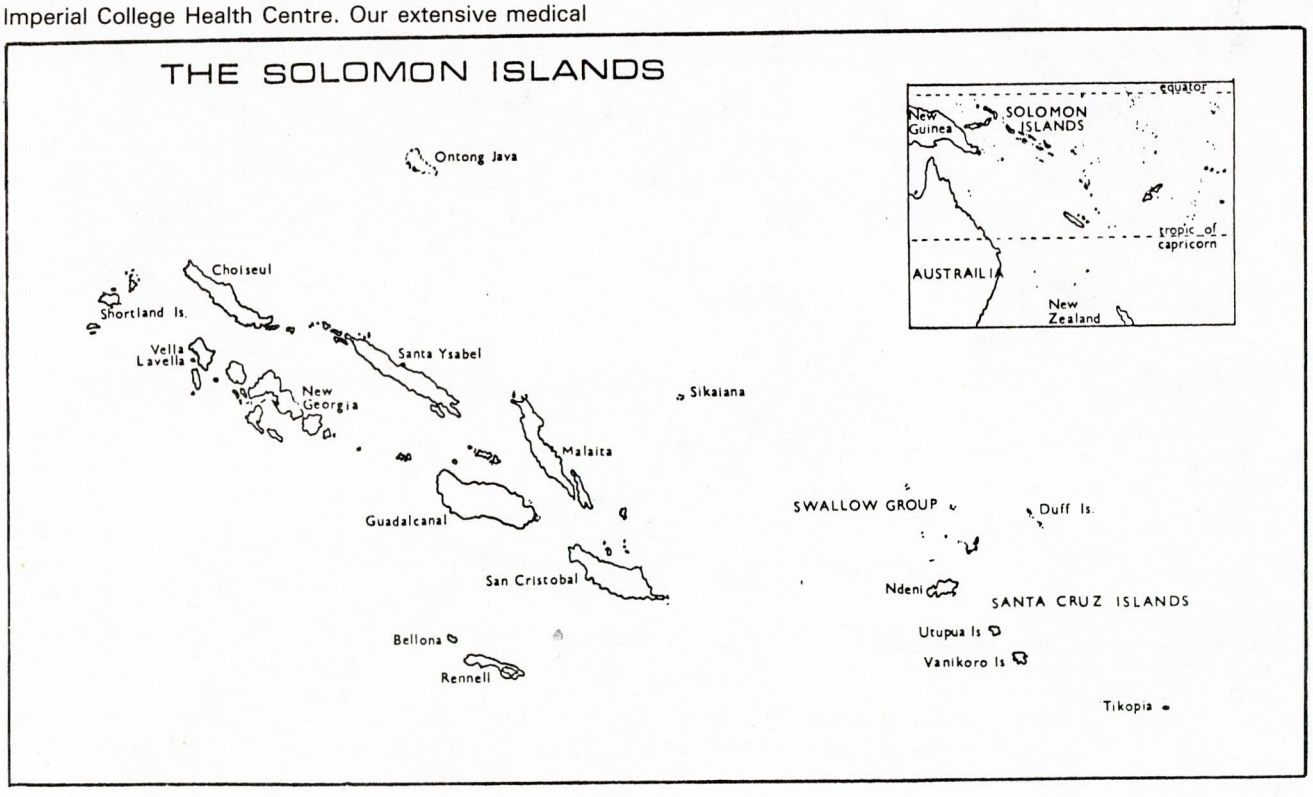
Solomon Islands 1979

John Baker
Ian Barber
William Hamilton
Heather Sargeant
Margaret Smith

Planning of the prohject began in the summer of 1978 and shortly after the group was formed. After a great deal of research and information gathering the basic aims were set out: to visit the Western Province of the Solomon Islands and document the construction methods for the widely used dugout and to try to find out and record the construction details and associated legends of the rarer and larger war canoes, previously used for headhunting.

General plans having been set out and having convinced ourselves of the feasibility of the prohject, the next stage was that of convincing other people. As none of the group had any previous experience of fund raising this stage was a very great challenge requiring all the inspiration and initiative we could muster. Typewriters were dusted off and the two fingered race for sponsorship began. As the group itself was spread geographically this involved regular meetings in London, Oxford, Cambridge, Burgess Hill, Salibury, Exmount and Sidmouth! Much was compiled by way of equipment lists and it was debateable whether more attention was paid to film care with respect to protection from heat and humidity or medical care. On the latter score we received a great deal of help, both by way of sponsorship and of technical advice from Imperial College Health Centre. Our extensive medical kit was eventually self-financing and proved to be very adequate. In all some 500 letters were written, both to industry and to charitable organisations, but as we had calculated on a budget of six thousand pounds we realised the enormity of the challenge. Of this £3,160 was required for travel to the Islands and, despite all efforts, we were unable to obtain any sponsorship towards this. This money we needed by the beginning of May and if it were not forthcoming we knew we could not succeed.

At the beginning of March we had still received no money. Although the Imperial College Exploration Board was interested in the prohject it felt that it was perhaps a little ambitious and was doubtful as to whether a scientifically based group could effectively carry out a largely anthropologically based study. However, at the second meeting, after we had produced a fairly extensive prohject brief, we finally persuaded the Board to support Imperial's interest in the expedition. Together with support from The Twenty Seven Foundation and Sherborne School we felt things were moving at last. The turning point however came with the support of the Royal Geographical Society and the British Broadcasting Corporation at the beginning of April. We were fortunate enough to receive one of the Mick Burke Awards, given each year by the BBC to self-supporting expeditions. Six of these are awarded and together with some financial support include the training and materials for a group of people to make a film documentary.

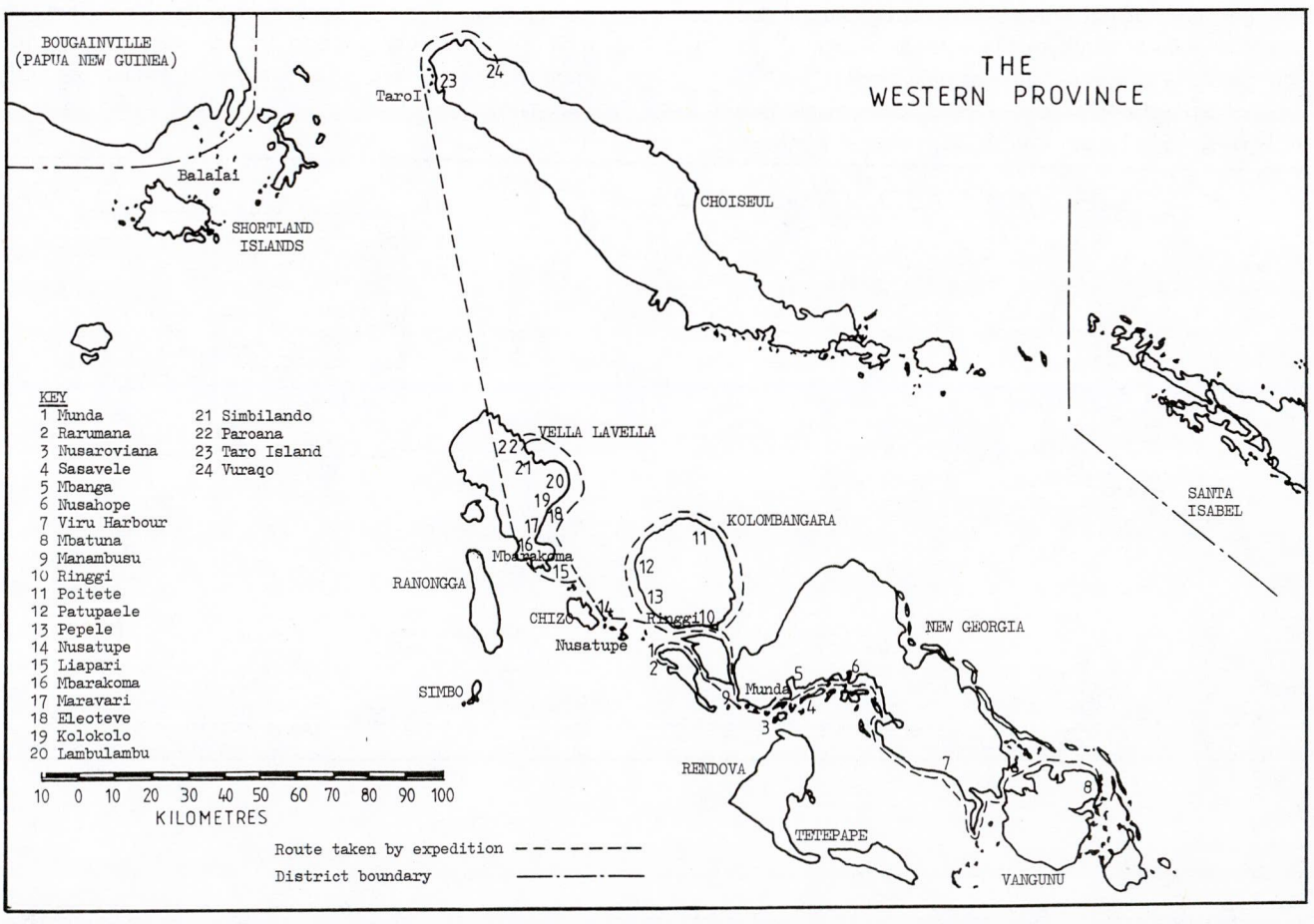


We now felt that somehow we must succeed and by the beginning of May took the plunge and purchased the tickets although this reduced our bank account to nearly zero. Finally, having begged and borrowed the necessary remaining cash, by July, with three of us having completed our final exams, we were ready for our voyage to the Pacific. Owing to the weight of our camera and other gear we had thrown out all but a bare minimum of clothes and at last reduced our packs to about 20 kg each. Our worries though were perhaps a little unfounded, as the customs officials were so engrossed in the formalities concerned with equipment and film, that they did not include these in the weighed allowance!

The flight took us via Bahrain, Singapore, Sydney, Brisbane and finally on a DC10 to Honiara. We were a little apprehensive when we reached the capital for although we'd made our initial enquiries in September 1978 we still had not received the required Government Research Permit. However we were initially given a two month visitors permit and the customs officials proved to be more interested in our light weight two-man tent than our camera equipment. Within a couple of days we had managed to sort out most things and to obtain our official documents.

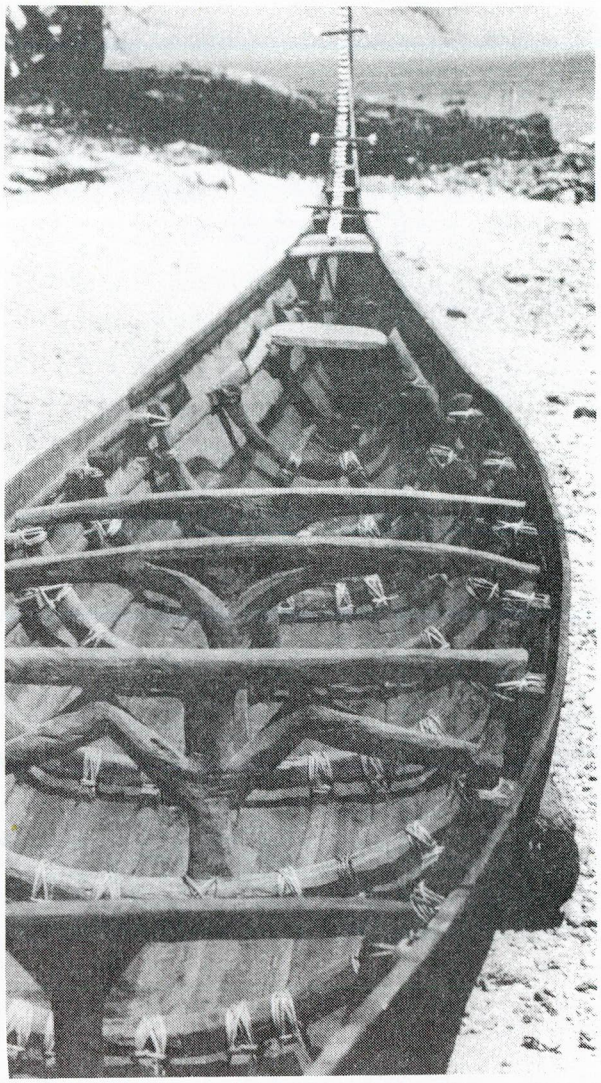
A week later we left the mission hostel where we had been staying. The 160 mile journey to Munda in the Western Province involved a twenty-four hour voyage in a small ferry, firstly across the open sea and then, thankfully, into the more quiet waters of the Marovo and Boviana lagoons. During our journey we had our first introduction to a tropical storm. It was however debateable whether this was preferable to the cockroach infested cabin which we had booked to store our luggage. The boat stopped regularly at small jetties to disgorge its colourful load of passengers and such personal belongings as bedding, bundles of sweet potatoes, dried pandanus leaves and even parrots! We finally arrived in Munda, one of the larger settlements in the area which, in addition to a jetty, boasts a one and a half mile long airstrip, built by the Americans during the war. Here we established our base with the help of contacts in the Forestry Department.

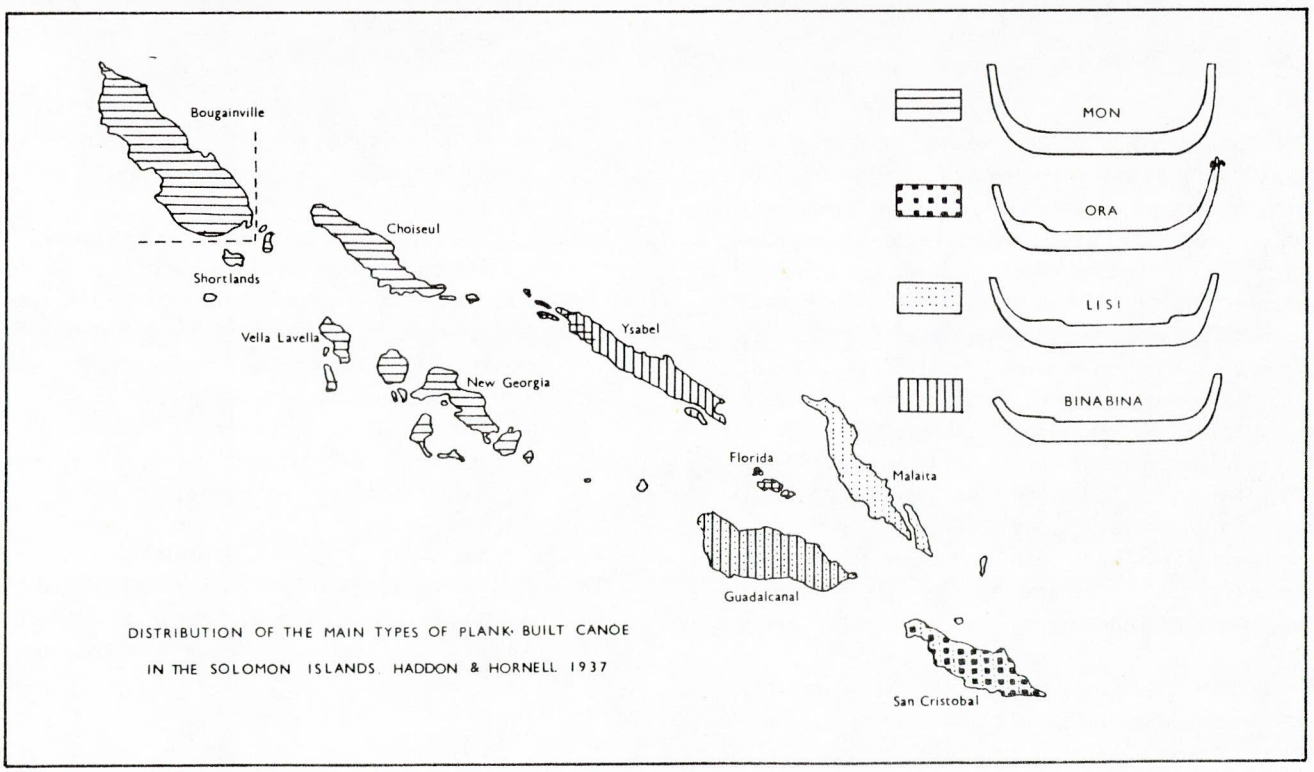
Four main types of plankbuilt canoe exist in the Islands and we based our study on the 'mon' type which is restricted largely to the Western Province. The first record of the 'mon' of the Solomon Islands is in the narratives of the Spanish Expedition under Mendana in 1568. Since then many writers have remarked on the elegance and beauty of decorations of this canoe. Previous investigations had decided that documentation of the plank arrangements of this canoe was incomplete and contradictory so their report did not include any data of this point. Our data now includes the exact mode of construction of these



canoes, from the initial choice of trees and shaping of the different strakes, through their stitching together with bushrope and caulking with 'tita' to the elaborate decorating with native dyes and shell inlay. Plankbuilt canoes such as these were used a great deal in the years up to 1902, before the arrival of Christian Missionaries which, together with other influences, put an end to the practices of headhunting and raiding which were vastly reducing many of the Island populations. Today, very few such canoes remain and the generation who knew about their construction is slowly dying out without the skills being passed on.

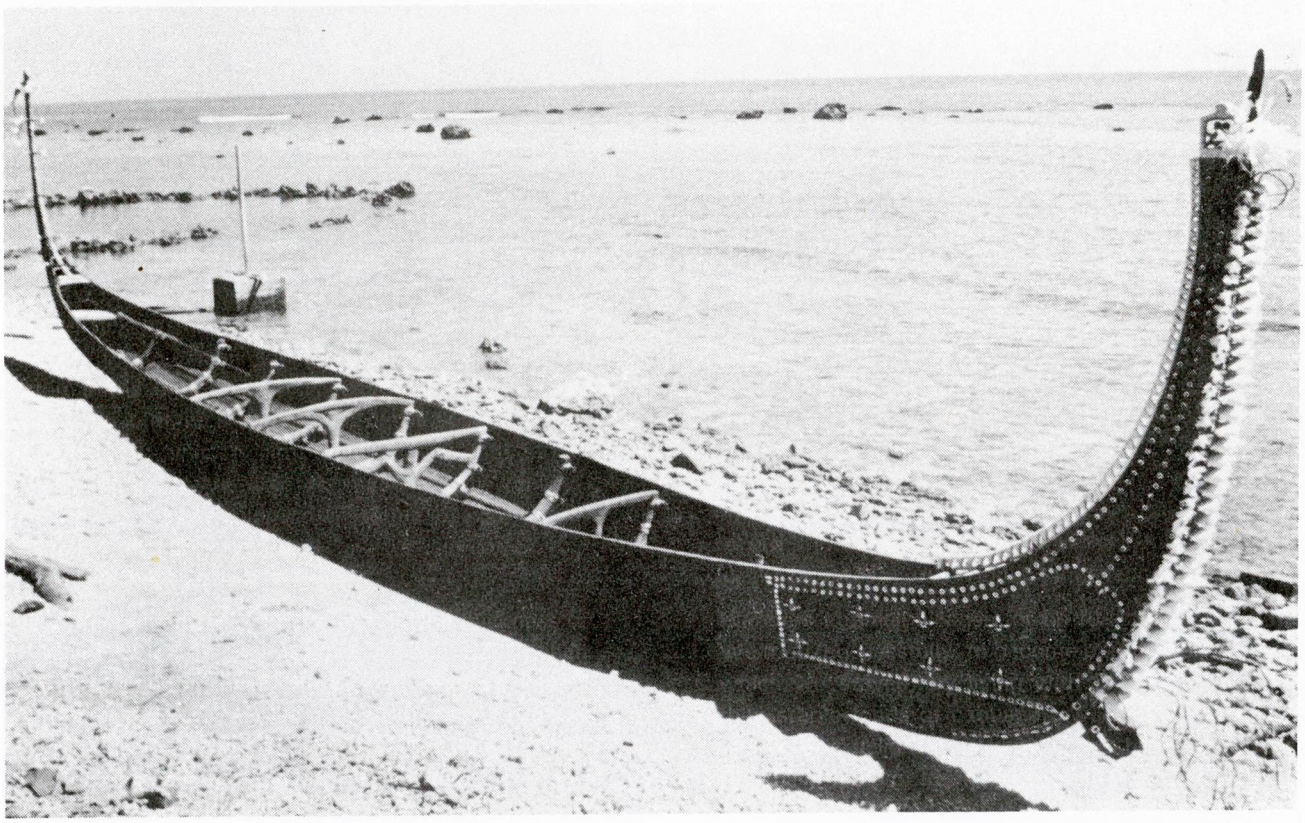
We also studied the widely used dugout canoe of the Western Province, which for the majority of Islanders is the only means of transport between villages, trade centres and even dressing stations and hospitals in times of emergency. These canoes vary considerably depending on their prospective uses and whether they are paddled predominantly in calm lagoon waters or the rougher seas off unprotected coasts. Again they require a high degree of skill in their manufacture, being built completely by eye, using no measurements. All the work is done by hand, axes and adzes being used to





DISTRIBUTION OF THE MAIN TYPES OF PLANK-BUILT CANOE IN THE SOLOMON ISLANDS. HADDON & HORNELL 1937

shape the hull and dig out the wood. The thickness of the hull, which may be graded from about half an inch at the edge to six inches at the keel, is gauged solely by feel and the changing resonance as the hull becomes thinner. The field has seen rapid change within the last twenty years. The outboard motor, introduced for the first time in the 1960's is gradually taking the place of paddling and sailing techniques among the more wealthy islanders. Power saws are also replacing axes in those areas where builders have access to them, for example near the timber companies and some mission stations, and fibreglass is also used more extensively.



In order to cover the large area of the Western Province the expedition was divided into two phases. Initially, we visited the Elders of those villages that were within walking distance of Munda or that could be reached by short canoe rides and thereby started to expand our list of contacts for all the Islands. These contacts consisted of the old men who still knew how to construct plankbuilt canoes and those younger men who had earned a reputation as dugout builders. We were also keen to talk to the chiefs of the villages who would generally prove reliable sources of the more important custom stories and rituals associated with war canoes. Conversing with the Islanders was carried out largely in Solomon Pijin, which is almost universally understood and which we were able to master fairly rapidly. Throughout the Solomons some seventy-four languages have been recorded.

Having compiled our list of contacts, the second phase involved splitting the expedition into smaller groups of two or three to travel further afield and live with the Islanders in small villages for up to a week at a time. We tried, successfully, to become part of the villages in which we stayed, by living with families and eating their staple foods of cabbage, sweet potato and taro which they delighted in showing us how to prepare. Our main mode of transport within the lagoons was by dugout canoe fitted with outboard motor but for the longer journeys the small inter-island planes proved the only reliable means of transport. We did however test out other means of transport, including cargo and copra boats and even paddle and sail dugouts, but these proved less reliable especially in rough seas, and rather nerve-racking. On one such journey we had to navigate by moonlight in very rough weather, carrying an injured child to the nearest dressing station.

In this way we were able to cover the large area of the Western Province, which one group on its own would not have been able to do. Much interesting data was gathered. Our record has been compiled from minute notes, dictaphone recordings, measurements and diagrams. Extensive use was also made of 35mm colour slide film and some large format film (6 cm by 6 cm) together with the 16mm cinefilm which was shown on the 'World About Us' on May 4th 1980.

All in all, we had spent a very enjoyable three months and were able to gather the data we had set out to record and it was with some sadness that we waited for the boat to return to Honiara and hence homeward.

Joyce Dunsheath Expedition to Turkey 1979

Roy Attwood (Leader)
Malcolm Clarke
Richard Dent
Liz Kay
Tim Luker
Helen Martin
Paul Roberts
Julian Robinson
Aidan Ryan
Nigel Snow

Ten members of Imperial College carried out an expedition during ten weeks of the summer of 1979. The purpose of our expedition to the Taurus Mountains of Southern Turkey was to explore thoroughly the caves within a day's walk of our campsite on Cimi plateau. As well as surveying the caves we planned also to study the zoological and botanical life at the cave entrances.

Cavers have been slow to recognise the potential of the large masses of limestone forming much of the Taurus Mountains. Studies of the hydrology of the region have shown that water draining the vast poljes North of the mountains travels underneath the peaks to resurge spectacularly South of the mountains as far as 80 km away. The long transit times recorded, up to one year, suggest a large body of water is stored underground. Most cavers to date have concentrated either on the area of active as well as old resurgences in the Manavgat gorge, or on the few large caves known in the North (Pinar Gozu in particular). Our plan was to look for caves high up in the centre of the mountains. Presumably water from here would percolate down to the underground reservoirs, and there was the remote possibility that we might be able to follow a route ourselves.

The idea that we concentrate on an area within a day's walk of Cimi plateau was suggested by our 'foster-club', the Bosphorous University Speleological Society (BUMAK). In the summer of 1978 BUMAK had spent a few days prospecting around the plateau and found some tantalising cave entrances which they were unable to explore because of lack of equipment. The most exciting, Dunekdibi Obrugu, was a fissure just 1m by 5m, but a stone thrown into the cave was only heard to reach the bottom after a wait of seven seconds. By teaming up with BUMAK we all hoped to be able to descend this, and even deeper caves which we might find.

Planning

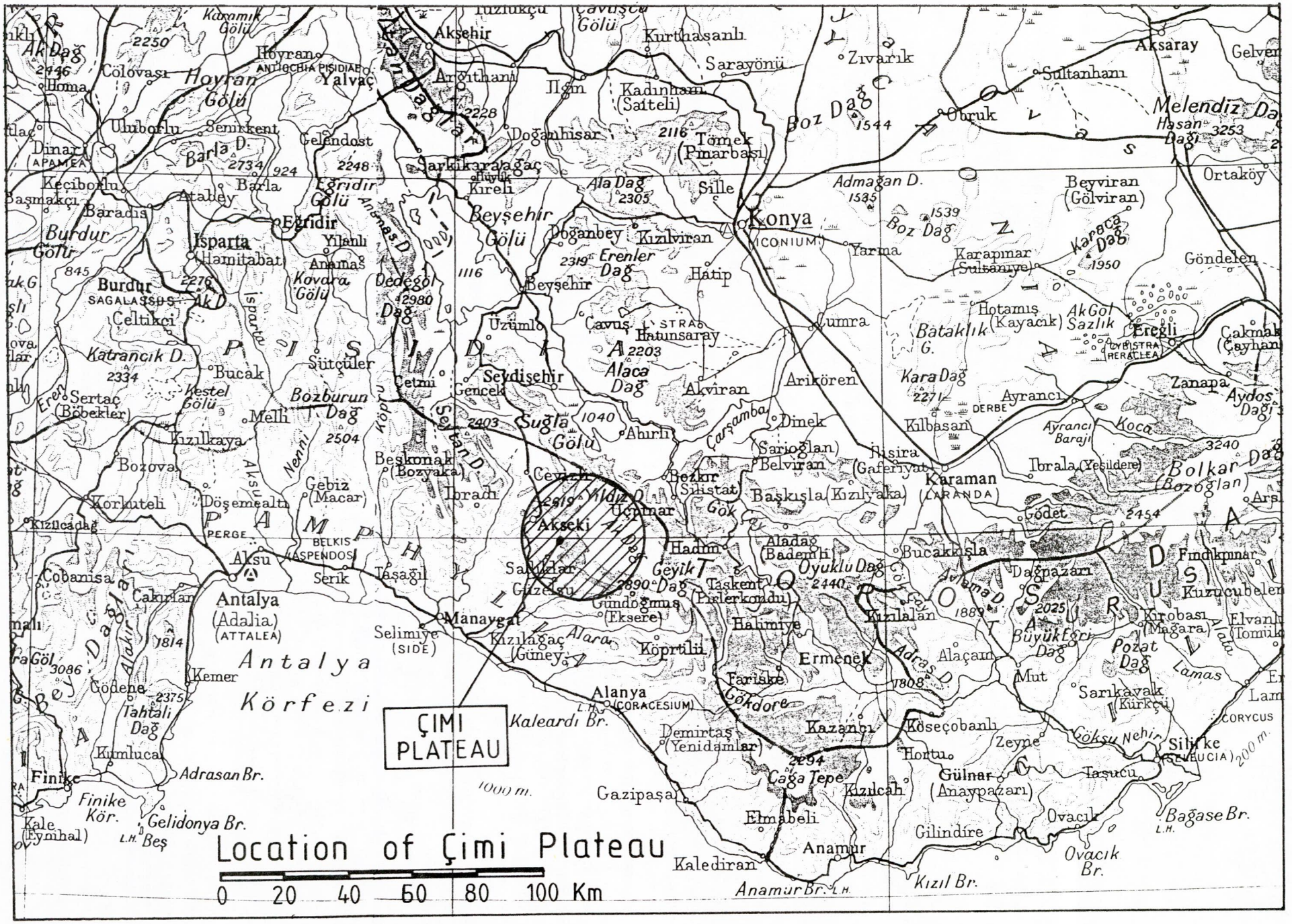
Fund raising and obtaining official permission were the two pre-occupations of the planning stage. A number of firms were generous in presenting equipment free, or at a much reduced price; but we were still very short of the funds when news arrived that we had won the Joyce Dunsheath Memorial Prize. It being the 25th anniversary of the foundation of the University of London Convocation Trust, two prizes had been offered in honour of its founder, Dr P Dunsheath, and his mountaineer wife, Joyce Dunsheath. The award put the expedition on a firm footing at last.

Official permission was more of a problem. The Turkish Embassy said none was required, but would not put this in writing. BUMAK warned us not to write to Turkey for permission as it might well be refused. They advised us to enter the country as tourists and tell the Governor of Akseki of our intentions when we arrived; the Governor was sympathetic to cavers. The scheme worked well. There was no difficulty at the border, and the Governor proved most hospitable. At least we did not suffer the fate of the intended 1971 Imperial College Expedition, which was refused entry permission at the last moment.

The Journey

After two weeks of servicing and adapting our two Land Rovers, we set off from College on July 10th. Good progress was made through to Germany, but then the short-wheelbase vehicle started to spray oil from the sump breather. Various contraptions to contain the oil were not a success, while the loss of oil and power rapidly worsened. Reluctantly we were forced to stop and strip the engine. New piston rings (posted from Britain) led to merely a temporary improvement. Finally we had to abandon the vehicle to be repatriated under AA 5-star insurance. All the essential caving gear was packed into the long-wheelbase Land Rover with two drivers, while the rest of us hitch-hiked to Istanbul. The pudding shop in Sultan Ahmet square became the reunion point a week later and BUMAK generously arranged for those of us who arrived first to stay at the University while waiting for the others to catch up. Meanwhile, there was equipment to be checked, and the minor details of the joint organisation to be worked out. We were also to witness the Turks' proficiency at baseball and frisbee. At last, leaving instructions for the two of our number still to arrive, the full expedition set off by scheduled coach for Akseki.

Cimi plateau, where we were to camp, is 15 km South-East of Akseki. A dirt road leads 5 km up to Cimi village but the way on from there is a very rough track rising steeply up the valley. We broke a half-shaft on our first attempt, and by the end of the last trip the track had claimed another half-shaft and four punctures. At 1600m the polje of Cimi plateau was



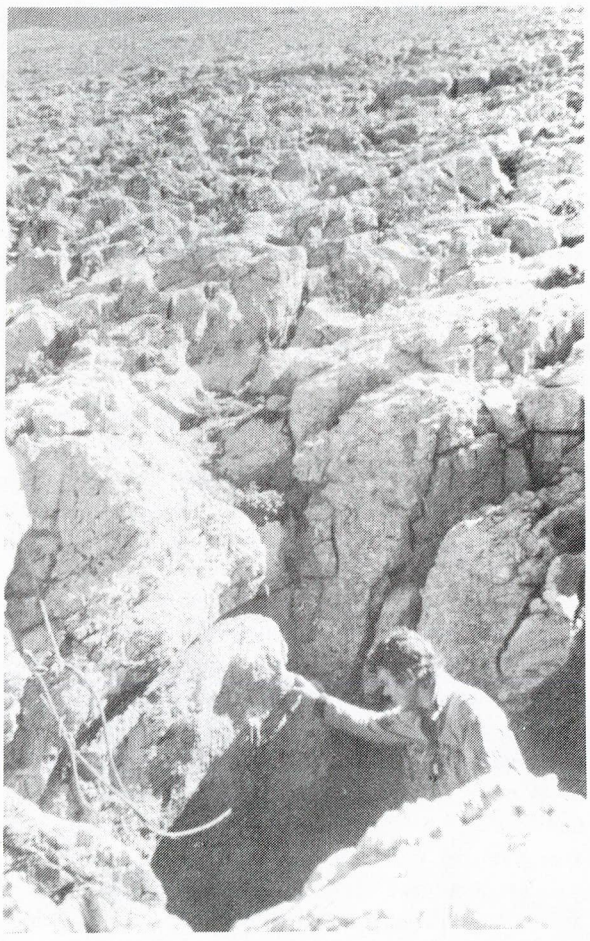
reached. The dry lake bed made a pleasant camp site. Unlike the poljes in Northern Turkey, there was little chance of it flooding at this time of year.

The Caves

The cave we all wanted to see first was Dunekdibi Obrugu. Sure enough, a stone took fully seven seconds to reach the bottom; we took a week – being almost over-cautious as none of us had tackled such a big pitch before. The entrance fissure opened into a shaft roughly elliptical in section, 7m x 4m, and continuing like this to the floor 192m below, with only one small shelf 136m down. A small stream trickled into a tight fissure but we were disappointed in not finding any way on that we could follow.

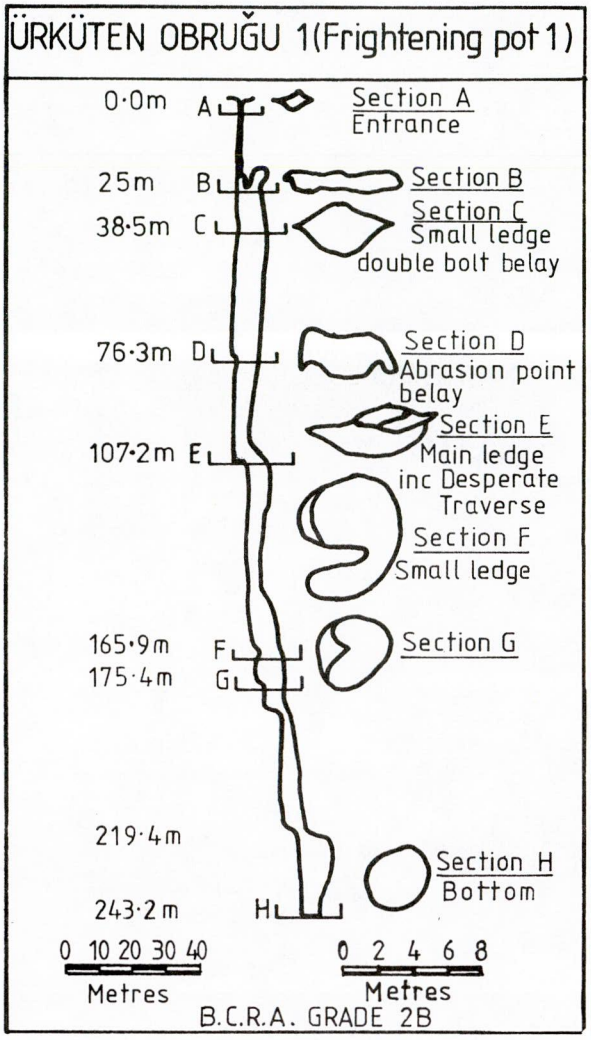
Meanwhile the prospecting parties had discovered a number of other entrances close to the camp. One of the local shepherds had shown us an entrance only 1m across which he termed Urkuten Obrugu (Frightening Pot) and produced 24 seconds of rumblings when tempted by a dropped stone. Next day we returned with ropes and tackle, but couldn't even find the entrance, and had to ask to be shown again! Many mornings of toil up to the cave followed, placing more bolts and exploring new pitches until the bottom was reached 243m down. According to BUMAK's records the cave is the fourth deepest known in the country.

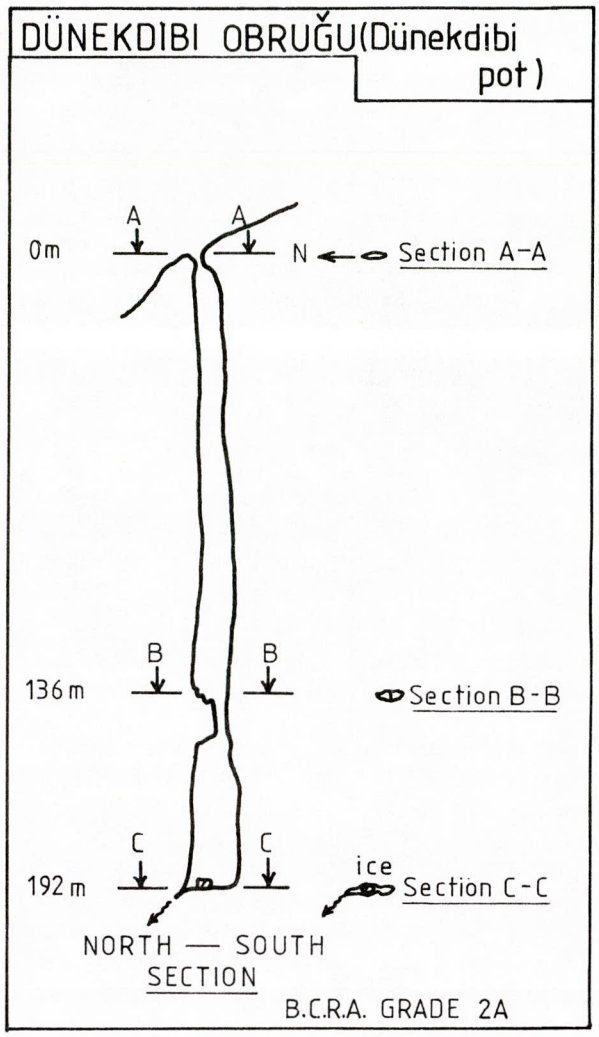
While the major caves were being explored, 'reserve' parties were investigating many smaller caves nearer camp. Typically a small entrance opened into a wider shaft, say 35m deep, with smooth sides, sometimes with ledges. If there was any way off at the bottom it was only a narrow fissure and could not be followed. The floor would be a flat bed of small boulders, but where the entrance was large enough to allow much to



blow in, the shaft was floored with about 3m of compacted snow.

The Turkish cavers had only planned to be away for three weeks, and wanted a few days on the coast before heading back to Istanbul. We too found the idea





of basking in the Mediterranean irresistible, so packed up the camp and set off for the beach. Swimming was not the only attraction, for the whole of Turkey is littered with archaeological sites – stubbing one's toe against a fallen Roman column is a continuing hazard! Toes bandaged, sunburnt and mosquito bitten all over, we returned to the coolness of Cimi plateau a few days later.

With renewed vigour, Aidan and Richard set off to look for entrances further afield in the valley to the South-East of the plateau. The family with whom they stayed made them so welcome that they did not get much further, but returned having been shown six new entrances near the settlement, and with promises of many more further on. We had plenty to do in the next few weeks. The most spectacular cave of the expedition was one of those near the village. Golcuk Obrugu 1 was entered by a squeeze into a rift. Sixty-five metres down, the rift broke into a chamber 20m square, partially filled with a cone of ice emanating from a shaft at the far side. It is not often that the Mediterranean caver feels the need for crampons! We made do cutting steps up the ice to reach the shaft, but the gap between the ice and the rock was too narrow to allow us to climb up. Perhaps some work with an ice axe would have provided a novel 'through-trip' – we can only guess. Certainly there is plenty of scope for further exploration around Golcuk Obrugu 1 and 2 and beyond. The small polje, Golcukur yaylasi, beyond Katirciini, would provide a fine campsite for a future expedition.

Survey

The most detailed map we could obtain of the area was traced from the 1:250,000 series held by the Royal Geographical Society. Early on we resigned ourselves to making our own map, and accordingly took along a theodolite and drawing instruments. A base line was measured across the plateau and eight primary survey stations established at the major surrounding peaks by triangulation. Additional detail, and the position of each cave was then added by the intersection of bearings taken with a sighting compass. Interestingly, magnetic North was about seven degrees East of true North (in Britain the deviation is the reverse), causing much confusion early on.

The caves we intended to survey by compass and tape, to the standard of BCRA Grade 5. In practice, this proved far too ambitious, and to little purpose. The deep vertical pitches were measured by laying out the rope after de-rigging, and adding 2% for stretch under the weight of the rope itself ('Blue Water II'). The last person out tied knots to indicate the bottom of the

pitch, and the length of slack at each bolt on the way up. Inside the cave dimensioned sketches were made of the passage detail at useful points, and magnetic bearings recorded. The results were drawn up to scale, usually the same day, and a brief description of the cave written while it was still fresh in our minds.

Botany and Zoology

The intended study of life at the interesting transition zone at the entrances to caves was largely frustrated by the danger of working in vertical caves and also the lack of habitat. The shafts provided an abrupt change from surface to cave, while the high altitude combined with serious over-grazing (by goats) led to a sparse vegetation. It was interesting to note how only the spiny or unpalatable shrubs survived. Sirlavik Obrugu was the only cave to have a damp entrance. A number of mosses were collected here, and the specimen of the algae fritschiella tuberosa has found a place in the collection of the British Museum.

No cave-dwelling fauna was discovered, save some diptera larvae making the most of a goat skull at the bottom of Kizlar Magarasi. Accordingly Liz turned her attentions to other things. A detailed study was made of the Insecta on Euphorbiaceae sp., and a random distribution of yellow tray traps scattered around the plateau yielded some interesting results.

Return

Overall, the expedition achieved its aim of exploring the area around Cimi plateau, though we were disappointed in not finding any active systems. Not only did this detract from the biological programme envisaged, but it meant that the finds are of little more than sporting interest, since they only help to clarify the underlying hydrology in a negative sense. From a more personal point of view, the expedition provided a valuable insight into the Eastern way of life, and showed us an interesting contrast between our Turkish caving colleagues from the University and their compatriots living off the land in the South. From both, there remains a lasting impression of generous hospitality.

Lake Chad 1980

Jane Bingham
Helen Brown
Philip Crawford-Smith
Caroline Fitzpatrick
Scarlette Gray
Sandra O'Sullivan
Simon Perry
Andrew Pullen
James Storr
Laura Suzani
Jonathan Tame
Elizabeth Walter

The Lake That Wasn't There

It was quiet; it was dark; dusty and cool as I sat, perched like an idiot, on a pile of rocks watching the moonlight dissolve into the horizon and drinking my gritty coffee.

I still find it surprising how swiftly events have passed, and yet the routine enforced by travelling quickly overland seemed to have been with us all our lives. Home, with all its luxury and complexity, was a long way away.

I could remember, months before, drinking tea, in the days before I learned to love coffee, listening to English voices on the radio and poring eagerly over the maps, drawing lines with our fingers with a strange sort of flippancy, and chattering excitedly about the things that we would see. The last three days before we left were breathless in contrast, people dashing about clutching lists, a peculiar amount of organisation resulting from the apparent confusion. Unbelievably we left on time, on 3rd July, exuberant and squashed, twelve bodies distributed amongst two Land Rovers, along with the tents, cameras, glassware and soya mince.

We hurried through France and Spain, taking in a cross-section of the countryside in six days, as we watched the towns and villages give way to mountains as we detoured through Andorra, delighting in the duty frees.

The first piece of Africa we experienced was at Ceuta. There followed the first of many hot, sticky delays at the borders as police insisted on exploring our packing system and embarrassing everybody with the contents of their sponge bags. Many a figure of towering masculinity had their matching baby lotion and talc revealed to the world. Finally, after glaring at us and confiscating our walkie-talkies, we were allowed into Morocco.

Full of exploration spirit, we set off along the open road for two whole minutes until our beloved leader drove through what he insisted were concealed red lights. The police, however, were no longer concealed, but our leader, with amazing charm and pretence of stupidity, which was to prove invaluable on many subsequent occasions, was let off with a warning. We were on our way at last.

We were soon to discover that you are never alone in Morocco. As soon as we had driven off the road to some wild, secluded, untrodden spot, to make camp, the bushes would come alive with children of various sizes, who would settle down to watch, wide-eyed, our every move. They would slip away at dusk, just in time for the innumerable toads to begin their night long serenade, comparable in volume to being under the flight path of Luton Airport. Finally, the toads would cease and we would wake, to find that we were camped on what would appear to be a major throughway for laden donkeys and women, who would weave their way through the camp beds trying not to stare.

After a short stay at Fez to see how many camels we were all worth, we camped one last night in Morocco, attempting to cower behind the Land Rovers out of a very strong wind, watched over by one or two shepherds. With much form-filling and waiting, we crossed into Algeria, travelling through the foothills of the Atlas Mountains. The next day we took a short cut to reach the only reasonable road to Tamanrasset and the desert, and quickly became lost. This did not necessarily appeal to everybody's sense of excitement, but after an hour or so of guessing which track to take, and which villager to believe, we found the road, and began the desert crossing.

The desert cannot be treated with indifference: it is either appreciated with enthusiasm, or loathed as an inhospitable wasteland. For me, the colour and the beauty, of an unearthliness which seems to encompass a world all of its own, shall never be forgotten.

Passing through the impeccable, blue-painted Islamic towns of Ghardaia and El Goles, we stopped in cool, empty hotels for extortionate drinks and postcards home before moving on. However the most luxurious of these breaks in our journey was at an artesian spring, where we showered in the warm water that came gushing out of a pipe, and did our washing with the lorry drivers. That night we camped in scenery that was almost Martian, with reddish sand speckled with white rocks like fragments of bone, discovering also that the desert does not really get that cold at night. The hottest part of the journey, however, was the four hundred miles across a plateau and through a small town called Ain Salah. The land was perfectly flat, and after a while a tarmac-like stretch of a few hundred miles changes to yellow with black rocks. Pieces of

horizon seem to become mixed up in the sky, and eventually we appeared to be driving in a massive sheet of water as all the mirages joined together in the heat. Ain Salah itself was very quiet at one o'clock in the afternoon and, as most of us were still quite hungry, we had lunch under the only trees that the town possessed. We must have seemed a strange sight, draped in dripping towels soaked in salt water from the petrol station, because a bored-looking policeman moved us on, even though the place was deserted.

The last stretch of road to Tamanrasset will remain everyone's favourite, and we arrived at the town with all the packing and some of the passengers rearranged by large potholes every three feet along the so-called road. Still, there was plenty of time to repack, as we had to obtain water and exit stamps, both time-consuming exercises.

After Tamanrasset, we were treated to corrugations on the road, which left us shaken and un able to stir, at least until after sunset. The Land Rovers were never the same again, the doors having developed a tendency to open at inconvenient times. Eventually we reached the Niger border, which gave us the opportunity to meet fellow travellers. As we surveyed their sleek, air-conditioned Land Rovers (complete with stereo and fridge and doors that closed properly to keep the nasty sand off their carpets), we decided that it was such a shame that they were not experiencing the desert properly, like we were. When we tried to explain this to them, they did not seem to understand.

There seemed to be a custom in Niger which required travellers to stop at every town for the police to pretend to search the Land Rovers, and to write all over everyone's passports. The thrill of having a passport filled with exciting, foreign-looking stamps soon evaporated in the heat, but the police seemed genuinely pleased to see us, as if our presence added a little excitement to their day. Looking stern and efficient, they would search the bag at the top of the pile, then, after surveying the eleven others, would allow us to go on our way.

As if we needed a change from the desert, a thunderstorm seemed to follow us as we travelled through scenery that was most spectacular, in that it was green. Most of the land was used for grazing, and so appeared totally uninhabited except for the huge, unidentified cattle, which were very easy to nearly collide with owing to their reluctance to share the road. The villages became entirely composed of straw huts, just like the ones of the Tarzan films, and we soon began to feel that this was just like proper exploring.

Our spirits however became a little dampened when the thunderstorm would catch up with us every night when we had stopped to camp, but had not had quite enough time to finish putting the tents up. After a few playful puffs to ensure that any tent-like efforts were annihilated, we would be treated to an astounding exhibition of what a real thunderstorm should be like, and then sent scurrying to the Land Rovers from the rain, to spend the night squashed up and steaming.

During our stop in Zinder, we were, to my delight, beleaguered with pedlars and their handbags, wallets and cushion covers made of camel, snake, or at the very least, of Tuareg design, and various bangles of Agadez silver. It was here that I developed an insatiable passion for haggling, much to the annoyance of the rest of the expedition, as I would even continue transactions as we were trying to drive away.

Past Zinder, the storm must have overtaken us, as the nights were dry and the days somewhat wetter, wading in after the Land Rover which would splutter to a halt every time water seeped into the distributor. Sometimes, curious fellow track-users could be persuaded to dismount their camels and push, but usually the Land Rover could be coaxed into life. Apart from these short delays, driving in water was good fun. Eventually, on 22nd July, we reached N'guigmi, on the shores of the lake, and began to look both for fuel and the lake itself. We had arrived, but if the lake itself had receded as we suspected, we would not have enough fuel to reach it. To the rescue came a Frenchman in his shiny Range Rover, who led us to his oil camp not far from the town. Here we were treated to the comparative heaven of cold fruit juice in an air-conditioned hut, the last thing we had expected at the end of our journey. Later, we were given fuel and introduced to the local doctor and generally knowledgeable person, and we waited impatiently outside in the heat, taking pictures of the inevitable crowds of children while intensive talks and translations took place inside. We soon discovered that the lake had receded beyond the borders of Niger, and into Chad.

Somewhat depressed, we thanked our advisor, who had generously offered to be our guide, and slunk back to the oil camp. We were aware, and had been emphatically reminded by our guide, that going to Chad would involve a distinct probability of being shot. We rapidly came to the conclusion that some of the projects would have to go. The rest of the day, our guide took us on a tour of the islands, or at least, what would have been islands, if there had been any lake. The most notable character that we met was a fisherman, who stood proudly, arms folded, whilst our guide explained that he was waiting for the lake to return. We all walked on the bed of the lake, collecting fish bones and commenting wistfully on the bilharzia that we would not be able to catch after all. After a day at the oil camp, tightening up the bolts on the doors, which were, by now, dropping off the Land Rovers, we began the five thousand mile journey back.

The return journey was to prove as eventful as the outward journey, with occasional arguments with officials and amongst ourselves as we retraced our route to Tamanrasset. It was then that we took another track which passed through the Hoggar. The Hoggar has a magic all of its own. No vegetation grew there, yet it was the most colourful of places. Mountains like giant teeth stuck out of the rocks, emblazoned with mineral deposits of pink, purple and green, one of those places which inspires people to sit on rocks like idiots for hours on end. Time was growing short, so with a ferry to catch at Tunis we left the Hoggar and went back towards the coast through Ain Salah. We arrived there in the late afternoon, so as not to become cooked as in our outward journey – but instead found ourselves in the middle of a real sandstorm, which held its own excitement and fascination, provided it was watched from inside the Land Rover.

Finally we reached Tunis, and were let loose for a day amongst the cold beer and ice creams while we waited for the ferry. Our last night in Africa was spent huddled in a car park by the sea with fellow ferry passengers, waiting to join the queue at 6:00 in the morning. After the ferry, we drove swiftly through Sicily and Italy, trying desperately to fulfil the insatiable appetite we had developed for ice creams, which was only finally cured by crossing the Alps into a rather cold, soggy France. By 14th August we were home, and dashing to the nearest fish and chip shop in Ramsgate.

This article by Sandra O'Sullivan first appeared in ICON No. 22 February 1981.

Newfoundland Expedition 1980

Lesley Brown
Jeremy Holland
Steve Leinster (Leader)
Craig Mallery
John Nolan

After a Royal College of Science Natural History Society lecture given by David Partridge about the Imperial College expedition to Lapland in the Summer of 1979, the germ of an idea for a further biological expedition began to grow. Within a week, it was decided to work on lichen ecology in South Eastern Newfoundland, in an area called the Analon Peninsula during the summer of 1980. This particular location was chosen because of the very rich lichen flora of the area and the fact that it has been understudied with respect to lichen ecology. The members of the expedition party were all to be Botany second year undergraduates.

Our proposals were brought before the Imperial College Exploration Board in March 1980 who decided to give us their backing and support us financially with a donation of £800. With this official recognition, we were able to approach other award giving bodies, for example, The Royal Geographical Society. In total, we had to raise £2,500 which we managed after our personal contributions of £150 per person and a further £200 from the Exploration Board.

The period before departure comprised a great deal of administrative work which was necessary to ensure the smooth running of the expedition. Included in this were many hours of letter writing trying to persuade learned institutions, firms and grant awarding bodies that our expedition was more deserving than any other expedition planned for this year. There were, of course, many other things to be done – for example, the equipment necessary for living under canvas for several weeks had to be acquired. We were very fortunate in this respect in that most of our camping equipment was provided by the Exploration Board. Extra equipment which was needed we were able to buy from various firms at generous discounts.

Certain difficulties were experienced with travelling arrangements. This was due to the rather unexpected behaviour of Air Canada who changed their timetables three times in two months, causing us to alter the timing of the expedition, meaning that we had to leave for Canada two weeks earlier than anticipated and arrive back in England earlier than planned as a consequence. In addition to this, the return fare was increased by £74 which meant that we faced an increase of £370 in an already stretched budget.

By late May, everything was organised, the freight dispatched and nothing left to do but wait. In early July, the money needed for the actual trip was collected and the team made their own arrangements to ensure that all of us were fully prepared to take part in the expedition.

July – September

On July 16th three members of the expedition flew to St. John's, Newfoundland, arriving at 19.00 hours local time. We were accommodated at the Memorial University of Newfoundland in St. John's from where we were able to obtain the freight and make the necessary arrangements for air transfer to the project site.

In all of these tasks, we found everyone to be most helpful, very friendly and extremely efficient. Our contacts in the Canadian Forestry Service, Mr Bill Meades and Mr George Mills were more than helpful providing us with information about local conditions and invaluable practical assistance. It was George Mills who took us and our freight out to the Salmonier Nature Park, the area where we were to do our work. The staff at the park were extremely gracious in their welcome, offering us all the help that we might need.

We finally set up camp about 600m outside the park boundary; the moving of the freight to the campsite would have been a real problem apart from the help of the students who were working at the park for the summer, not forgetting Mr J Pratt, the Chief Interpreter and botanist, who did more than anyone else to help us in this matter.

During the first few days at the project, site relations with the park staff developed and we were offered full use of all their facilities. Also in the first week, the campsite was set up, and we settled down to life under canvas, trying our best to get used to eating the freeze-dried food. The other two members of the expedition team arrived on the 23rd July, John Nolan and Lesley Brown and they were given a few days to settle down before we started work.

Unfortunately during this time, a problem arose; Jeremy Holland fell ill and it was decided that he should return home. George Mills and Bill Meades drove up to see us at the Park Office on the Friday morning and volunteered to take Jeremy to Gander Airport, a round trip of some 400 miles. A small student group is inherently vulnerable in this sort of situation and we are greatly indebted to them for their kindness. Apart from this problem, the rest of the expedition passed without any further difficulties and the work was carried out on schedule exactly as planned.

The purpose of the scientific work was to evaluate a

theory proposed by Dr F Rose of King's College, that a correlation exists between the number of lichen species present and the degree of ecological continuity of a stand of trees. His own work was carried out on oakwoods in Britain and was shown to be valid in that environment; we wished to carry out a similar study on conifers in north eastern America to see whether it was still valid there.

To carry out the work we planned to collect lichens from four stands of conifer of varying age. The exact age of the stands was checked with the Park authorities and were given as 10 years, 25 years, 40 years, 70 years. In each case, the lichens were collected from a 30 x 30 metre area.

Each stand was worked on for 1 week, the first 3 days of which were spent actually collecting the lichens, thus making sure that we collected as many lichens as possible. The lichens we found were very varied. The largest lichen we found was almost 15 cm across, while the smallest was just a few spots on the bark of a tree. The remaining four days were spent in the Park Office, where we dried the lichens, and attempted to identify the specimens that we had collected. This proved to be very difficult because lichens are extremely variable, the same species might look very different when two specimens of it are examined, however we did try our best! As the identification was inevitably rather uncertain, it was necessary to have all the specimens checked by Mr P W James of the British Museum (Natural History) , without whose invaluable assistance the work could easily have foundered.

By the end of August we had completed our collections and we were left with about 10 days in which to strike camp and prepare for our return to England. During this period, we went into St John's, to arrange for the freight to be sent back, and also to clear up certain points with the Customs Authority. Refreshed by this brief respite, we returned to the Park where we moved into one of the park buildings, to enable us to pack all our equipment without further delay.

On Tuesday 2nd September, George Mills came to the Salmonier Nature Park to take us and our freight into St John's. It had been arranged that he should look after the freight until it was collected, which should have been on 9th September.

We left St John's on Wednesday 3rd September and, after an uneventful flight home, we arrived on the morning of Thursday 4th September. No problems were encountered whilst clearing the lichens through Customs and so on that Thursday morning the expedition party split up to go their separate ways.

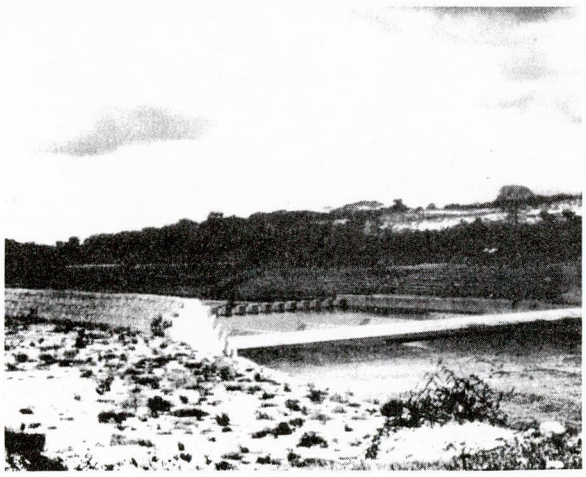
Subsequently the lichens have been positively identified, leaving only the analysis of the data to complete our scientific study. Unfortunately, a few problems were encountered with the return of the freight. It finally arrived back at College after months of delay during which time it had visited a number of foreign ports on unscheduled stops – so much for planning!

Kenya Hydrological Survey 1981

Mark Bonasiak
Niall Craig
Becky Davies
Jenny Egdell
Glenn Harris (Leader)
Nick Jones
Anne Sullivan

As the expedition gathered together at Heathrow Airport on 23rd July 1981, our worrying increased from its normal tickover panic level, to verging on the hysterical! Would the flight already confirmed three times be there (sorry, that flight was yesterday....)? Would our magic box containing current meter, wires and batteries be construed a bomb and cause us all to be arrested as terrorists? More seriously, would it be the same Kenya four of us had left two years before, after a year of voluntary service?

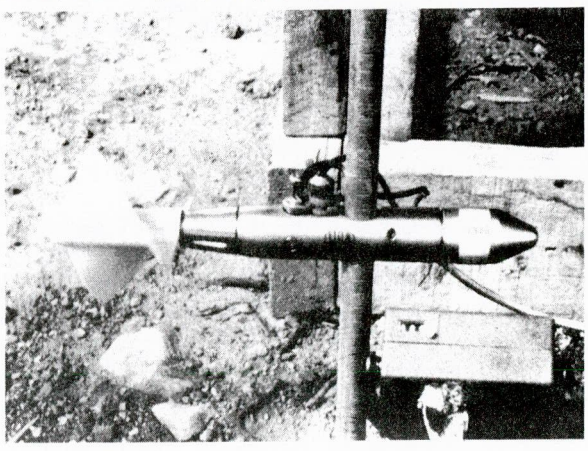
Our intention was to undertake two projects; a public health survey of a rural area on the coast and a hydrological project concerning the new Mombasa and coast water supply (a pipeline from the Sabaki river to Mombasa). The former would involve infiltrating local communities previously known to the ex-volunteers and gathering as much information about water use and sanitation as possible. This information could then be used to extrapolate the effect of the new coastal water supply on the lives of the rural people. The latter was intended to be a calibration of the weir where the water is taken from the Sabaki river for the new supply. The construction of the new supply was due to be finished during our stay.



The group was a very mixed bunch of undergraduates. Four civil engineers from Imperial College – Jenny Egdell, Mark Bonasiak, Nick Jones and Glenn Harris, and three others, Anne Sullivan (Philosophy – Durham University), Niall Craig (Social Studies – Teeside Poly) and Becky Davies (Teacher – Bristol Poly). A question often asked (usually with raised eyebrows) was what were a Teacher, Social Scientist and Philosopher doing on an engineering expedition? There were two main reasons. Firstly, all were ex-Kenya volunteers and so knew the country well. This would help with the practicalities of living and access to the rural areas. Secondly, the public health survey was not a well posed scientific exercise. The main objective was to determine how and with what reliability information could be collected – an aim which would benefit from the multi-disciplinary talents of the group.

Most of the first week was spent in Nairobi, preparing to start work and visiting various Ministries to obtain the permission required to perform our projects. We also visited the office of the consulting engineers on the pipeline project, Scott, Wilson, Kirkpatrick and Partners. They proved to be our most useful contact (cultivated in the UK through the Exploration Board) and indeed our saviour on occasions. Our first meeting with them was somewhat embarrassing though, as it turned out that the weir we intended to calibrate was dry – at that time, due to an industrial dispute, the river that was supposed to go over it went around it! I was saved from jumping from the consultants' 10th floor office by their suggestion that instead we considered performing a loss rating assessment of the same river, between the weir and Malindi. This involved finding out how much the river has leaked between these two points. The project was similar to the one initially considered, involving metering the river and using the same equipment we had brought. In reality, it turned out to be a much more interesting project and of more direct use to the Ministry of Water Development and the consultants (they have incorporated some of our results in current design calculations) than our original plans.

The Ministries we had to deal with posed us many more problems than would have been expected. They were not obstructive, it was just that access to relevant officials was difficult and we could not get decisions until we discovered the negotiating talents of the blonde-haired, green-eyed female member of our expedition. That produced a practically brand new current meter for us to use for five weeks, and a licence to do practically anything we pleased!



From Nairobi we headed for the coast hitch-hiking, the cheapest easiest and safest way to travel in Kenya. On the coast, we established a base, a small rented house 30 km north of Mombasa which, on the basis of Jenny's talents, we procured at half price.

At this point, the party split into two groups; those concerned with the hydrology and those concerned with the public health survey. The hydrologists worked from Malindi (staying at the Youth Hostel) travelling to the river every day in a Land Rover provided by the consultants. The public health surveyors stayed at the house if study areas were close by, or actually in the villages if it was far. The group personnel were rotated so that all had a go at everything. Everybody would rendez-vous at the house at weekends to discuss the work so far completed, and any problems encountered. Both projects attempted were enormously successful and enjoyable, and once work had started, no major mishaps or illnesses were encountered.

After all the work was completed the party split up to see a bit of the country before the journey home. We regrouped in Nairobi a few days before our flight was due to leave, to give us time to thank our contacts for their help and tie up any loose ends.

All concerned agreed that they had enjoyed the expedition tremendously, and that much useful experience had been gained. Much of the research performed will provide a useful springboard for future careers, and staying and working in a foreign country has taken some of the mystique out of 'working abroad'. Most importantly of all, we were able to make friends with people from a very different world to our own and we learnt a tremendous lot from them and about them.

Oman Geological Expedition 1981

Jo Armitage
Hilary Attenborough

Henry Curwen
Dave First
Guy Loftus
Gary Nichols (Leader)
Nonie Ray
John Simpson

The purpose of this expedition was to undertake a series of research projects on aspects of the geology of the Oman Mountains in southeast Arabia. The planning of the expedition, the fieldwork and subsequent research was carried out by six geology graduates, a mechanical engineer and an electrical engineer. Transport was by means of two long wheel base Land Rovers which were driven across Europe and Arabia in December 1980 carrying all the personnel, supplies and equipment. Ten weeks were spent in Oman. The return journey was completed in March 1981.

The geological projects completed include studies of:

1) Chromite ore bodies

2) Dyke swarms in the Oman ophiolite

3) A metamorphic sheet at the base of the ophiolite

4) The structural relationships between the Limestone Exotics and the underlying sediments and volcanics

5) The sedimentology of interbedded cherts and limestones

6) An analysis of wadi sediments.

The planning of the expedition really began in May 1979 when the two founding members, Gary and Guy, organised a series of meetings attended by students interested in the idea of a geological expedition to Oman. When the nature of the enterprise became clearer the essential post of mechanic was advertised and filled. Only weeks before departure, there was a change in personnel when two geologists dropped out and Hilary joined the group at very short notice; at this time Gary took over as leader because Guy was stricken with a brief but severe bout of glandular fever.

The incredible scope for geological research by a student expedition was realised when members attended a colloquium on Oman in June 1979. The speakers provided plenty of inspiration and information and very soon afterwards an outline plan was sent to the Ministry of Petroleum and Minerals in Oman. Once an encouraging reply had been received and the backing of Imperial College Exploration Board given in the autumn of 1979, the expedition became a viable enterprise.

However, it was not until September 1980 that approval of our detailed proposals was given by the Oman Government. By that time investigations into freight costs, air fares and sea passages had shown that the most economical method of transport was to travel overland with all the necessary supplies and equipment. Two Land Rovers were bought and the ensuing weeks spent preparing them for the trip.
International Third Party Vehicle Insurance (Green Card) was needed for travel as far as Turkey. For Syria and Jordan transit visas were required; these were easily obtained from embassies in London. Obtaining transit visas for Saudi Arabia was not so straightforward: the British Foreign Office kindly submitted the applications on our behalf but the issue of visas took several weeks longer than we had anticipated. The four weeks of waiting in November 1980 were depressing and frustrating for all of us! There was always the very real possibility that we might be refused visas and all our planning would have been wasted. The extra time was however useful for final modifications to the vehicles and more detailed preparations.

The Journey to Oman

December is perhaps not the best month of the year to travel overland across Europe and Turkey, especially in draughty Land Rovers, but we were lucky to have fine weather, albeit very cold (-10 deg C) in the Alps. To our surprise it snowed in Syria and Jordan, but as we crossed Arabia conditions became considerably warmer until we basked under hot sun in the Persian Gulf.

Bearing in mind that road accidents pose a greater threat to overland expeditions than any other type of mishap, we took it easy on the roads. Through Europe we drove from dawn to early evening, stopping frequently to change drivers, and staying at Youth Hostels or cheap hotels overnight. In Turkey and Arabia, we only travelled during daylight hours: there are too many hazards on the roads – camels, pot-holes and people – to drive at night. In Saudi Arabia and the Gulf States it was warm enough to sleep out under the stars.

There is a tarmac road all the way to Muscat, generally of good quality through Europe and Arabia but can be uneven and pot-holed in parts of Yugoslavia, Turkey and Jordan. The construction of many new roads along

the route is an encouraging sign for the future but in the meantime the situation is often confusing; along one stretch in Syria there were three carriageways to choose from, two of which carried traffic in both directions! Some of the roads marked on our maps didn't seem to exist at all whilst the new roads haven't found their way on to the maps yet. On our journey from Northern Jordan to Saudi Arabia we came across the border post 150 miles before we expected to find it – a little embarrassing because we had to sit on the Jordanian side and finish off our last few cans of pork luncheon meat.

Crossing borders was the most harrowing but also often the most entertaining part of the trip. Considering that we were carrying more tea than we could legally import into France we were worried right from the start. In fact, borders in Europe posed no problems – the London University emblem on the vehicles and the sight of a British passport was enough to satisfy most border officials. In Arabia, the fun really started. Firstly, you have to sort out who is a customs official and who is just an 'agent' ready to offer his services as an interpreter and guide through the maze of offices and rubber stamps for a fee. These agents proved very useful – the one who helped us at the Syria/Jordan border was actually dumb but he proved to be an excellent interpreter in sign language! Secondly, you have to work out if the offer of a 'tip' would go down well or not: we found it could speed things up in Syria, but not to be offered in Saudi Arabia.

Because of all the rumours about the strictness of Saudi Arabian officials we arrived at the Saudi border in a very apprehensive state. Turning up on their sabbath (Friday) with two single women in our party and 500 unmarked tins of meat amongst our trailer-load of food was, we had been told, a potentially disastrous move. Certainly they queried Nonie's and Jo's visas, and they made us empty everything out of the Land Rovers and trailer, but we discovered that the customs officials had a great sense of humour and it proved to be a very enjoyable two-hour exercise in unpacking and repacking our vehicles. We found that having 'London University' written in Arabic on the sides of the vehicles was very helpful as it enabled people to recognise who we were and what we were doing more readily.

In Oman

On arriving in Oman, we spent our first few days as the guests of British people serving in the Oman military forces at Muaskar al Mutarfa'a (M.A.M.) 30 km from Muscat. They also made us very welcome on several other occasions when we visited the capital area and their advice and assistance was an enormous help throughout our stay in Oman. Our official contact in Muscat was Mohammed Kassim, the Director of Minerals at the Ministry of Petroleum and Minerals. Mr. Kassim and other members of the Ministry staff took care of all the formalities associated with our group entering the country and arranged permission for us to visit any part of the Oman Mountains.

After a brief reconnoitre in the first few days we chose two principal areas of study. Our first base camp was set up at the head of a wadi called Ghubrat Tanuf. It proved to be an idyllic spot: soft ground suitable for pitching our tents, a small stream a short walk away (suitable for washing clothes and bathing) and about 500 metres from a farm where we could obtain fresh water. The local people were extremely hospitable, welcoming us with coffee and dates and showering us with gifts of fruit and vegetables. This site was also centrally located within an area which offered us a lot of scope geologically.

Both our base camps were relatively sophisticated affairs, especially when compared to the simplicity of the local people's homes. Four tents for sleeping in were arranged around a larger main tent where we kept books and equipment and worked in the evenings. A sheltered cooking area was constructed of boulders, benches were set up and the trailer acted as a lockable pantry. Our luxuries extended to purified water on tap from 10 gallon barrels, Tilley lamps for lighting after sunset and a stereo cassette system powered by a car battery.

During our ten week stay in Oman there was enough time to pursue other activities as well as completing the geological field work. We generally worked to a routine of having one day off each week but as we neared the end of our stay and the geological projects we had undertaken neared completion, we found we had more free time.

The Oman Mountains offer enormous potential for exploration: the mountains and deeply incised wadis are spectacular and there are many other attractions such as wild flowers and the isolated settlements many kilometres from the nearest road. Members of our party frequently took day trips into the more remote parts of the mountains, particularly on the southern side of the Jebel Akhdar range. A couple of attempts were made to ascend the highest peak, Jebel Shams (3035 m), but unfortunately each failed, the last within 50 m of the summit. Other short expeditions were undertaken to an impressive cave system near Tanuf and through the gorge of Wadi Dayqah at the eastern end of Wadi Tayin.

The towns and villages are also well worth a few hours attention: the Suks (markets) at Bahla and Nizwa in particular are fascinating places to wander around and the mud-built houses of the back streets of these larger towns are very picturesque.

Oman: The Way of Life

'What were the people like?': the inevitable question and it is not easy to dispel images of rich Saudi oil-sheikhs and arrogant Cairo street sellers. Despite a cosmopolitan coastal region containing the capital city of Muscat and the nearby commercial centre of Muttrah, life in the Oman Interior is centred around subsistance agriculture. Throughout the barren and rocky mountains, agricultural land with its associated villages is concentrated in irrigated oases which line many of the wadis. Brown mud houses nestle amidst dense date-palm groves which render a patch of green noticeable for miles around.

It is in these surroundings that the Omani villagers live from day to day, working the fields and tending the goats, and it is here that we experienced their genuine and open hospitality. In a country where extensive primary education is recent, secondary education confined to major towns and university non-existent, eight people in their early twenties claiming to be 'studying rocks' were a little incongruous. Nevertheless, we were accepted without reservation with a warmth and honesty that we soon learnt to be characteristic of the Omanis.

There had been doubts about the suitability of a female interpreter but, to Jo Armitage's relief, these proved unfounded. Although the country is Muslem, the women do not adopt the veils which we generally associate with Islam and there is no obvious division between the male and female sectors of society. As foreigners we were curiosities but as a woman, one was no less readily accepted. Far greater a stumbling block in mutual understanding was her obvious marriageable age but lack of husband and children. Bringing children into the world is the Omani priority and life is governed by the family structure. Jo's situation aroused heartfelt sympathy and genuine sorrow from everyone to such an extent that, on one occasion, she was actually offered a two year old boy to take back to England and had great difficulty in satisfactorily explaining why it couldn't be done.

Reactions to our Arabic were varied: some people had no concept of an alternative mother tongue but the more usual response, and one of which we should not be proud, was the categoric 'English people don't speak Arabic'. Hence any efforts pleased and amused everyone and the gesticulations and mime needed to explain the finer points of a specialised conversation were the source of great hilarity. At present English is not spoken at all in the Interior and a knowledge of Arabic is necessary for even minimal communication. However, widespread introduction of primary education has allowed every child the opportunity of four years schooling, with English lessons beginning in the fourth year. This has inspired a continual chorus of 'how-are-you?' from the children and we soon learnt that any reply other than 'I'm fine, thank you' was incomprehensible and resulted in repetition of the question.

With education such a recent development, school is

still a novelty and there is a tremendous enthusiasm to learn evident in all the children. However, the lack of an educational atmosphere in the home limits their progress to school hours, a problem which has prompted many schools to introduce basic reading and writing classes for adults.

The day-to-day life of the Omani villagers has changed little despite the new schools. The field of vegetables and the herd of goats provide the family's only source of income and the work is shared by the whole family. There is a rough division of labour. The men supervise the date plantations, work the fields, repair the irrigation channels and take the produce to market, while the women collect water and firewood, cook, make and mend clothes and do the washing. The children clamber over the mountains, herding their goats with an unbelievable agility. Although their work is never done, the Omanis seem to have no concept of time: their time is yours and as a passing traveller you have a right to their hospitality. Their greetings are demonstrative and their courtesies elaborate: it would seem that a degree of repetition is essential to ordinary politeness. The welcome materialises instantly in offers of 'gahwa', an indefinable word meaning in practice anything from a cup of strong black coffee to a full meal. Any refusal would deeply offend your hosts and it is quite usual to be accompanied around a village and be expected to accept a minimum of three cups of coffee in each household.

There is no doubt that we were very privileged to be able to spend two and a half months in the Oman Interior and to be allowed to share such a simple and genuine attitude to living. The realisation that further communication with our friends and neighbours, who have no addresses and do not read and write, was impossible added to our sorrow at having to leave but the response to this was a typical one: 'Stay here. You can build your house next to mine and find a husband and have a family. You'll be very happy.'

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