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This, the fourth journal of the Mendip Caving Group, has been produced quarto size in order to bring it into line with the monthly newsletter. I would like to take this opportunity to thank everyone who has contributed, but especially Pete Goddard and Arthur Cox for their invaluable assistance with printing, and Tony Knibbs and Malcolm Cotter for their help in producing the illustrations. Mike Brace printed the cover, which was designed by Tony Knibbs.

J.C.R.

CAVING IN MALAYA

by

M.O. Cotter

One of the first questions an enthusiastic caver will ask about a country will concern the possible existence of limestone, and the areas in which it occurs.

Before leaving for Malaya the only sources of information I was able to find were small scale geological surveys and an account of the Batu Caves. Both sources tended to be misleading. The survey showed widespread limestone but it was not obvious that most of it lay beneath an alluvial plain a little above sea level.

The significance of limestone hills could not be realised as they were not shown on the maps. The description of the Batu Caves also included words about the Karst, which led me to believe that the limestone was extensive at that point whereas it is actually less than one square mile in area. Shortly after arriving in Singapore, my wife paid a visit to Raffles Museum and came across, 'Bulletin of the Raffles museum No.26' February, 1961. In it was an article about the limestone hills of Malaya and a plan showing their location.

We found that our nearest outcrop was the well known one of Batu Caves situated some seven miles north of Kuala Lumpur about two hundred and fifty miles from Singapore. I will start by giving a note on the distribution of limestone suitable for locating caves. There are two main types topographically, the first being limestone hills or mountains. These hills are nothing like Mendip in size or form, the majority being less than half a mile across. The sides are precipitous and here one can draw a parallel with Cheddar Gorge. Imagine a flat plain out of which rises a stack-like structure about eight hundred feet high, bounded all round by overhanging cliffs. In places the cliff is broken by great gullies leaning inwards and full of vegetation. The only method of ascent is up these breaches. The slope has intervening pitches invisible from below because they are masked by vegetation. Roots hang down the cliffs for over 100 feet like long ropes. They are excellent for climbing. The outcrops occur on each side of the granite mountain backbone; none occur south of Kuala Lumpur.

The second major limestone feature occurs in the north of the country and constitutes a natural boundary between Malaya and Thailand on the west. At this point there is a range of low limestone mountains just over 1,000 feet high for the most part but reaching about 1,800 feet in some places. The limestone uplands are fairly easy to reach because they are traversed by good paths which have been laid down to serve the tin mines occurring in many of the caves. The whole area is thickly covered with vegetation but even so one can distinguish a clint-like structure beneath. The vegetation itself is not quite as dense as in the rain forest with poorer drainage. There are holes all over the place. Those near the path have been descended by prospectors. There are also very large shake holes with shafts in the bottom. Some of the shake holes have mining camps situated within the hollow.

In the limestone hill caves there is generally no water and the caves are merely remnants of an older drainage system; however in the mountains the caves are often active with streams and rivers running through. The hill caves also shown relatively little vertical development, only three shafts having been seen by us. The mountain range caves show all forms from potholes opening onto the uplands to caves in the valley sides debouching streams. We did not see any uplands swallets. Water is generally not deep, although one can usually expect a rather pleasant wetting. As a diversion I must add that the miners go about their work bare-footed and were very worried when we wanted to go down with boots on. They thought this as unnatural as you would if someone wanted to go down Swildon's barefoot. At one cave mine we were induced to go barefoot. What agony it was! I can well see how these people can walk fire if they do this as a regular thing.

The caves in the limestone hills are generally enormous in section, many of the passages being much larger than G.B. Main Chamber. Unfortunately they seldom go for any great distance. The largest of the Batu Caves, the Dark Cave, is over 4,000 feet long. It is obvious that the other caves nearby join up, by way of blocked passages. The total length of open ways at Batu Caves is about 7,000 feet.

On the other side of the mountains are small caves in Bukit Chintamani. Also near Raub and extending into Bukit Serdam is a cave called Gua-Kling or Gua Kechil. This cave we surveyed to 760 feet. Numerous very large caves over a thousand feet long occur near Jeranbut at Kota Glanggi and Kota Tongkat. These caves are being worked for phosphate produced from bat droppings. The deposits are estimated to be 100 feet deep in some places.

Near Ipoh are a number of limestone hills; One near Gunong Tempurong rises to 2,002 feet, the highest limestone point in Malaya.

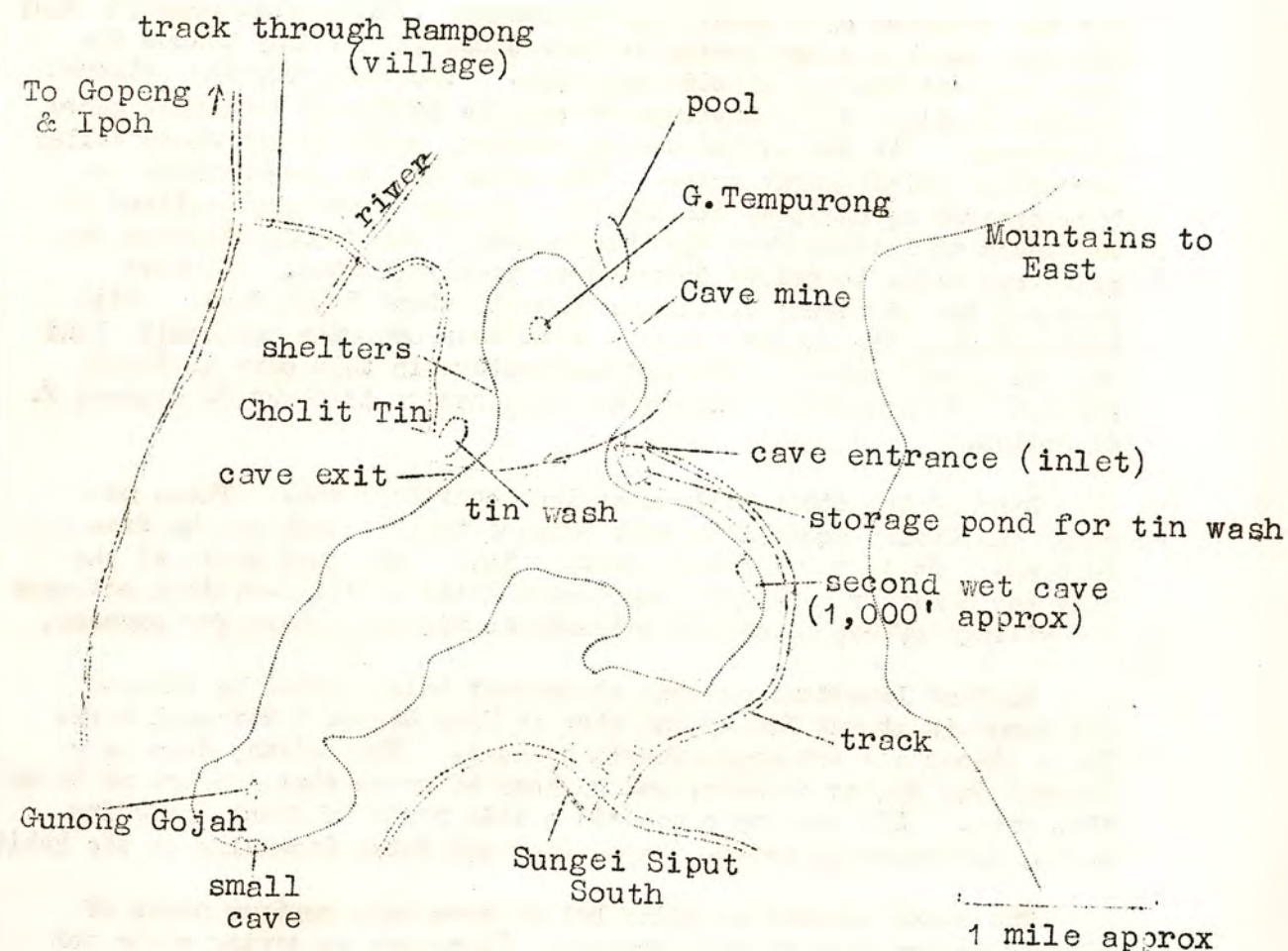


Diagram I Sketch of a Hill South of Ipoh

This mountain also has the largest and most interesting cave we have yet visited. It is unusual among the hill caves in that it contains a stream. The water comes from the main mountains and runs through jungles until it enters the cave. I feel that the pattern of drainage has altered very little except that the softer deposits each side of the limestone have been lowered resulting in high stream passages. The upper and larger part of the cave shows

all the evidence of a solutional beginning. It is also possible that the cave has had a dry period at some time, for in many places the river has cut through calcite deposits. The water running through reaches daylight in an environment totally different from that where it entered. At the outlet are the burning sands of the Kints Valley supporting mainly hardy grass. The mulch of the jungle floor has been removed by opencast tin mining. On our first explorations of the caves we entered from the jungle end; the journey through the cave from inlet to outlet takes about twenty minutes. We have surveyed the streamway so far and make it about 5,200 feet. With side passages the length would be well over one mile, probably about one and a half miles. The air temperature in this cave is fairly close to 77 degrees F. The water temperature is about 80 degrees F. at outlet.

Many of the other hills near Ipoh contain caves. Those near roads and easily accessible have Chinese temples such as the Sam-Po Tong. These temples vary quite a lot. One just north of the city has a rather mercenary management while a little-visited one near the village of Gopeng offers refreshment without asking for payment.

Another limestone outcrop at present being worked by Chinese for guano is at Gua Musang and also in King George V National Park. These places are not approachable by road. The railway does pass through Gua Musang however, and we hope to reach there before we leave this area. All the caves contain a wide range of fauna including worms, cockroaches, crabs, frogs, fish and bats, depending on the habita

The above account is brief but we have made copious notes of all the information we came across. There are no caving clubs nor do I think there will be any for a long time to come. Members of the Malayan Nature Society often write reports and these can be found in their journal.

Grid references to caves:

Batu Caves (Dark Caves)	3B/15	618080
Gua Kling or Gua Kechil	3B/4	921806
Bukit Chintamani	3C/9	020332
Gua Terus	2E/14	983656
Tempurong River Cave	2N/9	027502

SWITZERLAND 1963

by

A.J. Knibbs

Driving eastwards out of Bern the R.10 road to Luzern winds easily through small picturesque villages set in pleasant green valleys. After about 30 miles, near the village of Shupfeim, we turned towards Flühli; a few miles beyond the village lies the small skiing resort of Sörenberg. A steep track leads to the high pastures and, finally, to the foot of the inclined plateau of bare, serrated limestone - the Schrattenfluh lapiaz. It was in this region that we spent our first week in Switzerland in the excellent company of members of the Speleo-Club des Montagnes Neuchateloises.

Having united at the frontier post of Col-des-Roches we had driven directly to Schrattenfluh with a view to camping near to the lapiaz. Some difficulty arose with the "paysan" and reluctantly, having argued with much gusto in three languages, we resigned ourselves to return to Flühli and occupy a T.C.S. camp-site of somewhat indifferent amenities. The original plan, camping almost on the Schrattenfluh, would have considerably assisted our activities during the week enabling us to spend much more time on and in the limestone.

Tuesday, July 30th, was scheduled as a day of introduction to the area and was duly spent prospecting over the plateau. In perfect weather we abandoned our vehicles near the end of the road and walked the remaining two miles up through woods and pasture to the beginning of the lapiaz. Setting off up the bare rock plateau, inclined at 30 degrees towards the north west, we were soon sweating and puffing as we picked our way upwards across the blazing white limestone. Rubbers are the only form of footwear to be trusted on this rock. The entire surface is weathered into tiny serrated gullies with razor sharp edges which would probably render a simple fall, a nasty accident. A stop for lunch was made atop a small bastion of rock which forms one of the few landmarks in this area - "La Verrue".

Much revived we were soon approaching the crest between the summits of Hengst and Hachlen; each being just under 6,500 ft altitude. Here the party split up to examine different sectors. The success story of the day was the discovery of a new cave entrance on the lower slopes of Hachlen (about alt 5,900 ft) by Pete Moors. A preliminary exploration brought the group to the edge of a 140 ft. pitch. Other features in the area were numerous snow-filled shafts, several now

open shafts, and a stream-sink emitting a strong current of cold air. Simon found his true vocation during this afternoon when, by emitting a variety of indescribable noises, he gathered to him all the sheep on Schrattenfluh - well, nearly all.

On the following day a visit was made to the largest cave in the area. Over two miles long the Neuenburgerhoehle has two entrances; one is a pitch of 150. feet. (snow-filled at the time) and the other is an unimposing passage in a small cliff face on the rounded hump of "Boli" rising above Schrattenfluh to 5,600 feet. Changing into caving gear on the narrow ledge is a matter of some delicacy as Dick Spain will testify. Heavy kit-bags, falling off the ledge, involve their owners in a long trek down the scree slope below and an arduous return scramble encouraged by much ribald comment.

The entrance passage is a hands-and-knees crawl for several yards to a high rift passage entered by a 45 ft. pitch. This rift provides easy going initially, passing the junctions of the Aellen System and Snack bar Passage then down two short pitches with jammed boulders. From here onwards things became more intricate and, despite torrents of Swiss explanations and wild gesticulation, we continued on down Canyon Passage with only vague ideas of what else was in the vicinity. After a fine traverse along the Canyon we descended into Sardine Passage, down a 30 ft. pitch and, with a stream at our feet at last, into the "Grand Collecteur" - a stream passage of handsome dimensions. A short stop for food was made before continuing downstream to the "Salle du S.C.M.N." where the stream, augmented by a cascade from the roof, sinks disappointingly amongst boulders. Propped against a wall was a scaling pole of unusual weight and strength which has been used to reach a continuation passage 30 ft. above the floor. Unfortunately this manoeuvre was not on the days programme so, after a lively discussion on water-tracing, we began the return journey. In the Sardine Passage region an interesting detour involved us in a sporting climb in a fine clean-washed shaft. During a similar exercise on a rather loose section the opportunity was accidentally taken to impact-test a Swiss "Bone Dome". Neither helmet nor wearer appeared to be unduly perturbed although the consequences could well have been more serious.

The interest in Neuenburgerhoehle certainly does not include an abundance of formation; apart from a copious supply of moonmilk in places. What is striking is the great complexity of the system and the widely varying passage types and sizes. In a few hours duration of our visit we had seen the backbone of the system comprising almost a mile of passage and a gentle descent of 400 ft. The tour was ably conducted by André (Coco) Thiebaud and Bernard Dudan with two other members of S.C.M.N.

The newly discovered Mendiphoehle received a formal visit on Thursday, August 1st, from an M.C.G./S.C.M.N. group consisting of Peter Moors, Simon Knight, Bryan Pitman, Bernard Dudan, "Coco" Theibaud, and Pierre Wermeille. No time was lost in reaching the cave mouth, changing, and rapidly wending their way to the head of what proved to be a 155 ft. pitch - the limit of the first exploration a few days before. At this point the prospects were very good indeed; the entrance was several hundred feet above resurgence level and here was a good-sized pitch to begin with!

While Pierre and Bernard got on with a survey the rest set to and did some "gardening" at the shaft before the first man, "Coco", descended. The first twenty feet were against a loose wall, from which rocks were constantly dislodging, then the ladder swung clear from the wall and only the discomfort of negotiating Swiss ladder with 14 inch spacing reminded. The pitch gave access to a huge chamber with a floor of fallen blocks making progress and direction finding very difficult. Climbing over or under the boulders eventually led to a second chamber, again of large dimensions, having a similar floor of chaotic blocks some of which were far from stable! "Coco" and Peter pressed on to the end of the second chamber to a very dodgy boulder choke which they examined with due caution. A strong draught was coming from the choke but, inviting though it may sound in this account, two explorers at least resisted the almost suicidal promise, and returned to the foot of the pitch where the others had gathered. After a discussion on the exploration progress and some further shuffling about for an hour or so the party returned to the warmth of the plateau.

The evening of August, 1st, now held two causes for general celebration - primarily the birth of Switzerland as a nation of free cantons and secondly a sizeable new cave system on the Schrattenfluh. Both events were strongly and protractedly celebrated with the S.C.M.N. and the folk of Flühli.

Celebrating began outside the Kurhaus in Flühli at 7.30 p.m. with a stirring address given by a prominent gentleman in Schwyzerdütsch followed by traditional dancing in national costume, a flugelhorn duet, a William Tell sketch, and a splendid Alpenhorn solo - all items being separated by brass band-type noises. With a final flurry of fireworks the crowd moved en bloc into the best village inn "Die Sonne", where we all trooped upstairs to fill a huge room into which the whole village was packed and the band as well. After a few deafening pieces from the band the serious business of the evening began as bottles were arriving in quantity. The band was replaced by a very musical

trio to which we stomped - swayed perceptively - and continued stomping until almost sunrise. Staggering out into the dawn, full of the excellent Kaffee-Schnapps and other beverages too numerous to mention, we prescribed for ourselves a lengthy sojourn in sleeping bags before further activity.

Fully recovered the following day we divided into two groups, those aspiring to loftier and more strenuous pursuits set out to climb the path up the Brienzer Rothorn (7056 ft.) while others returned to the Schrattenfluh to do some more prospecting. Those who ascended the 'horn' declared it a stiff climb to the hotel at the summit but with a very rewarding view of the high alps to the south. The Schrattenfluh group examined the edge of the lapiaz in the immediate vicinity of Silwange looking into several impossible holes and finally ending up at a promising-looking dig emitting a blast of cold, "cavey" air - battle commenced! With only hands as tools we were soon thwarted by a single boulder requiring a crowbar to shift it. Our last prod at the Schrattenfluh was not to produce another Mendiphoehle - at least not this year.

August, 4th brought our stay in Flühli to an end and, saying Au Revoir to the S.C.M.N. we headed towards the high Alps and, by some misfortune, we ended at Kandersteg - home of the "Chez Max" nosh establishment - realising how peaceful and pleasant Flühli had been compared to this tourist ridden region. Still, there were the mountains and the glaciers to which one could quickly escape by cable car or chair lift. Visits were made to the Oesdiumensee, Gemni Pass, and Kanderfirn Glacier. After three days in this environment we headed north-west towards the Jura taking, as we did, a detour to Grindelwald to see the first 100 ft. or so of the Eiger wall and a bonus amount of cloud.

Late in the evening of August, 7th, two Landrovers squelched into a small pine copse on the campsite at La Chaux de Fonds in the Jura. Half an hour's shuffling about in the pine needles saw the tents all pitched, and a steady migration to the camp guardian's shack began where intoxicants were on sale, even at this late hour, to counter the effects of the damp weather. Some form of bush telegraph must operate in La Chaux de Fonds for we were very soon joined by a vast number of S.C.M.N. members with whom we were soon discussing plans for our remaining few days. The following days efforts were divided between the Gouffre de Pertuis and the Grotte de Lierre.

Driving first to Cernier to collect our young aide-de-gouffre, Erik, we zig-zagged up through the forest to Chezard-St-Martin where we parked at a solitary Inn and changed into caving rags. Climbing

up one side of the little gorge through which the road runs we soon arrived at the mouth of the steeply sloping entrance passage running down to a wooden platform and a fixed wooden ladder for the first pitch of 10 ft. arriving at a sort of wooden catwalk from the end of which a 45ft. ladder was hung for the second pitch. Landing on a shifting scree slope some care was required not to step the wrong way as the brink of a third pitch was very close. Ladder for this pitch of 90ft. was clipped on to the previous ladder and an intermediate belay arranged. A check of tackle at this point revealed that we were nearly 80ft. short of the amount needed to bottom the pot and brought some caustic British comment on the counting ability of British cavers; we blamed the metric system - or was it our translation of it! Our problems were eventually solved by Erik who cheerfully volunteered to remain at the head of the third pitch and lower the 90ft. of ladder down to us and then await our return. A truly selfless and magnificent gesture. We landed on a more solid boulder slope and proceeded cautiously down a high, wide rift to a fourth pitch of 30ft. where we were joined by a small but searching streamlet. A short meandering rift brought us to the fifth pitch where a short tree-trunk offered a good belay for the 140ft. of ladder. The initial part of the descent was rather cramped at the sharp end of a large rift, coated with slimy moonmilk, and occupied by a small streamlet. This unhappy state of affairs lasted for 50ft. then everything opened out and the going was easy down to a damp wide balcony overlooking a large and muddy chamber with its floor about 15ft. below the balcony. A large black opening on the opposite side of the chamber looked interesting. As the rest of the party arrived some time was available and Tony Knibbs descended to the chamber floor via the remnants of a crude wooden ladder. Crossing the muddy floor to the far side of the chamber revealed another chamber with two immense shafts going up out of sight, and a dismal little lake which marks the bottom of the Gouffre de Pertuis at 480ft. down. The return to daylight was made without incident but with an occasional outburst of discordant refrain from members who shall remain anonymous.

With Simon Knight wielding map and guide book to good effect a second group set off to explore the pleasant-sounding little cave entitled Grotte de la Lierre (Ground ivy Cave). The cave is situated at the bottom of a deep gorge through which the river Daubs runs. From the nearest point on the road to the cave entrance is a distance of some 600 yards of impenetrable jungle, brambles and loose scree entailing a drop of about 900ft.. It took well over an hour to arrive in the vicinity of the entrance which was finally located in a small cliff face and was reminiscent of the entrance to 'Pride Evans' Hole in Cheddar Gorge as a large level passage was entered. After about 60 feet the passage dips steeply and some jammed boulders

had to be negotiated before emerging into a chamber. From the end of this chamber a 40 ft. pitch, with a wooden ladder for the lower half, gives access to a small excavated passage to a low chamber which terminates the cave. On the pitch the ladder hung in a deep niche down which a malicious little stream fell between walls thickly coated with the moonmilk which seems to typify Swiss caves. The whole of this lower section was dug out of glutinous clay and an expression of sympathy for those who were digging in such horrid surroundings was forthcoming. The return to the Landrover was almost too much and at least one member was kept going only by the thought of the forthcoming evening of fondue and wine with the S.C.M.N.

The traditional Swiss fondue may not be to everyone's taste but - add some strong liquors and serve with copious draughts of wine - and it immediately takes on a property attractive to the caver. A splendid site in the Areuse Gorge had been selected; an immense arch in the cliff face with a dry earth floor and several large rocks serving as tables. The fondue was prepared jointly, and with great enthusiasm, by the S.C.M.N. and the Val de Travers Club each trying to achieve the fiercest possible brew. At least one seething potfull was set on fire to substantiate a claim as to its alcoholic content. Demolishing the foodstuffs was an animated and, in some cases, almost overpowering process. Those still able to move gathered branches to make a camp fire around which a rather onesided exchange of songs continued until the lubrication system failed at around midnight.

The next day, accompanied by Raymond Gigon, the president of the S.C.M.N., and his two children, we drove out through Le Locle to La Brevine to take a look at the Glacier de Montési. The area around La Brevine is locally regarded as the "Refrigerator of Switzerland" and, judging by the remarkably low temperature perceptible even to British skins, we had no cause to doubt this. Collecting Charles Guyot and another trog at the village we proceeded on the road to Val de Travers. After about three miles a small forest track was taken off to the right bringing us into an area of open woodland and within a short walk of the cave. The Glacier de Montési is, as the name implies, an underground glacier and it occupies a chamber 200 ft. long, 90 ft. wide, and around 60 ft. high; the chamber may be entered from anyone of three pitches from the surface - two needing a 60 ft. ladder and the third, and largest, is merely a scramble. Once inside, progress was very sporting indeed and the snowdrifts, ice sheets, and ice crystals were extremely interesting. Three of us had brought along ice-axes not really expecting to use them but finding them of more than a little assistance when cutting steps up sundry ice flows - anyway, it's not everyday that one can carry an ice axe

underground and actually have need to use it. Having become quite wet from the proximity of steaming bodies and ice, and mildly exhausted by the continual acrobatics, we left the cave by way of one of the ladder pitches to complete a thoroughly-enjoyable trip.

The 10th August, our last full day in Switzerland, was devoted to an exploration of La Grotte de Motiers in the Val de Travers. Arriving in the village of Motiers we found no difficulty in locating the cave - a large portal with an excellent changing area nearby. Clambering over large fallen blocks at the entrance we entered a large gently ascending passage with a rocky floor. Passing on our right we continued up the dry river bed into a chamber with some good remnants of formations and a small showerbath from one corner of the roof. A way was found through the boulder floor and we soon arrived in another roomy section of the main passage. Here, however, a slight navigational error resulted in seven cavers halting nose to tail in a narrow, muddy cul-de-sac. Retracing our steps we split into two groups and set about examining side passages. One group drew several blanks whilst the other found a roomy, ascending passage with a floor of deep plastic clay. Crossing a small pool two right-hand passages were found to end at clear greenish sump pools (actually the subterranean river) then, continuing forward through a long crawl and crossing two more pools, we arrived at a descending terminal rift. A muddy chimney in the roof here showed little promise. Returning to the main passage we examined the branch passage noticed on the way in; a brisk descent brought us to a clear waist-deep pool with the roof lowering ominously then rising abruptly to allow plenty of standing room at a 20ft. climb straight out of the pool. However, the passage soon descended to the subterranean river at another large, green tinted sump pool. This was our last evening in Switzerland and, to mark the occasion, a combined M.C.G./S.C.M.N. party had planned a monumental pint-raising session which lasted well into the following morning.

All things considered, the fortnight had been most enjoyable; the grand hospitality of the Swiss particularly so. The impression gained of caving in Switzerland was one of much regional variation, increasing and well directed impetus in scientific fields, and very much more yet to be done. The longest cave in Switzerland is Hölloch with over 47 miles of passage. The deepest is the Gouffre du Chevrier at slightly more than 1,500 ft. deep. From these examples it can be appreciated that, within a comparatively small, strikingly beautiful and congenial country, there exists ample opportunity for the caver whatever his standard of technique, or inclination.

EVERY CAVE HAS A HISTORY

by

C.F.Reynolds

One of the most important agents in forming caves is water. Below the water table the limestone is slowly dissolved and when the water level drops the cavities fill with air. Active streams invade these spaces and excavate channels through the rock. Other water trickling down the walls and dripping from the roof leaves calcite deposits. This is common knowledge to most cavers but few go one step further and investigate the intriguing problem of how a particular cave has become what it is today.

To try and read the history of a cave it is important to know a little of the history of Great Britain itself. Over the last million years this country has several times been covered with a thick blanket of ice. This had a great effect on the shapes of mountains and valleys and created large areas of glacial debris. In regions where this happened, such as Yorkshire and Ireland, caves often contain extensive deposits of this material. However in areas which were not covered with ice, such as Devon, no equivalent deposits exist. As the ice came and went the sea levels fell and rose over a range of several hundred feet. At the same time changes in the climate affected the rainfall, and these factors combined to cause changes in the river valleys. At times the rivers deepened their courses, while at other times these were filled with silt or resulted in widespread deposits such as the gravel beds in the Thames valley. The overall effects were often quite marked and some rivers even changed their direction of flow. To give an example, about 700,000 years ago the River Dart flowed due east off Dartmoor to reach the sea at Teignmouth. At this time the river bed was at about 420ft O.D. at Ashburton and the sea level was about 300 ft O.D. At Buckfastleigh there was probably a range of hills reaching to about 500 ft. O.D. or more. Later the river changed its course to flow via Buckfast leigh to the sea at Brixham, and now its mouth is at Dartmouth. At present the river level at Buckfastleigh is about 100 ft O.D. and the flat top of the hill in which most of the caves lie is at 275 ft. O.D. The flat top of this hill represents an intermediate level of the river.

All the above changes affected the behaviour of the water in a given area. The water table, the natural level of water in the rocks, varied with both changes in the level of the rivers and the rainfall. At times the water in a given area was frozen, the freezing sometimes extending many feet underground. These changes have moulded the caves of this country and with a little trouble one can learn a lot about their history. To illustrate this an example may be of some help.

In part of Bakers Pit Cavern, Devon, there is a stream passage where an examination quickly reveals that one time the chamber was nearly filled to the roof with a characteristic silt deposit which has been partially excavated by the stream. However, a close look at the roof and the right-hand rock wall reveals a fine tracery of mud. This represents the insoluble parts of the limestone which remain when the rock dissolves under phreatic conditions. As it is inconceivable that the stream which excavated the trench could do so without destroying the very fragile remains, the only possible explanation is that the mud formations are more recent than the stream trench. From this, and other evidence it is possible to say that there were at least five major phases in the history of this part of the cave:-

- 1) A large cavity was formed by solution deep below the water table.
- 2) This cavity became filled almost to the roof with mud.
- 3) The water table fell below the level of the cavity and a stream cut a channel through the mud fill.
- 4) The water table rose flooding the cave, and further solution of the rock took place to leave the fine tracery of mud.
- 5) The water level fell again to leave the cave very much as it is now, with the stream flowing in the stream trench again.

In fact this example applies to only a small part of the Buckfastleigh Cave System. Diligent searching reveals many other features, all of which add to one's knowledge of the very complex history of these caves. Thus a half tube in the ceiling of Boulder Hall coupled with scallop marks high up on a small area of wall suggest that the large chamber was once filled to the roof with mud which was removed by a vadose stream. Black deposits over calcite flows is evidence for further flooding. Cracked calcite floors support other evidence for an earthquake. Correlation of the water levels with river terraces outside the cave allow tentative dating of some of these events, as do large cones of earth containing bones of prehistoric animals. Elsewhere, evidence of freezing indicates the passing of an ice age.

On Mendip the problems are very different to those in Devon and I have not studied any of the caves in detail. However there are many problems that need to be solved. A few are suggested below.

Ubley Hill Pot When one climbs down the ladder into the main chamber one lands on a mud ledge, the nature of which suggests that the cave was at one time filled with mud to this level. Why, when and where did the mud go?

There is also the problem of how and when the bones got into the cave.

Read's Cavern As one climbs deeper through the boulders the fossils become sharper. A study of the "sharpness" with depth might reveal the level of the water in the cave at the time when the ruckle formed.

Longwood-August Hole. In this cave, and in many other Mendip caves, there are boulder deposits cemented with calcite and in places broken up again by the streams at present occupying the caves. This might be due to the following phases:-

- 1) Cave occupied by active streams.
- 2) Ice age conditions cause the caves to become choked with boulders, etc.
- 3) Calcite seals the boulder deposits.
- 4) Active streams re-enter the caves.

If a history of this nature could be shown to be true it would have interesting consequences. The present day streams will not always follow the same courses as the earlier streams and in attempts to get to Cheddar it might be easier to follow the courses of the fossil streams rather than to force sumps in the present active streams. It is also possible that phase 2 might be related to the formation of Cheddar Gorge. Thus if for most of the history of the Mendips all surface drainage disappeared down swallets any change in climate which blocked these swallets would mean that the water would have to find another route to the sea. Because of the steep sides of the Mendips the large quantities of water involved would be expected to cut a steep-sided gorge in a relatively short time. However detailed field observations are needed before it can be said that there is any direct connection between the calcite covered boulder deposits in Longwood-August and the formation of Cheddar Gorge.

I look forward with interest to seeing the answers to these, and many other such problems, in the future.

AUGUST HOLE: NEW DISCOVERIES

by

A.J. Knibbs

During the weekend of September 22nd/23rd 1962 a party of six members spent twenty-eight hours in August Hole. Two objectives were in mind: The first was to excavate a way through the boulder choke which forms part of the floor of a small chamber which is reached by following a low passage running roughly south out of the Oxbows chamber. This small chamber has the appearance of being part of a high rift, about ten feet wide, with an overhead choke and a floor of partially stal-covered boulders. A subsidiary objective was that of digging a small sand-choked passage also leading south from the Oxbows chamber.

To enable as much work as possible to be done in the weekend it was decided to sleep underground using the Oxbows chamber as the living quarters. The location is a dry one with a floor of muddy sand and rock fragments and without any uncomfortable draughts. This decision gave some extra incentive to the exercise and promised to furnish some useful experience of camping, or rather bivouacking, underground. On examination of the equipment list we realised the need for a support party to assist with transportation; five members performed this task. To minimise weight and bulk it was decided to use only Horlicks concentrated rations (HF 5, HF 88 bars) as food source, plus ingredients for brewing coffee. Two single-burner gas stoves, three sets of ex-W.D. mess tins, spoons and mugs completed the catering needs. A crow-bar, two entrenching tools, a lump hammer and two chisels provided sufficient digging equipment. Such was our optimism that two twenty-foot lengths of electron ladder and a hundred feet of nylon line was also transported under-ground. Sleeping bags and airbeds were taken although two members opted to forego the comfort of an airbed. Another member was deprived of his comfort by placing his airbed on sharp rocks! A dry change of clothes was taken down by each of the six-man digging party to sleep in and use in emergency if required.

Programme: No set time scale was laid out for the trip as a whole. The need was recognised, however, to avoid all possible delays in transportation and to concentrate solely on the job in hand. The total duration of the exercise was originally scheduled to be exactly twenty-four hours but circumstances directed a slight extension of the total time spent underground by the digging party. The schedule finally worked out as follows:-
Saturday, September, 22nd.

3.00 pm. Camp established and work on boulder choke began using three men per shift of 30 mins.

9.30 pm. Descending passage entered after 10 feet was excavated.

10.00 pm. Work in new passage abandoned after much prodding around and investigating. Work now commenced in the sand passage (Second objective).

11.30 pm. Work in sand passage ceased, and the party retired to bed.

Sunday, September 23rd.

9.30 am. Work began again in sand passage.

11.45 am. Support party arrived and baggage was assembled.

1.00 pm. Last shift ceased work. Digging and support parties left for surface.

4.00 pm. Exit of last man from cave.

Hours spend underground:

Digging party - 28 hours (10½ hours digging).

Support party - 9½ hours.

Results:

The sketch plan (Diagram 2) shows the area in which work was carried out and distance gained at each objective. At the rock choke 6½ hours of intensive effort through rocks of varying size, some partially cemented by stal, opened 10 feet of dug passage from which a short passage running approximately south-west was entered. A small stream was found here. Upstream, a passage of diminishing size runs back under the boulder floor of the already known chamber above. Downstream, the passage roof descends to within 4 inches of the sloping stalagmite floor of the passage but can be seen to enlarge beyond. Work with hammer and chisel or explosives may produce an interesting extension. Total length of passage discovered was disappointing at some 20 feet with a cross-section of a mere 3½ feet wide by 4 feet high. Any effort to push on upstream beneath the boulder choke looks none too promising and may be quite dangerous.

Leaving this area, work was begun on sand passage. At the start this passage could be forced for about 15 feet from the oxbows chamber and an air space of about 4 inches continued onwards. The small working space, cross-section about 2 ft. by 1½ ft., made work a slow process, although the sandy

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EXTRACT FROM M.C.G. SURVEY OF
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 SYSTEM
 SHOWING SUBSEQUENT ADDITIONS

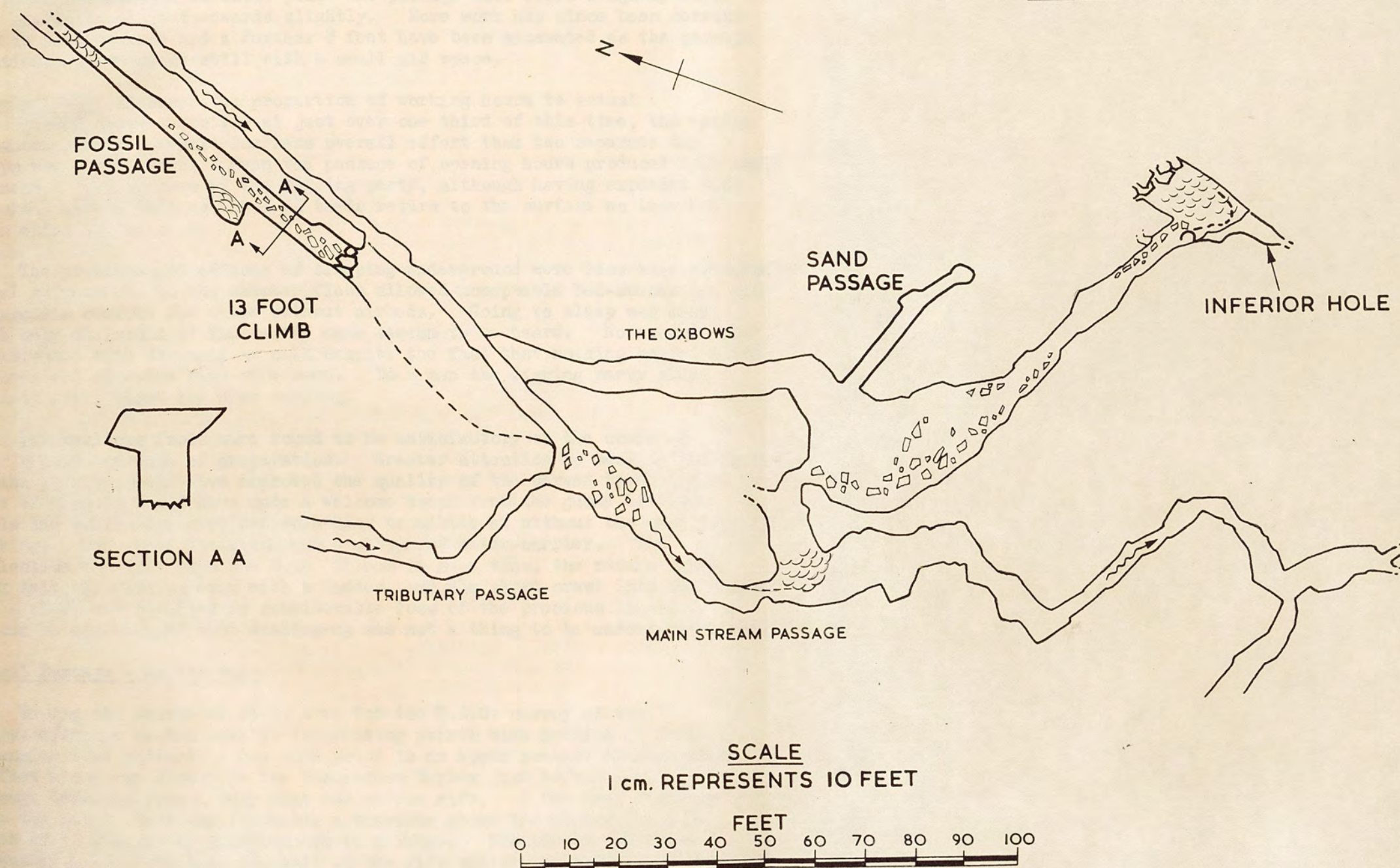


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A.J. KNIBBS JAN. 66

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material of the fill was easy to excavate. Work here produced around 5 feet of passage extension at which point the passage roof veers slightly right and starts to slope downwards slightly. More work has since been carried out in sand passage and a further 8 feet have been excavated as the passage continues descending; still with a small air space.

Conclusions: Although the proportion of working hours to actual underground hours seems low at just over one third of this time, the excise produced a better result for less overall effort than two separate day trips would have done. Even the passage of opening hours produced only small comment. The members of the digging party, although having expended much physical effort felt as fresh on their return to the surface as they had when entering the cave.

The problems and effects of sleeping underground were less than anticipated. Local adjustments to the chamber floor allowed acceptable bed-spaces and even reasonable comfort for those without airbeds. Going to sleep was easy with only the sound of the nearby main stream to be heard. No trouble was experienced with dampness or cold despite the fact that nothing beyond normal airbeds and sleeping bags were used. To a man the digging party slept solidly until eight the next morning.

The Horlicks foods were found to be satisfactory on the score of nourishment and ease of preparation. Greater attention to cooking instructions on the packets would have improved the quality of the served food. Some sort of biscuit would have made a welcome break from the gummy Horlicks meals and would have provided something to nibble at without the need for cooking. One great omission was a stoppered water-carrier. The collection of water from the Main Stream in mess tins, the return climb back into the Oxbows, even with a ladder, and the short crawl into the chamber was a chore and resulted in considerable loss of the precious liquid. It can be appreciated that washing-up was not a thing to be undertaken lightly.

Fossil Passage - August Hole

During the course of field work for the M.C.G. survey of the Longwood/August System several interesting points with promise of further extension were noticed. One such point is an upper passage located about 30 feet above the stream in the Downstream Series just before the passage develops into a very high and narrow rift. A few feet upstream from the point where one commences a traverse above the stream, an easy climb of 15 feet or so gives access to a ledge. Downstream the ledge gradually peters out into the wall of the rift whilst upstream the ledge stops below a large passage opening 13 feet above.

As the possibilities of a direct climb into this passage were not encouraging, we decided to manufacture a twenty-foot scaling pole out of 2" diam. water pipe cut into 5 foot sections and joined together by simple screwed sleeves about 9" long. A mild steel ring was welded to the top section as a ladder belay point.

Only three sections of pole were required for the actual scaling job. The operation proved very straightforward, the only disturbance being the crashes of falling rocks as the first man into the passage did a little gardening to make the climb safer. The pitons were driven into the left-hand wall of the newly christened Fossil passage to provide a useful belay for the ladder. Examination of the passage dashed any hopes of great discovery suggested by the initial size of the passage (over 10 feet high and 8 feet wide). The floor of Fossil Passage is of rock fragments and muddy sand fill which rises up the passage at an angle of about 10 degrees finally changing to a stalagmite slope which meets the roof at a point only 75 feet from the point of entry to the passage. The whole passage is bone dry and showed no sign of any recent disturbance either by water or cavers.

THE ETYMOLOGY OF CENTRAL MENDIP PLACE NAMES

by A. Cox

In the main, the West Saxons were responsible for the place-names of this area as they exist today. In this short summary the term 'Old English' (OE) must be taken to include the Nordic and Saxon contributions; to go further into the subject would be to bore rather than to interest.

The following abbreviations have been used:-

- O - Old
- E - English
- W - Welsh and Cornish (i.e. Celtic)
- Icel - Icelandic (and Scandinavian)
- ON - Old Norse (including Scandinavian)
- WS - West Saxon (in particular)
- ME - Middle English
- OF - Old French

Place - names in alphabetical order

- Bake Hole Bece; OE, stream.
- Bandpitt Farm Ban; OE, bone: pytt; OE, excavation.
- Batch, The Bece; OE, a valley or stream.

Place-names in alphabetical order - Continued

- Batcombe Bece; OE, of the stream: cumb; OE, valley.
- Beacon Batch Beacon; OE, signal: batch; Som. dialect, a hill.
- Blackdown Blac dun; OE, bleak hill.
- Blagdon⁵ Blaec dun; OE, dark-coloured hill.
- Blackmoor Blac mor; OE, bleak mor.
- Bleak House Blac hus; OE, bleak house.
- Bowery Corner Bouverie; OF, place where oxen are kept
- Brimble Pit Braembel; OE, bramble.
- Burrington Burh inga tun; OE, hill dwellers' fort.
- Callow Hill calu; OE, bald, bare.
- Carscliff Farm Carr; OE rock; cliff; OE, cliff.
- Charterhouse Chartreuse; F, the abbey of which a cell was built here.
- Cheddar Ceod; OE, a cove: draeg; OE, a slipway.
- Chewton Ceo; OE, narrow valley: tun; OE, fort.
- Compton Cumb; OE, valley: tun; OE, fort.
- Cufic Cofa; OE; kufi; Icel, a chamber or cell.
- Draycott Draeg; OE, a slipway: cott; OE, a shelter.
- Eastwater Eses; OE, demon's: waeter; OE, water.
- Ebbor rocks Y. bor; W, the ramparts: roccas; OE, rocks.
- Fairfield Wood Far, OE, coloured: feld; OE, field.
- Garrowpipe Spring Garapightel; OE, spear-shaped piece of land.
- Goatchurch Gota; OE, streamway: chyrr; W.Sax., winding.
- Great Oone's Great; E: ornes; OE, boar's.
- Green Ore Grene ora; OE, green banks.
- Haydon Grange Haeg-dun; OE, haydown.
- Holloway Hol weg; OE, sunken road.
- Lamb Leer/Lair Lam; OE, loam, clay: leirr; OE, muddy, or leger; OE, grave (later lair)
- Lippiat & Lippiatt Hlep; ON, a drop: gaet; WS, gap in cliffs.
- Mendip Mynydd eppynt; W, lookout mountains. (Also in the Brecon Beacons).
- Nordrach Noro; OE, drag; ON, a hill.
- Pen Hill Orig. Of Pen Tham; OE, W, the chief hill.
- Pin Cross Pinn; OE, wood pin for holding joint.
- Piney Sleight Penne; OE, enclosure: sleget; OE, sheep pasture.
- Pitts Farm Pytt; OE, excavation (i.e. not natural).
- Priddy Pridd - tig; W, mud, earth-dwelling.
- Rams Cliff Hremn; OE, a raven.
- Rhodyate Rhiw; W, hill: gaet; OE, a gap.
- Rookham Rocc; OE, rock: ham; OE, dwelling, village.
- Rowberrow Rhiw; W, hill: beorg; OE, mound.
- Rye Ditch Hreyrr; ON, boundary: dic; OE, ditch

Scaddens Lane	Scead; OE, boundary: denn; OE, forest, haunt of wild beasts.
Slitter	Slietr; WS, muddy.
Starve Lark	Steorf; OE, poor pasture: lach; ME, bogland.
Stoke Wood	Stocc; OE, a stump: or stoc; OE, religious place.
Swallet	Swealwe; WS, rushing water, whirlpool.
Totterdown	Tote; OE, lookout: dun; OE, hill.
Townsend	Tunes; WS, of the manor: ende; WS, boundary.
Tynings	Tyning; OE, fencing, enclosure.
Ubley	Y blaen; W, the top.
Velvet Bottom	Fiellet; OE, disafforested: bothm; OE, valley floor.
Warren	Wareine; OE, game preserve.
Wrangle The	Warngel; OE, a twisted place or stream.
Wookey	Holocig; OE, containing cavities, mispronounced later as holcig, hokey, hwokey, wokey.
Yoxter Farm	Geoces; OE, of the size of a yoke (a measure of land): tro; OE, a farmstead.

These are just a few of the possible or probable derivations of some of the local names. Further research can easily be made by reference to the excellent county volumes of the English Place-Name Society, and many other useful works.

Addendum.

CrookCrook's Peak	Creech; Celtic, hill:
Churchill	Creech; celtic, hill: hyll; OE, hill. i.e. duplicated form.
Withybrook	withy; willows.

THE COOPER'S HOLE BREAKTHROUGH OF 1962

by

M.O. Cotter and A. Cox.

It was back in 1959 that the long-sought permission of Lord Bath was obtained to excavate Cooper's Hole. Digging enthusiasm reached its peak in the summer of 1959 when numerous bones and pieces of pottery, among them some of early Iron Age type were being found. Digging was continued enthusiastically until May 1961, and a survey of the deposits was carried out in June (Ref. M.C.G. Journal, 1962).

When permission was first obtained there was a great deal of discussion regarding the best direction to dig. One school of thought was for following the roof downwards at the point where the road water vanished. The other school proposed digging straight into the cliff at right angles to the road. The first party to start work were of the first faction, but even so Richard dug a "badger hole" to the left of the main dig, but soon gave up. An opportunity to test the left wall came in 1962 when the removal of spoil and the building of the car-park retaining wall gave Don-Searle an opportunity to probe at a point where he thought there was an indication of a shelving roof at floor level. A little digging made him feel sure that an air-space, caused by more than subsidence, was present.

At Easter 1962, when normal work was not possible in Cooper's due to flooding, Don persuaded one of the authors (Malcolm) to do some work on his front, the New Dig. However, while he was tying his boots a report came up that Don was through! The way in was through a tight squeeze of course, with rock above and earth beneath. To complicate matters it sloped upwards and was soft enough not to allow much purchase for forward push. Once through, however, one came into quite a high, clean rift. The biggest surprise came when Don pointed out a stairway which had been cut in the stal-flooring in the rift. We thought that it must lead to something big, so climbed up. Alas, after another constriction we were stopped only a short distance ahead. There was a view along a bedding plane, visible as far as the torch beam would reach; unfortunately this bedding plane had a rock floor.

Digging was started at a short branch lower down. The fill consisted of angular scree with what looked like white strands of fungus binding it. There was also a strong smell reminiscent of hydrogen sulphide. At a later date we tried applying a carbide lamp flame to the supposed fungus but no effect was observed. We therefore concluded that the deposit was inorganic.

For many weeks after the discovery, work was mainly organised by the

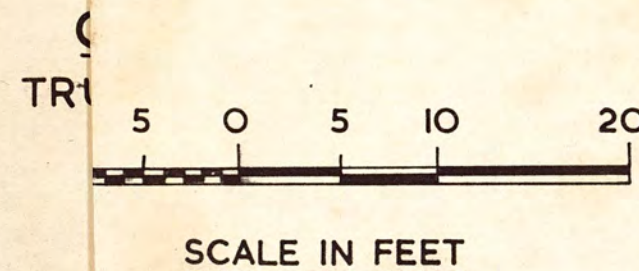
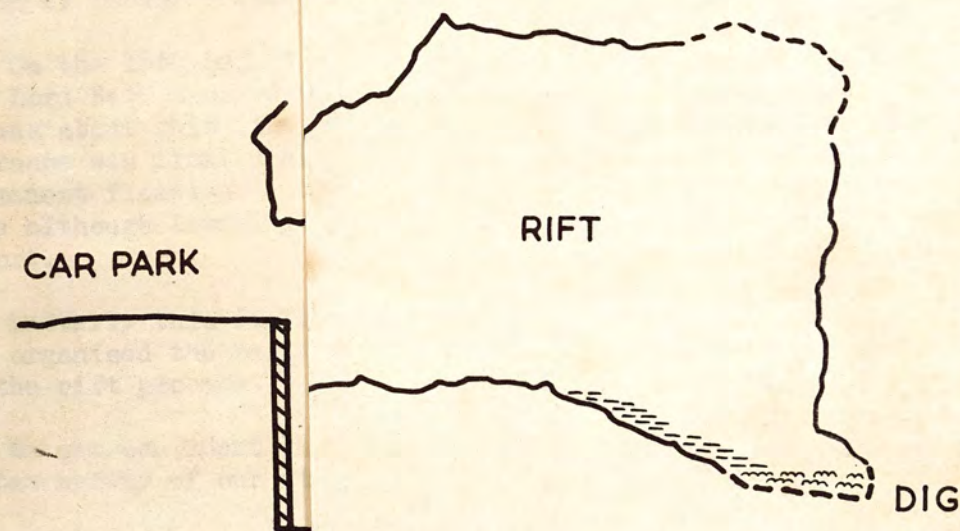
second author (Arthur). The digging we started eventually ran parallel with the bedding plane previously mentioned.

Our next exciting episode came at August Bank Holiday. Parties were working in shifts; by the time our second shift came round much progress had been made. Members of the retiring shift nonchalantly pointed out that spaces were appearing low down by the left wall. The spaces soon took on the appearance of an open but low bedding plane. This was the one we had been digging alongside. When it was possible to get a view, it appeared that the roof rose just a few feet in. At this point we returned for a sledgehammer, crowbar and gelignite. The second session party which worked until the early hours was formed of Don Searle, Ted Gabb, Norma and Malcolm Cotter. We hammered a shot hole as well as a groove, and applied some 'bang'. Surprisingly little noise was heard on detonation. After waiting an hour we investigated. Enough rock had been removed for us to take a good look through the hole. Inside the roof did rise a little. It then looked very large and stones thrown in rattled a long way. Since the fumes were still oppressive, further work was left until next morning.

Next morning, Norma, Don, Ted, Pete Goddard and Malcolm continued work. Pete did a little prodding of loose rocks ahead and it was obvious that a few feet ahead the passage deepened. Another charge was placed, fires and the waiting period observed. On our return we saw a lot of rock had come away, but it still looked as if another charge would be required. Pete urged me to give the squeeze a try. My head went through, then to my amazement I realised that the squeeze was just large enough. The roof had in fact risen into a phreatic groove just in time. The bedding plane came out into a passage over a six foot drop. The rest of the party soon followed; Don was able to get through only after the removal of a button.

Ahead was mystery, accentuated by fog from blasting operations. The way enlarged into a chamber with a deeply cracked mud floor. The fumes now disappeared fairly rapidly - I think the heat from our bodies set up convection currents - and we could see the roof rise to about 30 feet. The walls were draped with a soft red stal. In one corner were a lot of bones.

One of the most interesting features was the claw marks covering all mud surfaces. It is interesting to ponder for how many years they have been there since one of the skeletons was later identified by Dr. Tratman as Arctic Fox. The claw marks do prove, though, that



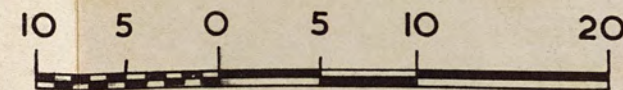
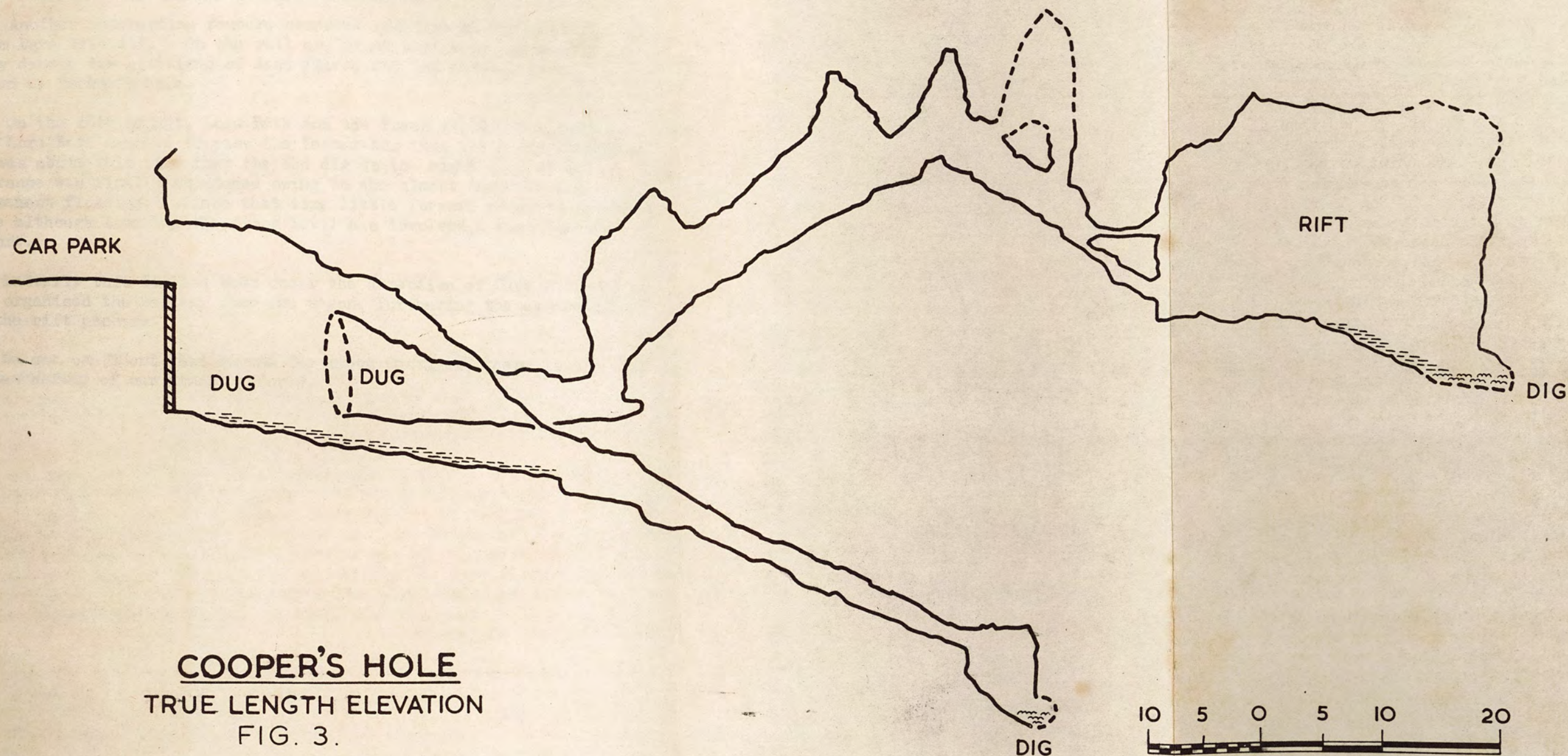
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SCALE IN FEET

there has been an open way into the chamber during the past. Probably it was by way of the low bedding plane already referred to.

Another interesting feature observed received an explanation from Dave Mitchell. On the wall are black blotches; apparently they denote the positions of dead flies, and had already been noted at Browne's Hole.

On the 18th August, Lord Bath and the Press visited the cave and Lord Bath managed to pass the letter-box into the muddy chambers. It was about this time that the old dig to the right side of the entrance was finally abandoned owing to the almost complete and permanent flooding. Since that time little forward progress has been made although lowering the floor level has involved a considerable effort.

Latterly this dig has been under the direction of Dave Mitchell who organised the railway line and wagon, furthering the excavation of the rift passage.

We are confident that beyond the known passages, there lies a cave system worthy of our utmost efforts.

A CAVER IN THE HOLY LAND

by

I.W.J. Hopkins
(Cotham Caving Group)

The limestone hills forming the backbone of Palestine have long been a happy hunting ground for archaeologists and Bible students, but their potential for cavers seems to have been little explored. True, there are few caves of the size we are used to in Western Europe, but although lacking perhaps in size, the caves of Jordan and Israel offer abounding interest to the archaeologist and geologist. Prehistoric remains from the caves of Mt. Carmel and in the Wadi Ghassul have long been known, but there are hundreds of others hidden away in desert wilderness of rocky jebel.

While spending the early months of this year on a research project in Jerusalem, I took time to have a closer look at a group of caves and rock shelters for long unknown but now famous, in the Wadi Qumran, the hiding place for nearly 2,000 years of the Dead Sea Scrolls. After their discovery in March 1947, the solitude of this desolate spot was shattered by competing hordes of bedouin and archaeologists seeking new scrolls and finding their efforts well rewarded. Over 300 caves were discovered most of them very small, of which about 10 are of sufficient size and importance to attract the caver.

We reached the ruins of Khirbet Qumran after a 15 mile drive from Jerusalem. After several miles of bouncing along a rough desert track we reached a low plateau of soft white limestone of fairly recent geological age separating the Dead Sea from steep brown cliffs of harder Cenomanian limestone. On top of this plateau were the ruins of the monastery in which most of the scrolls later placed in the caves were produced. The whole area has been systematically excavated under Father De Vaux and G.L. Harding, who was Director of Antiquities of Jordan when the scrolls were discovered.

Caves which have been hidden for 2,000 years are not in obvious places, so locating them was not easy and even in March it was hot enough in the Jordan valley (1,200 ft. below sea level) to make climbing a stick business. However some inviting openings were visible in the cliffs behind and in the sides of the Wadi Qumran, a dry barren valley to the south of the ruins. We were to find others in the spurs at the wadi end of the low plateau on which the ruins were found.

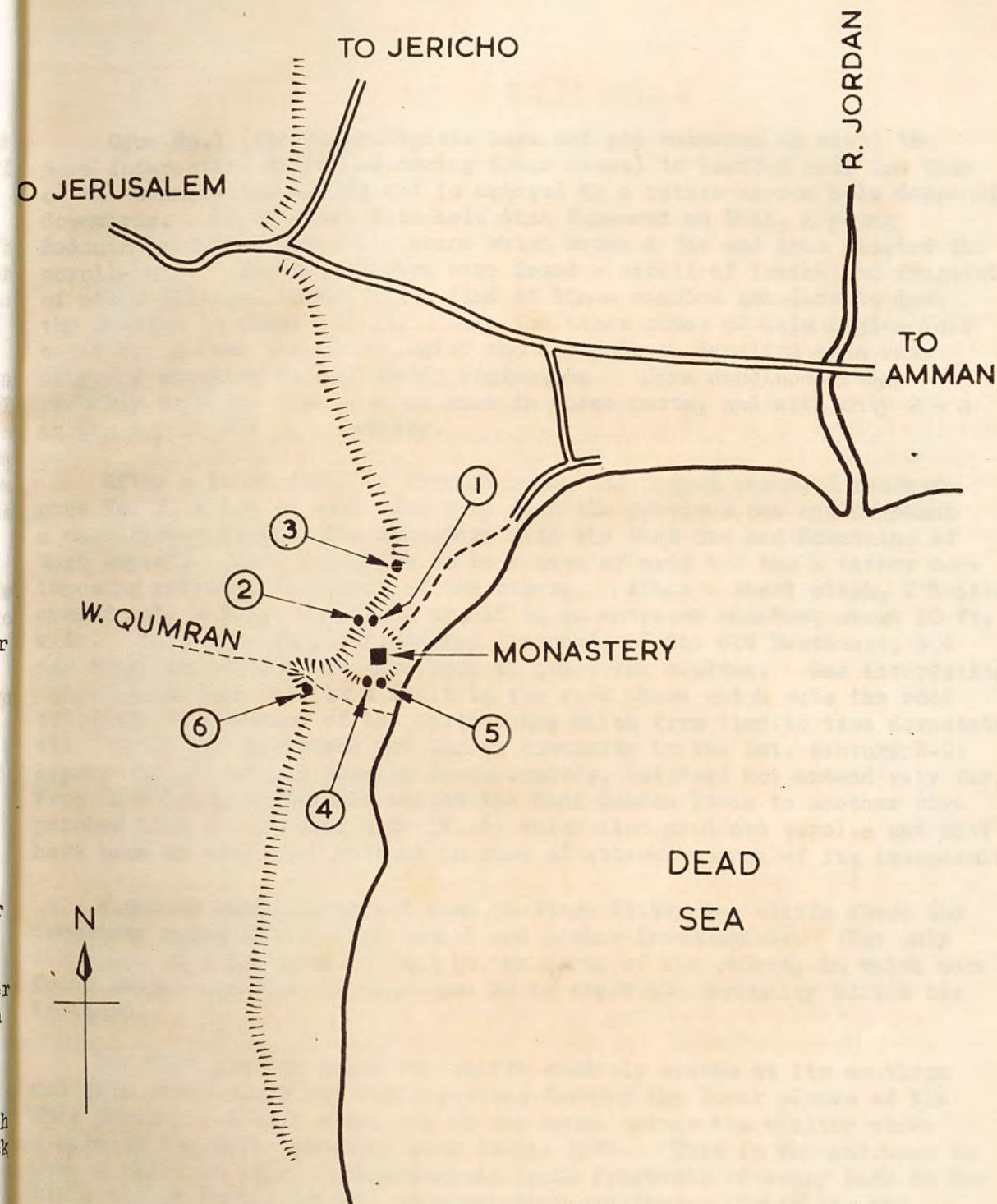


FIG. 4
THE QUMRAN CAVES

Cave No.1 (the archaeologists have not yet bothered to adopt the more interesting method of naming these caves) is located near the base of the Cennomanian cliffs and is entered by a rather narrow hole descending downwards. It was into this hole that Muhammed ed Dhib, a young Bedouin shepherd, threw his stone which broke a jar and thus started the scroll-hunt. Inside the cave were found a scroll of Isaiah and fragments of other Biblical books, and a find of linen enabled scholars to date the remains to about A.D.33. Like the other caves of this region No.1 would not please the speleologist who delights in dangling down vast drops or crawling through muddy drainpipes. Cave development has probably suffered from lack of rain in these parts, and with only 2 - 4 inches a year mud is a rarity.

After a tough scramble through scree and jagged rocks, I reached cave No. 2, which is much higher up than the previous one and commands a magnificent view of the monastery with the Dead Sea and Mountains of Moab beyond. Cave 2 appears to be a cave of exit and has a rather more imposing entrance than most of the others. After a short climb, I hoisted myself onto a ledge and found myself in an entrance chamber, about 10 ft. wide. This cave too, surrendered fragments of the Old Testament, but now there is nothing but bare rock to greet the visitor. One interesting point about this cave is a fault in the rock above which cuts the roof obliquely as evidence of the earthquakes which from time to time devastate this region and destroyed the Qumran community in the 1st. century B.C. Beyond the entrance a passage leads upwards, but does not extend very far. From Cave No.2, a scramble across the Wadi Qumran leads to another cave perched high in the wadi side (No.6) which also produced scrolls and must have been an excellent retreat in case of attack because of its inaccessibility.

Numerous other caves and rock shelters litter the cliffs above the monastery ruins but most are small and rather inaccessible. The only other one of importance is No.3 to the north of the others, in which were found copper scrolls with evidence as to where the community buried its treasure.

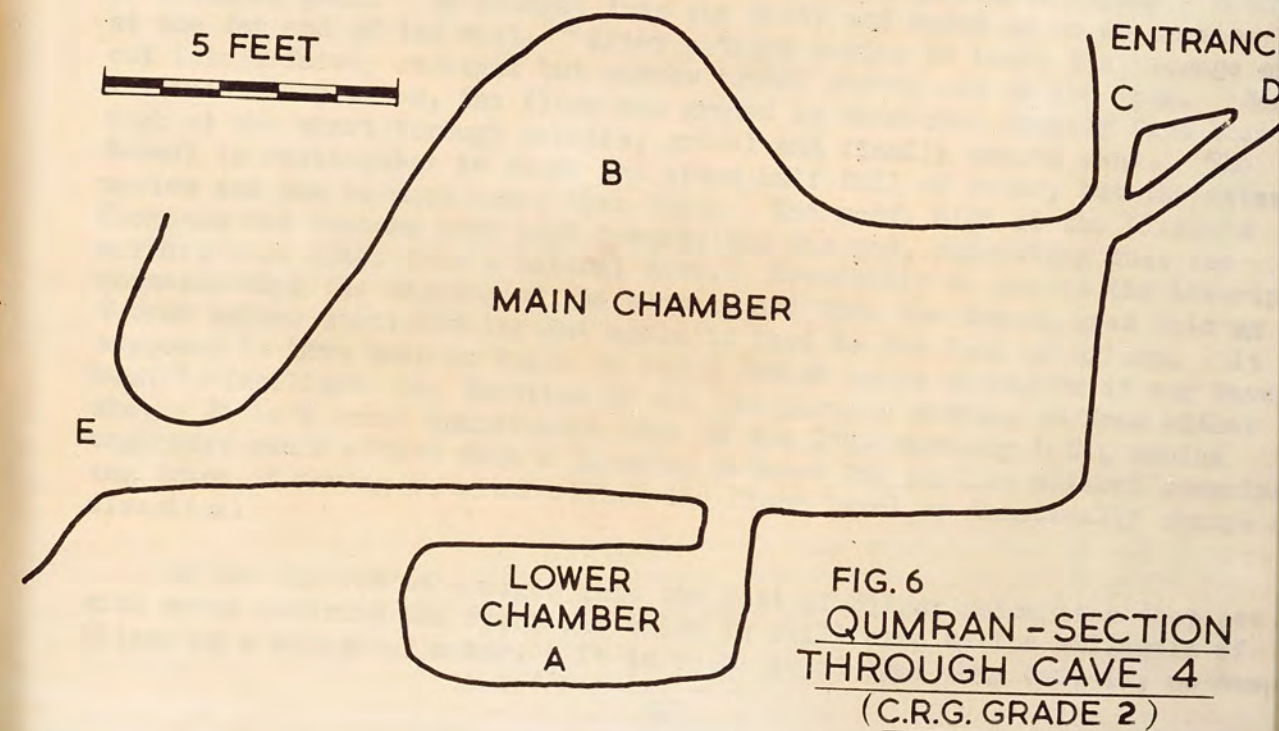
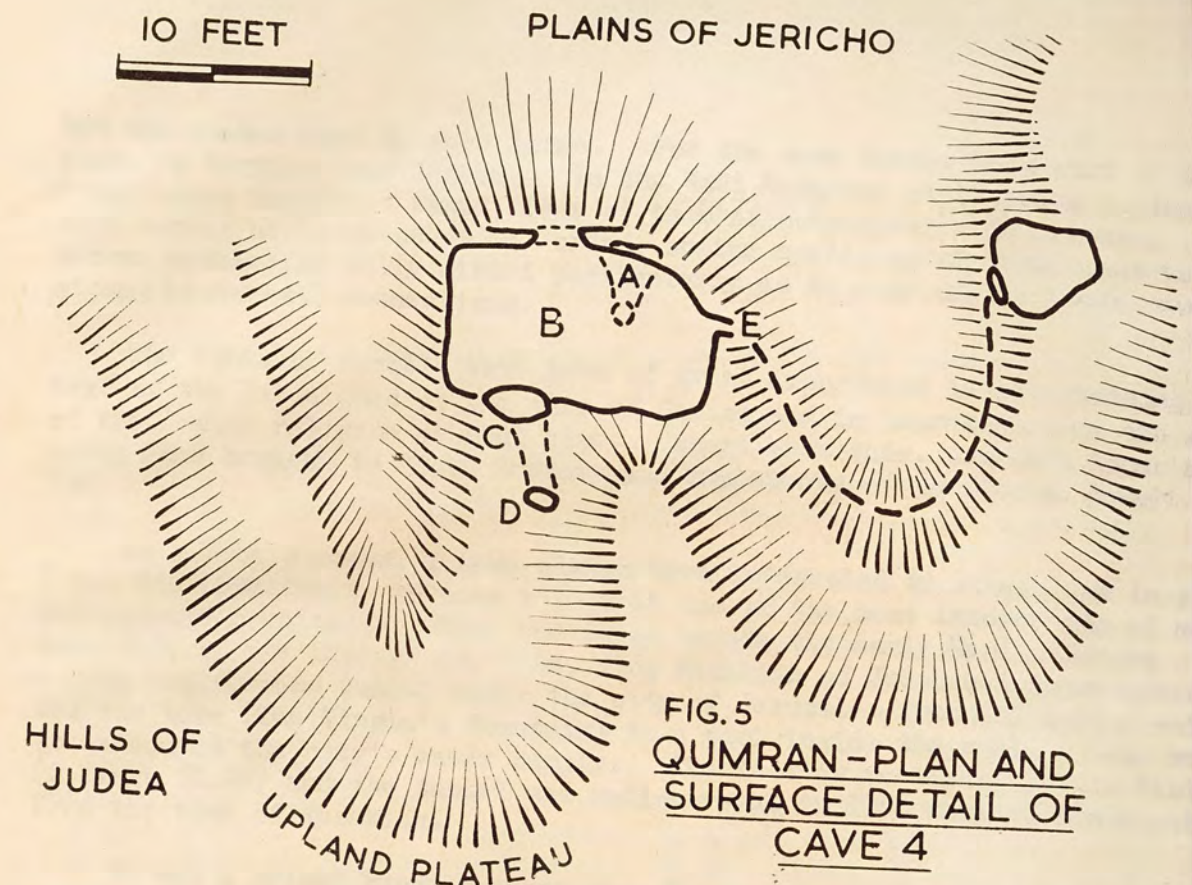
The flat plateau below the cliffs suddenly breaks at its southern end into steep spurs and small gullies forming the lower slopes of the Wadi Qumran. A walk along one of the spurs brings the visitor above a hole in the soft limestone rock to the left. This is the entrance to Cave 4 where in 1952, archaeologists found fragments of every book in the Bible except Esther as well as many other writings. There are two entrances to this cave (see diags 5,6). It can be entered via a small passage leading downwards into the side of the spur on which it is found. However this way in is not easy to get at without risk of falling on the steep slope of smooth rock. A better way is down a short vertical drop

further on from this first entrance. This drop is rather easier to get at and is only just above a man's height, so needs no tackle. On coming to rock bottom we found ourselves in a small chamber with three outlets. Two of these acted as 'windows' to give an interesting view of the wadi. While gazing out, one of the members of the party nearly fell into a small hole in the floor, which led into a small chamber directly below the first. On squeezing down into this second chamber we found it to be small and round with very smooth sides. The lack of jagged rocks in this cave stands in marked contrast to those in the cliffs and is possibly a result of the softer rock or else human effort on the part of the last inhabitants of this desolate spot. The limestone is certainly softer than in any of the caving regions of Britain and is more like chalk than some of the massive limestones of the Pennines or Mendips. It is however stratified and firm enough to support these caves. On crawling through one of the 'windows' in the main chamber I noticed another cave on a neighbouring spur and quite inaccessible from the top. With great care and ignoring comments on my sanity from other members of the group, I climbed out of Cave 4 and round the top of the small gully into this other cave. It was not very large, however, but commanded an excellent view down the Wadi towards the Dead Sea. Attempts to reach the surface from this cave were quickly abandoned on account of the slippery nature of the rock and the steep slope, so I returned to the top via Cave 4.

We returned to the monastery ruins under the bewildered gaze of Arab workers engaged on guarding the site from bedouin and over-enthusiastic tourists. They didn't seem to think that caving was the done thing for Europeans!

The ruined monastery itself is of great interest in the complexity of buildings in this desert outpost. Founded by a Jewish sect anxious to preserve their law against the Hellenistic influences of the 1st. and 2nd. centuries B.C., it could not have been founded in a more isolated place. Water was obtained by an aqueduct (still visible) leading from the base of the cliffs, and stored in cisterns, one of which shows visible evidence of the earthquake which destroyed the first community here in the first century B.C.

The efforts of many scholars and bedouin have gone into the discovery of these caves and their opening up to the public. Yet the sense of the loneliness of Qumran is still very apparent to the visitor. It stands in marked contrast to such places as Cheddar where the caver in summer has to fight his way through traffic and tourists who gape as if he were the original cave man. In Qumran one is left to the rocks and ruins and the evidence of the past which they reveal. It is probably this isolation which has enabled the caves of Qumran to remain untouched for so long. The existence of all but a few of them was unknown to the average European (or Arab) visitor or even resident of Palestine until 1947. How many more caves, there are to discover is not known,



but the number must be very large. For the cave hunter this part of the globe is fertile land indeed. In the Wadi Murabba' at 11 miles to the south other caves have been found, four of them of considerable importance. I came across no large caves in Jordan, so the speleologist here tends to become archaeologically minded particularly as so many of the known caves have strong historical connections.

The finds of scrolls have been of great importance in ascertaining the text of the Bible used at the time of Christ and in learning about the state of the Jewish religion at that time. Apart from this, the Wadi Murab'at caves have brought to light letters and implements of the Jewish Revolt of A.D. 135.

As a Mendip caver, I have always been interested in mines, and in Jordan I had the opportunity to have a look at one of the most interesting of man's underground creations. Many centuries before the early Mendip miners scratched on the surface for lead, King Hezekiah of Judah had constructed a long underground tunnel under the city of Jerusalem from the spring which fed the town (The Virgin's Fountain) to a pool inside the wall. This was to safeguard the city's water supply. The fact is mentioned in the Bible (2 Kings 20.20) and the tunnel was rediscovered in 1880 with an inscription from the time of Hezekiah.

It was a bright sunny morning when I entered the Virgin's Fountain with two friends - one a local Arab and the other an archaeologist - clad in swimming gear. We plunged into the water and waded up to an opening at the far end of the well. After a tight series of bends the passage opened out into a fairly straight but narrow tunnel carved out of the rock. Beneath the waist-deep water, the floor was graded in character ranging from bare rock at the start through pebbles, gravel and, finally smooth sand. The tunnel is rectangular in shape and about half full of water, but the water level varies and can be much lower than this. The roof, high at the Virgin's Fountain end becomes very high towards the far end, suggesting that the workers here broke into a natural cave. Eventually we passed the inscription commemorating the digging of the tunnel, and then the tunnel goes into an S-bend before straightening out again to lead to the Pool of Siloam. It is supposed to have been so built to avoid Jewish tombs above, or it may have been to facilitate the junction of the two parties cutting in from either end. It is a great achievement that in the 7th. century B.C., mining engineers could effect such a junction between two parties without showing any trace of having to alter either the floor level or drastically change direction.

At the far end we emerged into the Pool of Siloam which is a deep pit with water covering the floor and which is still used by the villagers of Silwan as a source of water. It is to be hoped that they boil it, as despite

the clarity of water in the tunnel, rumour has it that there is a leak into it from the main sewer of the city. Once again we attracted a ready crowd of local admirers although this underground trip is done rather more often than that of Qumran.

There are many other old and intriguing underground passages in the city of Jerusalem, which were first systematically explored by Dr. Schick in the last century, including ancient wells like the one under the Sisters of Zion convent, and springs. The source of the water of the Pool of Bethesda is still unknown and there are other problems of Jerusalem underground awaiting exploration.

From what has been said above it can be seen that in Palestine there is ample opportunity for underground exploration of both natural caves and man-made passages. There are mysterious caves surrounded by history and legend, such as the one at Hebron; and in the wilderness to the east of Jerusalem and in the limestone hills to the north and west, there must be many caves as yet little known. The two visits I have described are perhaps the best known and most accessible. The inspiring loneliness of Qumran and its scree covered cliffs contrasted with the cold grandeur of the ancient water supply of the capital of Judah. They only illustrate that wherever one is in the land between the Jordan and the Mediterranean, there is sport for the caver somewhere at hand.

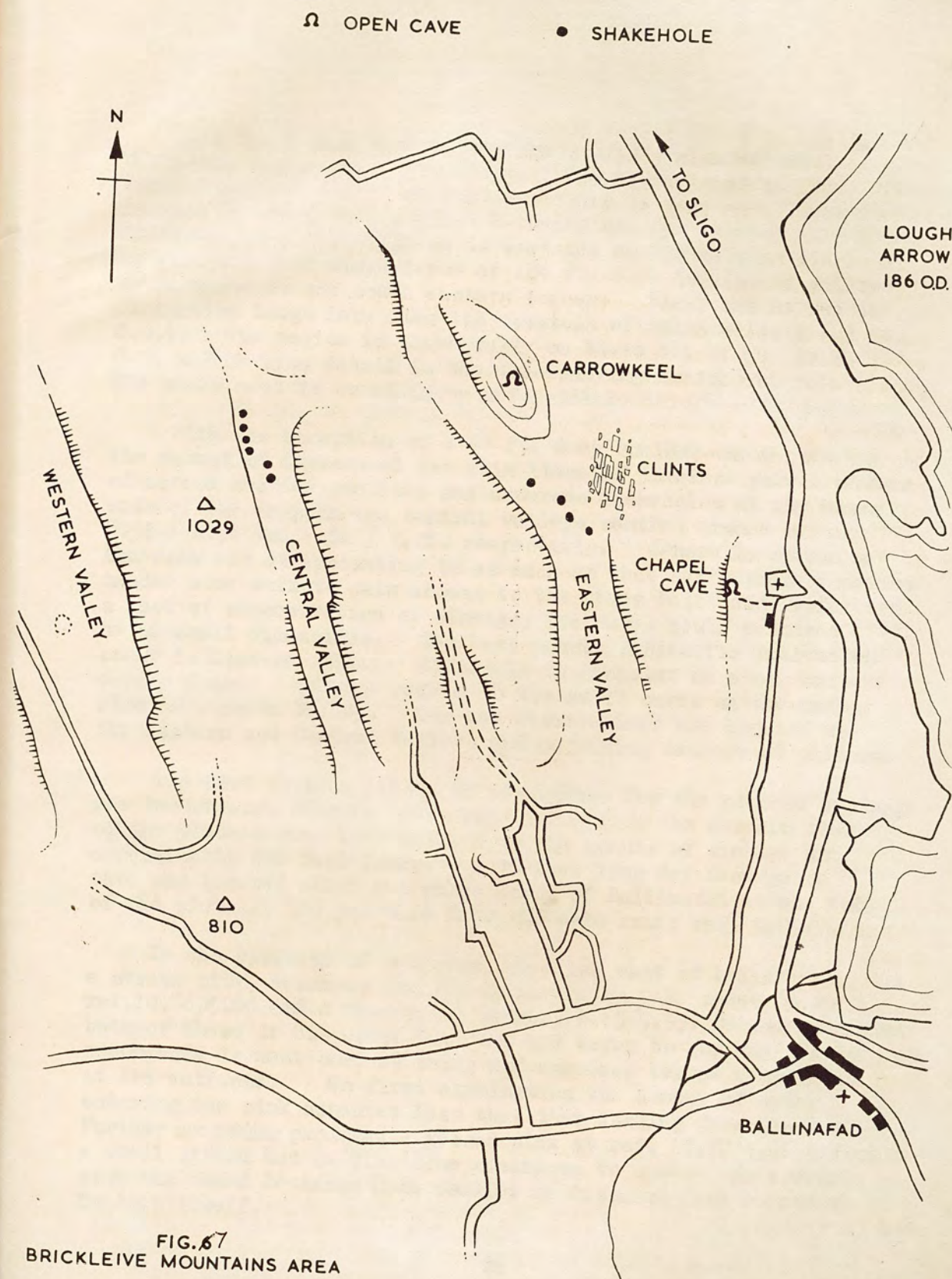
IRELAND 1962

by

A.J. Knibbs

Encouraged by reports brought back by the small party of members who visited Eire in 1961 a further visit of longer duration was planned. In 1962 the party consisted of ten members spending 14 days operating in the area of Counties Sligo and Leitrim. Our main object was to follow up observations made by the previous party and also to gain a wider knowledge of the regions. We are indebted to J.C. Coleman of the Irish Tourist Board in Dublin for his ready assistance in loaning us maps, articles, and many of his own field notes.

The reference maps used were the one inch Ordnance Survey of Ireland series. These maps proved difficult to use mainly from the outdated cartographic methods employed and from the lack of a grid system. Map references quoted in this article are Eastings and Northings, in inches, from the S.W. corner of the sheet referred to.



Our first task was the examination of the Bricklieve Mountains region in County Sligo. The region consists of a Yoredale-capped limestone plateau rising to just over 1,000 ft. incised by three well defined U-shaped valleys running in a NW - SE direction. The plateau is bordered on the eastern flank by the waters of Lough Arrow at 186 ft. O.D. Ballinafad village is situated at the south eastern corner. East, and beyond the diminutive Lough Labe lies the mountain of Keishcorran (1183 ft. O.D.). The region is shown fully on Sheet 66. of the Irish O.S. and in less detail in the accompanying sketch (Diagram 7). The whole area is overlain by a formidable thickness of peat.

With the exception of a 60 ft. deep boulder-choked pot at the summit of Carrowkeel the main items of interest were a number of active and dry swallets and numerous shakeholes at the upper ends of the eastern and central valleys centred around refs. 8.52 / 6.98 and 7.84 / 7.28. respectively. Generally speaking the area was disappointing in as much as that all surface features needed some work to gain access to the caves below and, with a lack of concentration of sinkage, the caves would probably be of small dimensions. The best possibilities for excavation occur in Eastern valley; difficult to pinpoint on a map but easily found. Coleman refers to two small caves on the west side of Western Valley. Our own observations are limited to the Eastern and Central Valleys and adjoining sectors of plateau.

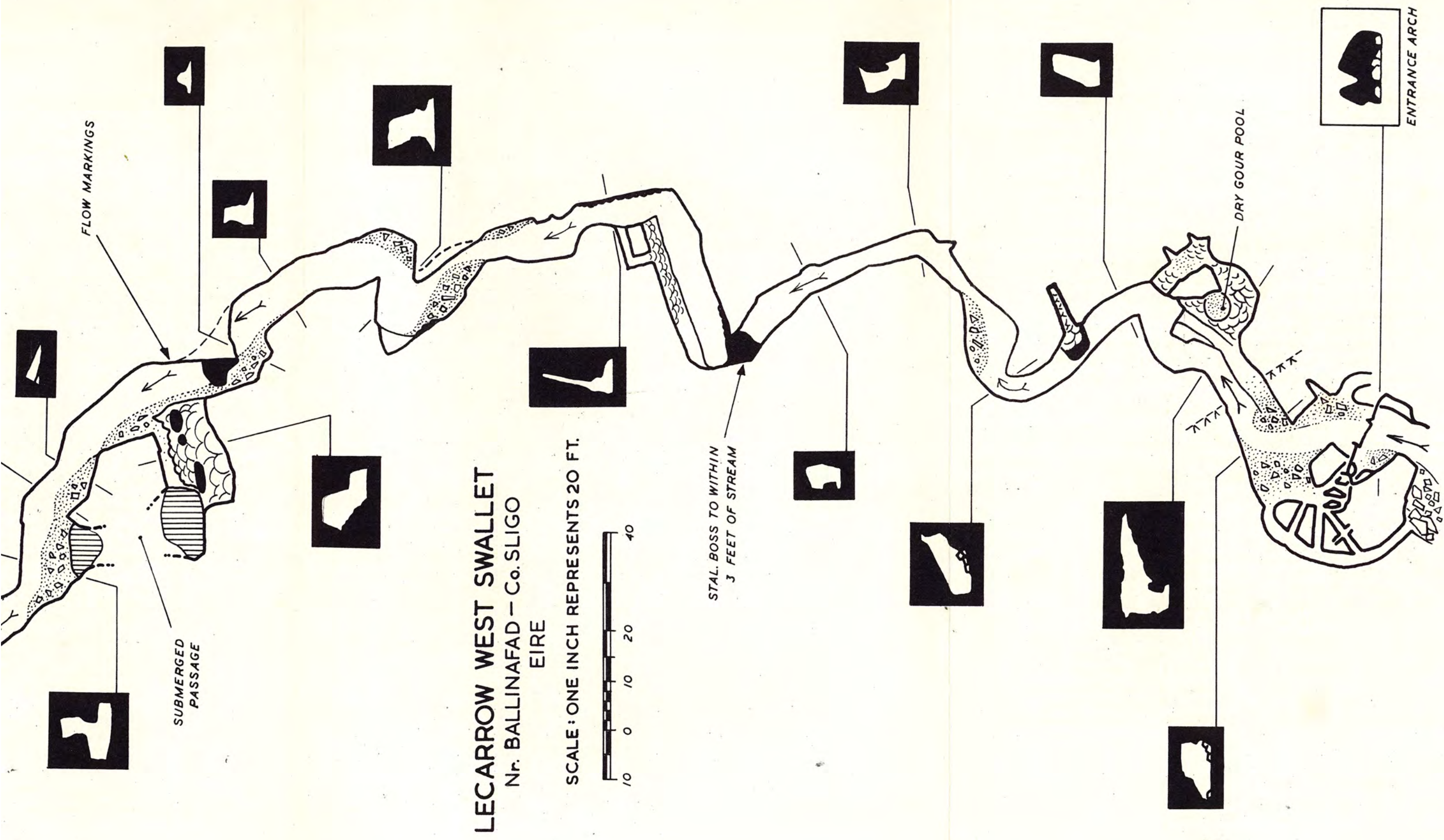
The most obvious points of resurgence for the plateau drainage are two streams feeding into Lough Arrow from the eastern flank of the plateau some $1\frac{1}{2}$ -2 miles from the points of sinkage and approximately 400 feet lower. A 70 feet long dry resurgence cave was located about two miles north of Ballinafad at the foot of the plateau, 300 yds west from the main road; ref. 9.09/7.15.

In the vicinity of Lecarrow, $1\frac{1}{4}$ miles east of Ballinafad, a stream sink, Lecarrow Swallet is marked on O.S. sheet 66 at ref. 10.66/5.80 and a resurgence at ref. 10.65/5.93. Coleman mentions both of these in his notes but does not refer to any exploration; the resurgence is mentioned as being not examined beyond deep pools at the entrance. On first examination the amount of water entering the sink appeared less than that issuing from the resurgence. Further searching produced a second sink at ref. 10.77/5.86 taking a small stream but needing some clearance to open. This small sink was named Lecarrow East Swallet as distinct from Lecarrow Swallet itself.

The exploration of Lecarrow Swallet was an enjoyable affair. The arched entrance is followed directly by an easy stream passage which follows the joint pattern in zig-zag fashion and has abundant flowstone formations; many exhibiting micro gours. After some 400 feet, just beyond a short branch passage on the left, the roof descends to within a foot of the stream and a wetting is inevitable. Proceeding downstream for a few feet the roof rises again and the passage continues at comfortable dimensions for a further 100 feet to terminate at a wide, fast flowing sump. It is doubtful if we were the first to explore Lecarrow Swallet. Shortly before the flat-out crawl two names, with a strong Irish flavour, were found inscribed on a calcite flow. With the absence of any obstacles a grade 4 survey was carried out without difficulty. Lack of a clinometer prevented a complete survey from being made, but at a guess, the cave floor descends at a gentle 5 degrees, with occasional level stretches, to the sump. There must still be some open passage between this sump and the appropriate upstream sumps in the Lecarrow Resurgence as neither of the two upstream sumps in the Resurgence suggest the close proximity of such a fast water flow as that seen at the sump in Lecarrow Swallet. The conclusion that both swallets feed the Lecarrow Resurgence stands without proof but the geographical locations and the fact that the Resurgence consists of two separate stream passages carrying streams approximating in size to those seen at the swallets makes the conclusion rather attractive.

Crossing a deep pool at the entrance of the Lecarrow Resurgence brings one into a wide stream passage with an immediate left-branching rift delivering a small stream. Following the main stream soon becomes a hands and knees crawl in the stream until, after 300 ft, a still sump pool some 15 feet in diameter is reached. This sump is the suspected connector towards Lecarrow Swallet. The left branch stream passage is of much smaller dimensions and progresses as a wet, stony crawl until a chamber and large sump pool is reached after about 250 feet. The pool is quite still, and about 5 feet deep, and favourably situated to connect with Lecarrow East Swallet. Much of the passage in the Resurgence is inclined at a similar angle, or occasionally steeper than, the passage in the swallet and shows a similar form of flowstone formations.

Any subsequent work in the area may well begin with an accurate fix of both swallets and the resurgence in co-relation and be followed by a survey of the resurgent cave. Lecarrow East Swallet will not require much effort to open and, conditions allowing, should provide an interesting addition to this system. The sumps referred to are each of a good size and should put up little opposition to diving techniques.



LECARROW WEST SWALLET Nr. BALLINAFAD - Co. SLIGO EIRE

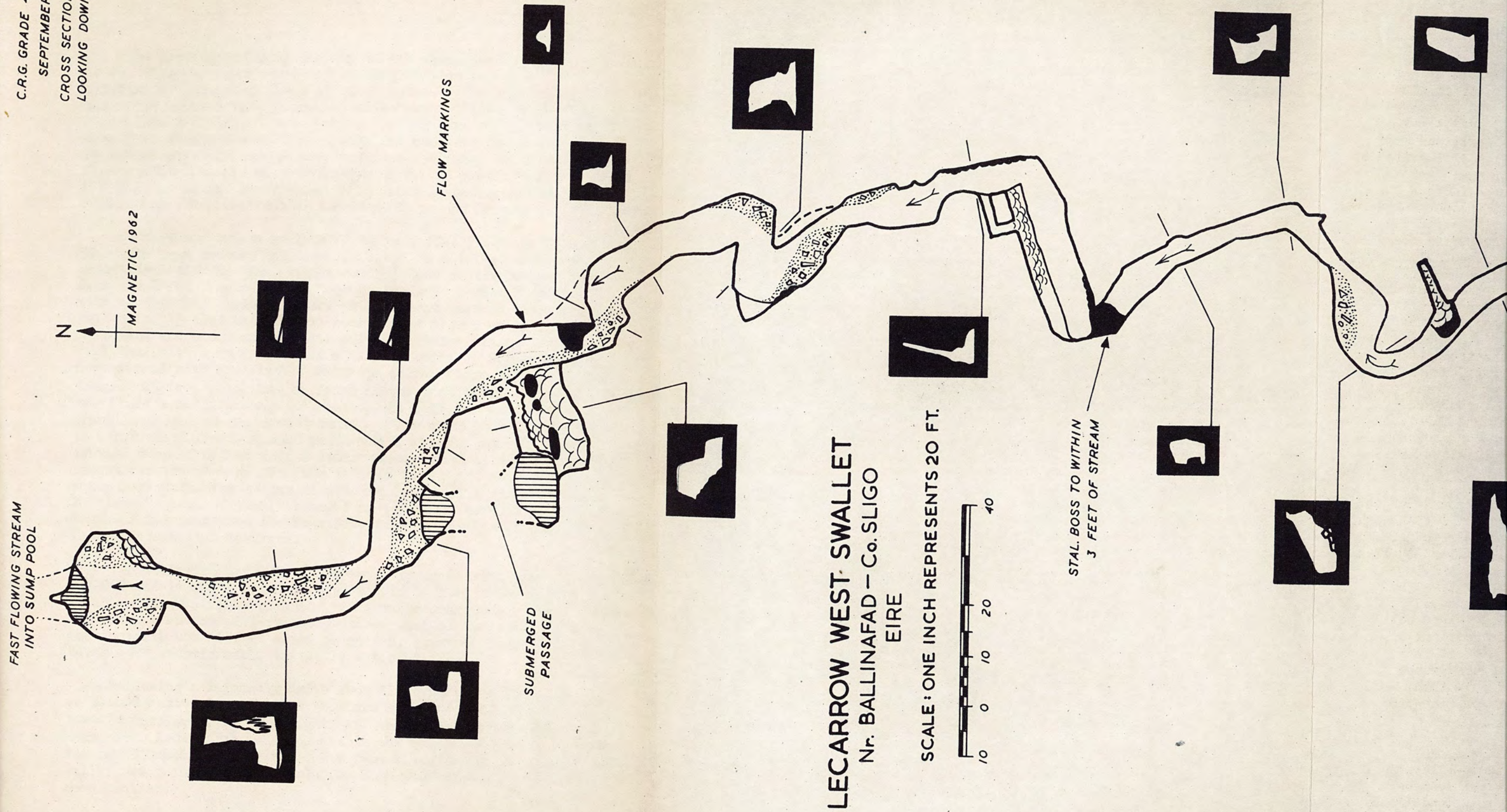
SCALE: ONE INCH REPRESENTS 20 FT.



STAL. BOSS TO WITHIN
3 FEET OF STREAM

STREAM ENTERS SWALLET
FROM SMALL VEE-SHAPED VALLEY

SURVEYED BY: A.J. KNIBBS
J. GIBB
C.R.G. GRADE 4 PLAN
SEPTEMBER 1962
CROSS SECTIONS TAKEN
LOOKING DOWNSTREAM



The devotion of only one day to the Geeragh-Tap area in Co. Sligo was not really in keeping with either the existing or potential caves of this region. The 1961 party had noted several cave entrances which are referred to in M.C.G. Journal No.3 (1962). With such a limited time we could do no more than choose the most promising and hope for the best. As it turned out the cave chosen, quite unwittingly, was Carrowmore Cavern already dealt with at length in C.R.G. Newsletter Nos. 66/67 (1959), and in the Leeds University Union Speleological Society Publication "Explorations in Counties Sligo and Leitrim - 1959-1960".

Carrowmore Cavern is located at ref. 12.67/1.40 on O.S. Sheet 55. The cave opens from a debris slope in a large, elongated shakehole - 200' by 50' - and about 50' deep at its deepest point. From the First Chamber a low passage leads to a second chamber with an unstable boulder floor. A rift continues on with two short pitches of 15 feet and 30 feet over jammed blocks until the roof descends, and progress is continued along a low passage about 250 feet long with a muddy pool at a halfway point. Bridge Hall is now reached with a choice of descents to the floor below; A free-hanging 25 foot pitch can be found on the left of the bridge. From the floor a muddy passage ascends to the left and two clean-washed crawls continue at the lowest point. The right hand crawl leads to a series of chert-studded rifts and a winding passage to an awkward drop of 8 feet into a lower passage with a stream entering. Downstream the passage descends rapidly to a point where, after a sharp left turn, the stream disappears down a rift about 15' to 20' deep. Lack of tackle brought us to a halt here at an estimated depth of 270 feet from the moor level and rather less than 1,000 feet in horizontal distance.

The estimated depth does not entirely agree with that of L.U.U.S.S. in 1960 and it seems possible that we did in fact reach a lower point. The weather during our visit was comparatively dry. This must have been indeed fortunate because much of the lower system, particularly the rift at which we halted, gave the impression of being most uncomfortable in really wet conditions.

Following a leisurely drive from Sligo north to Bundoran we turned eastwards along the southern shore of Lough Melvin towards Rossinver. Turning right, off the main road before Rossinver, brought us to Aghnahaha in the Glenaniff Valley. From the small hamlet we took the dusty road along the south side of the valley and turned south towards the high moor at the first good road available.

Walking westwards from the road and following a fence soon brought us to a very interesting dry swallet needing excavation. A local shepherd gave us some general information about deep pots lying further to the south west in the direction of Crockaveela (1408 feet) and we lost no time in following his directions. Isolated clumps of trees in the centre of slightly concave 'moss' several hundred yards across indicated the location of the pots. The two pots themselves had a strong Yorkshire flavour and demanded more equipment than was at that time available.

Set aside from the two potholes and a little further north is a large active swallet entrance with several trees within the 50 feet diameter depression forming the entrance. Examination showed the depression to be some 30 feet deep with a choice of two passages continuing; one taking the stream. A limited exploration was carried out showing both passages to narrow down disappointingly.

A return was made to examine one of the pots on the following day. For one of these the shepherd had mentioned a depth of 150 feet. Accordingly we took enough tackle to exceed this figure and selected the deepest looking shaft. The southernmost pot was chosen and a scramble down 20 feet or so brought us to a good take-off position with the ladder belayed back to large boulders. A descent of the first 40 feet arrived at a change in the variety of rock which suddenly became lighter in colour and closely jointed. Also at about this depth the stream, entering from the south end of the rift, made its presence felt. The pitch terminated in a huge pile of boulders and was just short of 155 feet deep. No way on could be found amongst the boulders and the stream sank inconspicuously amongst rocks and pebbles. The total depth was estimated at 185 feet. The second pot, the edges hung with ferns and creeper, was not descended - a feast at the central Hotel Manorhamilton, being imminent. The bottom of this second pot could be vaguely discerned as large boulders and appeared slightly less deep than the first. A good map reference is difficult to arrive at but the two pots were approximately at ref. 22.20/5.70 on O.S. sheet 43.

A brief visit was made to County Fermanagh where we launched the rubber dinghy in the Marble Arch Cave resurgence. Proceeding with difficulty under the low roof at the entrance we entered a large chamber with a deep lake. A continuing rift looked promising but was too narrow for the dinghy and seemed more a case for water wings.

In County Cavan, 2 miles west of Blacklion and on the north side of the road to Manorhamilton, is the White Fathers College. References to St. Augustines Cave, running below (and best entered from) the college grounds, may be found in the Craven Pothole Club Journal Vol.2., No.2 (M.Wynn) p.94 and also in a record of student activities at the college itself where permission to explore should be obtained. The college records include a rough survey of the cave by Dr. P. Leedal, an ex-member of the Bradford Pothole Club, and several interesting photographs.

The cave runs very close to the surface throughout its length and a short unroofed stretch divides the cave into an upstream section 300 feet long and a larger downstream section of about 1100 ft. Proceeding upstream the cave is occupied for its entire width, varying between 10 and 20 ft., by the stream and is negotiated by ankle-deep paddling along the slightly twisting passage with good headroom of about 8 ft. or so until one emerges into daylight and a narrow valley.

Downstream the cave opens into a wide chamber, narrows down at a thigh-deep pool, then opens out into a larger bedding chamber with abundant and interesting calcite formations. During our visit a colony of bats numbering about 100 was occupying a small dome in the roof of this chamber. Rising to a height of some 25 ft. and varying between 5 and 12 ft. wide the passage continues with the stream flowing swiftly over a bare scalloped limestone bed. After passing several pools and changing direction occasionally we eventually arrived at the beginning of a section of deep water. Taking to the rubber dinghy at this point one proceeds along an almost straight canal between 5 and 8 ft. wide with the roof 15 ft. above and 6 or more feet of water below. After about 500 ft. a bedding chamber, 40 ft. wide and 5 ft. high above water, is reached and daylight is seen at a low opening over tumbled boulders and hanging foliage. From this point the stream continues in daylight to run into Upper Lough Macnean.

Including the unroofed section the cave is around 1500 ft. in length but contains no vertical drops; the vertical interval between sink and resurgence would seem approximately 30 ft. The prospects for both photographers and surveyors is very bright indeed for not only has the cave some very interesting and beautiful stretches but these may all be appreciated in comparative comfort. The very warm welcome extended to us by the college personnel, which included showerbaths, changing rooms, and a splendid high tea, set a new standard of five star comfort to the day's caving.

Indeed the whole fortnight passed in an atmosphere of friendly welcome and cordiality (or "guinnessality" depending on the time of day). Although there was nothing particularly remarkable in our achievements there was surely sown the seed of interest and anticipation for future caving in Ireland.

THE COTTAGE

Although not a 'caving' topic, this short contribution to the journal is necessary as a permanent record of the building of the Mendip Caving Group cottage at Stirrup Cup, Nordrach. Our eviction from the old cottage in the upper reaches of Blackmoor, was indeed a sad occasion in the history of the Club, but it imparted a sense of unity in striving to provide a new headquarters on Mendip.

After much consideration we decided to invest our hard saved Cottage Purchase Fund in an ex-army wooden barrack hut which we dismantled on Salisbury Plain, and which Jim Fry transported to the Stirrup Cup in one of his ever-adaptable cattle trucks. Most weekends of summer 1964 saw small bands of scruffy M.C.G. campers wielding hammers, saws, mixing concrete and applying sloshings of creosote. By the autumn we had the roof on and it was sort of habitable, although our furnishings consisted only of orange boxes and planks of wood. For the October General Meeting a table was especially imported from Jim's barn.

Since the cottage became fully operational the number of members and guests staying there has increased to such an extent that on numerous occasions all twenty-seven beds have been occupied. A further six beds are now planned. The recently constructed front porch, which serves as a changing room has made caving more convenient and the amount of caving in the club has increased greatly during the past couple of years.

Now, although there are numerous improvements and additions still to be made, it is undoubtedly the most efficient cottage on Mendip, and one of which we can be justly proud.

THE FOUNDING OF M.C.G.

THE EARLY YEARS

by
M.O. Cotter

More than ten years have passed since the early days of the Mendip Caving Group and I feel it would be interesting for many of you if I cast my mind back and relate how the whole thing started.

My initiation into caving was in Devon, and began after a tourist trip to Kents Cavern in 1948. National Service took me near Yorkshire, where the pursuit was followed. Caving standards especially in the north seemed low, and as a critic, I was told that I really ought to start a new club.

A posting brought me within striking distance of Mendip and plans were soon made for a trip there. My first partner was Dillan Evans, who had been into several caves in Wales. I well remember that first trip. Our coach arrived at Bristol and from thence we took a bus to Wells. So slowly did the bus move in low gear, that I imagined us climbing to high altitude on Mendip Mountain. Fortunately, we reached Wells in time to catch one of the only buses in the week to Priddy. We asked the conductor to put us off at Main's barn. When we were told that our destination was reached, we alighted. The conductor pointed ahead, saying that Main's barn was there but we could see nothing. With the departure of the bus it seemed that all contact with civilisation had gone, so we hurried forward in silence. We fortunately found the barn and were made welcome by Mr Main, to whom I had written a letter, which he remembered. The time was 8.30 pm. on the 14th of November 1953. Milk and eggs were obtained and a quick meal swallowed.

We heard that a party from Sandhurst were going down Swildons and being few in number, they let us join them. An enjoyable trip to the sump followed. Between this trip and the next one on 17th of January 1954, two further supporters were gained - Tony Windale and Dennis Hemmings; neither of them had been caving before. The idea of a club had been suggested to them with the name Mendip Caving Group - without rules apart from safety precautions, which the others accepted from me without question.

Everything went well so that by the end of the weekend, Mendip Caving Group was accepted between us. There was no inaugural meeting. A further trip was made at the end of the month, when we had our first contact with another club and were locked in Swildons all night. By February our membership was eight, three of whom had not been to Mendip and two I had never met, being friends of Dennis. Inactivity on the part of other clubs at that time of the year helped us for there was no thought of joining them instead at the time. Indeed, B.E.C. and Wessex were the only ones we knew to exist. We were looking for a headquarters by the end of January.

Our first meeting was held on 4th February and was attended by 4 members. Subscriptions were fixed at 2/- per week, a larger amount of money on an annual basis than we anticipated. Collecting went on for a further six weeks, by which time people had joined who could not be seen too regularly. Another point was that 2/- was rather a lot so we fixed subscriptions at 12/- per year.

Dennis, renowned for his success with women, got one of his admirers to join the club in name and produce a newsletter, which we had in February. On the 26th February, we held our first club meeting of an organised nature, when there were three of us down. Then came Easter meeting which finally set us on the path of an active independent club with experienced supporters and some dynamic members.

My journey to Mendip was alone, for the others from camp had been posted elsewhere. Being poor and without transport, we always walked from Hillgrove to Priddy, with enormous packs. I had just passed the "Hunters", when a motorcycle came up noisily from behind and stopped a little way from me. The rider said something to me but I was unable to catch much. He had been awaiting a friend at the B.E.C. hut but after some hours, since it was very cold, decided to look for him. He asked if I was the fellow, I think.

When I gave a negative reply, he asked if I wanted to go to the barn, since he had decided to sleep there, the time being about 11 pm. What a thankful lift that was, after walking over 2½ miles. My chauffeur sped me to the barn in a matter of minutes to save me a back-straining last half hour. That night we messed together and what a mess it was! Our sausages were dropped on the floor but since we were so hungry we put them back in the fat to sterilize. It was obvious to one another that we were both enthusiastic and sticklers for technique, so that in a short time a firm bond of friendship was established.

First thing next morning my new companion Tony Crawford took me over to the B.E.C. Hut and there had a few words with Don Coase,

asking if he could take me down newly discovered Outhberts. He was refused. Thus, I missed the chance of caving with another club and Tony was put out enough to join me for the rest of the weekend. Had it been otherwise, the course of history could have been quite different. It was possible that a trip with enthusiastic cavers in a new cave could have induced me to join the club, taking the other M.C.G. members. As it was, we were definitely alone, Tony acting as the complimentary part to myself, since he was a clever engineer, with many years experience. When any question of equipment came up, personal or otherwise, we always agreed in principle. I mention this incident in reasonable detail now, although at the time it seemed to have little significance.

Later that day, Dennis turned up with Geoff Wingrove and Mike Burbage. That evening, lying in the hay, we all chatted about the caves we were going to discover and the explosive we would use to pass any obstacle. Our enthusiasm fell to the ears of another person sharing our loft; that was Tony Knibbs. Next day we all went to a possible dig, Dennis and I had spotted in Velvet Bottom and camped nearby. The early hours of this dig were so exciting, that we familiarised ourselves with one another and were soon an inseparable team. The two Tonys were enrolled into the group, before the weekend was out.

Little was done in the field between Easter and Whitsun but paperwork got well underway and a rope ladder of 25' was constructed. In 1954 one more notable member was gained in the form of Don Searle. The first meeting was underground in Godstone mines, Kent. We were in two separate parties, unaware of one another groping about in the maze of tunnels, when each party heard the other. Don who at the time thought it was the police after him for trespassing, gave way to enthusiasm for exploration. By August 1954, Tony Crawford had constructed our first 'electron' ladder, which was at once put on trial. In these early days, we camped in Velvet Bottom by the rain gauge or on Piney Sleight for privacy. Membership expanded so much so that by Easter 1955, 18 people camped on Piney Sleight. Out of these 18 only 3 - Don, Tony Crawford and I, remain as members. Even so, the importance of our company at that time cannot be understated, because everyone was enthusiastic, assuming the bonds of caving together would never be broken. Without the annual, the hardy perennial would have become dispirited and the cause lost. How many with us to-day will also drop, to leave the soil more fertile for those that follow. Anyway back to history. The Easter meeting proved a trying one, since one of our party had an accident in Longwood. Fortunately, it was only a sprained ankle but the group received criticism from persons and

clubs with much worse records of disasters to their discredit. Even so, our organisation prospered and became an independent force. Wisely, we kept to ourselves and the main politics were internal. Towards the end of the year, a split developed between the early inexperienced members and the early experienced ones. The struggle for control ended, when two factions broke away, and disappeared from Mendip. The necessity for a constitution and rules was realised and the committee, now elected, drew up a set.

A great emphasis was put on safety and good technique, to anyone who joined the group. First trips underground were usually for training. Several years work on our dig in Velvet Bottom (Timber Hole) was done, and only flagged when our camp site was given up in favour of Nether Wood Cottage.

The Cottage changed us to some extent, some think to disadvantage, but I think otherwise, because we had more time to dig and were less bothered by weather. With the cottage we arrived at a time that many can remember and there is no need for me to carry on.

Thus the course was set and by friends being introduced and the occasional lecture or newscast, membership gradually increased to its present level. Occasionally a ripple broke the wave but it gathered itself again in greater force.

CHEDER HOLE

by

C.F.Reynolds, Ph.D.

One of the four wonders of England is at "Cheder Hole", where is a cavity under the earth, which though many have often entered and there traversed great spaces of land, and rivers, they could yet never come to the end".

The above description is given in "Historia Anglorum", 1125-1130, by Henry of Huntingdon. A more detailed description is given in the 16th century "Description of Britaine" by Holinshed:-

"The third is an ample and large hole under the ground, which some call Carcer Aeoli, but in English, Cheddar Hole, whereinto

many men have entered and walked verrie farre. Howbeit as the passage is large and nothing noisome, so divers that have ventured to go into the same could never as yet find the end of that waie, neither see anie other thing than pretie riverets and streames which they often crossed as they went from place to place".

"This Cheddar Hole or Cheddar rocks is in Summersetshire and thence the said waters run till they meet with second Ax that riseth in Owkie Hole".

While neither of these authors claim to have visited it there seems little doubt that a fair sized cavern could be entered during the Middle Ages. None of the caves at present known fit the description and Balch, in "Mendip - Cheddar, Its Gorge and Caves" suggests that Cooper's Hole could be the remains of the entrance. Over the last few years the Mendip Caving Group have been digging in this entrance in an attempt to discover new passages and the following notes discuss observations made during this period.

The Deposits of Cooper's Hole

The results of an excavation in the entrance by R.F. Parry in 1931-32 are described by Balch (loc cit) and the author has described some deposits deep in the cave in the Mendip Caving Group Journal, No 3, (1962). The deposits so far recorded fall into the following levels:-

1. Recent debris and clay
2. A yellow highly stratified clay containing layers of charcoal.
3. Bluish clay, containing some early iron age pottery, animal bones, and stones.
4. Red clay.
5. Stalagmite floor, several inches thick in places.
- 6 & 7 A Layer of angular stones in clay or clayey sand containing a number of bones including horse.
- 8 Sandy clay.

9. Alternating layers of fine gravel and sand.

The thickness of these deposits probably varies widely. In Parry's excavation Levels 1 and 2 were about 5 feet thick, while at the eastern side of the entrance they were at least 10 feet thick and possibly more. The same is believed to apply to the lower levels. It should be noted that at no time has bed rock been reached.

During the excavations a side passage was discovered. When first found its entrance was choked with material from Level 2 and steps were found cut in the stalagmite flow which blocked it. This has now been removed and several chambers (not previously entered) have been found.

The History of Cheddar Gorge

The history of Cooper's Hole can only be considered in terms of the Gorge, in which it lies, and this in turn can only be considered in terms of the past and present drainage patterns of the area.

In a number of swallet caves in the area, in particular Longwood/August Hole, and G.B. Cave there is evidence of a period of major activity, followed by another in which a boulder infilling was covered by calcite. Under present conditions this infilling is being removed in many parts of the caves, and detour routes have been made elsewhere. This suggests that the drainage pattern has changed from subterranean to surface and then back again, and this may have been caused by the swallets becoming choked with debris and silt. Under these circumstances rain water would have had to find another route to the sea and the Velvet Bottom/Cheddar Gorge valley system is of the kind expected of such a river. However once the surface water was recaptured by the swallets the river would only be active in times of flood, and the frequency of these would decrease as time went by. With no more water flowing down the gorge the bottom will have become choked with blocks falling from the high cliffs and it seems likely that the gorge was once deeper than it is now. More recently the mining activities on the summit of Mendip caused the silting up of some of the swallets and major floods again flowed down the gorge, carrying with them large quantities of charcoal.

The History of Cooper's Hole

Cooper's Hole is the remnant of a large chamber or passage,

some 20 feet high and 40 feet wide which originally lay beneath the bottom of the gorge. The lowest levels discovered may have formed during this period. Next the stream flowing down the gorge would have breached the roof of the cave, bringing in large quantities of angular boulders and other debris. Levels 6 and 7 almost certainly were laid down at this stage. At the far end of the first tunnel excavated the bones of a horse were found jammed against the roof, and the mixture of angular stones and silty materials is not that expected from normal stream deposits.

For a time the river may have flowed through the cave, but later it flowed down the gorge, leaving Cooper's Hole as a large opening above water level. The stalagmite floor (Level 5) probably dates from this period. Next rock falls into the now dry river bed raised its level to that of the cave entrance and Levels 3 and 4 were formed. In the west corner of the entrance a scree slope was uncovered when the retaining wall was built and this was definitely covered in part by Level 2 and is probably the same age as Level 3.

We now reached the crucial period. Prior to the deposition of Level 2 the cave entrance would have been some 30 feet wide and varying from 5 feet to 12-15 feet in height across its width. Just inside the entrance there would have been the then open passage in the left hand wall, and further down the main passage ---??? If it can be assumed that the main charcoal deposits are derived from mining activity during and after the Middle Ages it is clear that the exciting conditions described above will have existed in the 12th century and for some time afterwards. Later the entrance became choked by the silt and charcoal from the mining activities.

What Lies Beyond?

From the evidence of the deposits it seems highly likely that at the beginning of the millennium Cooper's Hole had an imposing entrance. The deposits themselves do not indicate whether the cave was then 50 or 1000 feet long. However, as there is no evidence of any other major cave entrance in the area at that time it seems extremely likely that Cooper's Hole is in fact Cheder Hole and that the first of the alternatives is not the case. This means that if all the deposits of Level 2 were removed the inner reaches of Cheder Hole could not escape discovery. Any attempts to extend the cave by tunnelling in deposits older than Level 2 would be much less likely to succeed.

The accounts of Cheder Hole are not very explicit about the size but it seems unlikely to have been much less than 500 or 1000 feet. It is possible that it is a completely unknown cave, but as the passage runs south towards Gough's Cave, some 300 feet away it may instead have connected with this. If so it probably joined up somewhere between the Oxbow and the Pixie Forest, and the total length of passages would have been some 800 feet plus side passages. This may well have been considered unending by mediaeval spelacologists. Whichever of these possibilities is correct there is little doubt that further excavation in Level 2 is likely to lead to an extension of the cave, and possibly to more definite proof that Cooper's Hole should correctly be called Cheder Hole.

Some Notes On Limestones

By

Joan Robinson

Limestones are a polygenetic group of rocks, some being fragmental or detrital sediments which have been mechanically transported and deposited; others are of chemical or biochemical origin and were lithified or consolidated in situ. To add to difficulties in establishing their origins they may be profoundly modified by post-depositional changes.

Because limestones are composed mainly of calcite they have a high CaO and CO_2 content - up to 95% in pure limestone. MgO sometimes occurs in large enough quantities to become a major constituent, MgO being interchangeable with CaO in the $(\text{Ca}, \text{Mg}) \text{CO}_3$ (calcite - aragonite - dolomite) mineral system. The amount of MgO in limestone may in some way reflect the compositions of the organisms from which the limestone was formed. Some algae, for example, contain more MgO in their shell structure than do molluscs, and aragonitic animal shells are more magnesium rich than calcite ones. A further complication is that MgO seems to be particularly prone to movement within the sediment after its original deposition.

A commonly found constituent of some limestones is silica, which occurs as Chalcedony (SiO_2). It is usually segregated into nodules of varying sizes ($\frac{1}{8}$ " - 6") which are known as flints when occurring in chalk rock, and as chert when in Carboniferous Limestone.

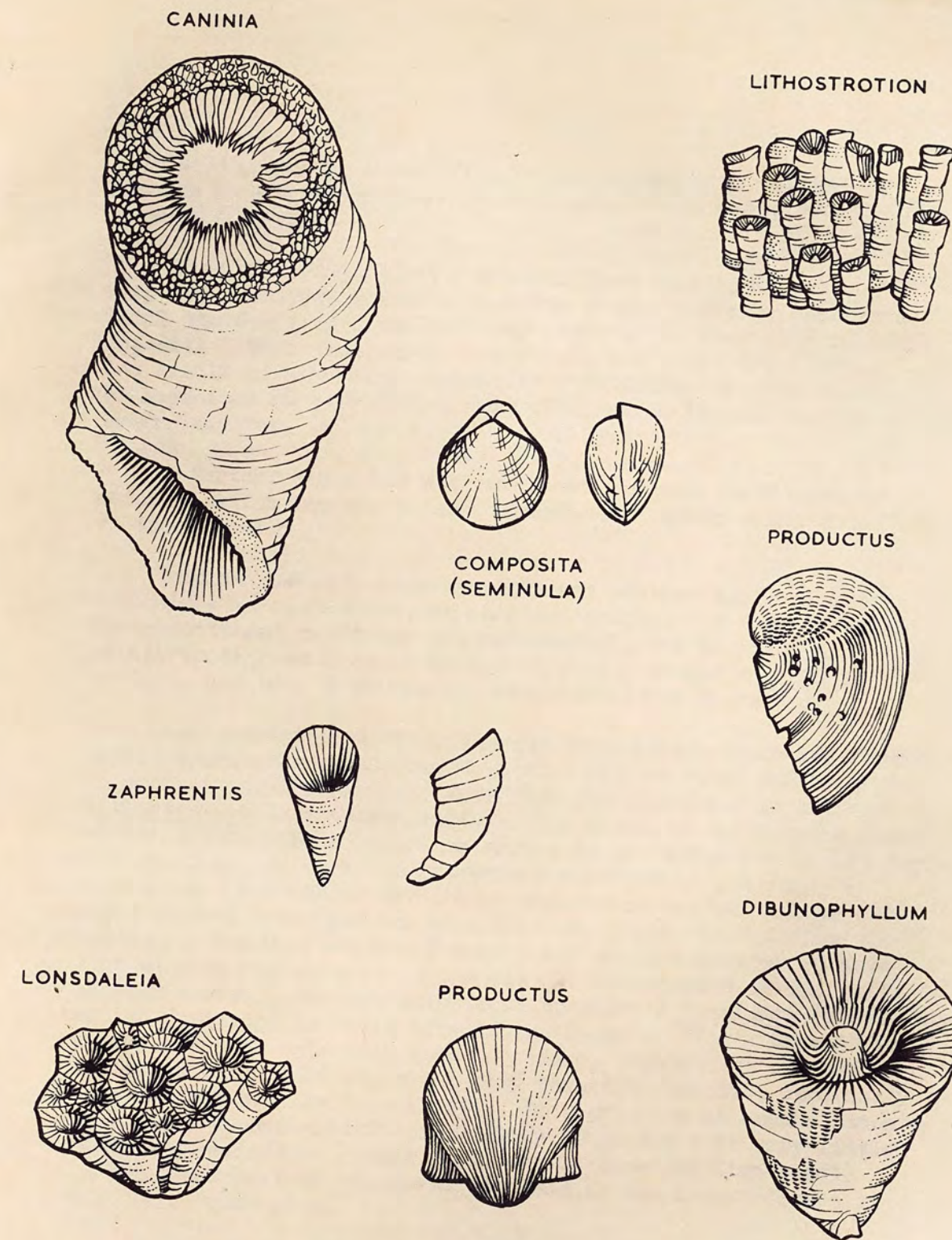


FIG. 9
COMMON FOSSILS FROM
CARBONIFEROUS LIMESTONE

This silica may be formed from, or associated with, siliceous organic remains—many chalk flints, when broken open, reveal well-preserved sponges.

Clay mineral particles occur in less pure limestones. They are finely dispersed within the matrix and pass unnoticed until the CaCO_3 is dissolved away leaving the clay as a residual deposit. When iron oxide is present, red clays are formed. One result of high clay content is that an impermeable layer may be deposited on cave floors and walls, which impedes further solution by groundwater.

A further minor but noticeable constituent is bituminous material which imparts a dark, almost blue colour and a fetid odour to the limestone.

Texture and structure can indicate whether the sediment is essentially of mechanical, or chemical origin. A rock in which the constituent particles are well-sorted, and in which cross-stratification or current bedding within a single stratum is evident, has been mechanically transported and deposited.

Characteristic of biochemically formed limestones are fossilised coral, algal or stromatoporoid reefs — all of which can be seen in much of the Devonian and Carboniferous Limestone of Britain. Lithostrotion is a common reef-forming coral in the S and C zones of the Carboniferous Limestone series in the Bristol — Mendip region. The existence of reefs in limestones immediately suggests, by comparison with modern ones, that deposition was in shallow (20–25 fathoms), warm (greater than 18.5°C), light, CaCO_3 -rich waters. Coquinas — banks of shells and shell-debris which have been winnowed by currents — can also be recognised in the walls of many caves. The commonly found brachiopod Composita (previously called Seminula) is indicative of the S-zone. "Petit Granit" is a name given to extremely coarse-grained, crystalline crinoidal limestone because of its similarity to a true granite, especially when stained pink by iron oxide. It represents an accumulation of current-washed crinoid or sea-lily fragments with very little admixed fine-grained matrix. It can be seen (so I've read!) in the upper part of the Z-zone exposed in the lower reaches of West Twin Burrington.

Fine-grained carbonate rock, popularly known as "Chinastone", occurs throughout the Carboniferous Limestone of the Mendip region, and indicates shallow, lagoonal conditions of deposition. It is pale-grey to white in colour when weathered but black when freshly

broken, and fractures conchoidally. It is essentially chemically precipitated, but there is controversy as to the exact mechanism by which this is effected. At present, similar carbonate sediments are forming in shallow water of approximately 6 fathoms on the Bahama Banks and some conclusions have been reached there; the carbonate muds are formed of minute aragonite needles, but during lithification (induration of the rock) these change to calcite which is the more stable form of CaCO_3 . One opinion is that CaCO_3 is precipitated from sea-water as a result of oversaturation due to daily warming and evaporation. A second theory is that bacterial metabolism results in changes in the chemistry of sea-water which enables precipitation to occur. Algal precipitation of CaCO_3 has also been suggested.

Many shallow-water limestones contain small spheroidal grains of approximately 0.5 mm. diameter formed of concentric layers of CaCO_3 ; such spheroids are called 'oolites'. When up to 0.5 mm diameter they are called 'pisolites'. The concentric lamellae have been formed by rhythmic precipitation upon a nucleus which may be a shell-fragment, quartz grain, or similar object. Current agitation, and therefore shallow water, are necessary for oolite formation. Cave pearls are thought by some people to have origination in a similar way.

To sum up, the conditions necessary for limestone deposition - and prevalent in Southern Britain in Lower Carboniferous times - are warm, shallow waters saturated with CaCO_3 . Consequently present day carbonate deposition is concentrated between 30 N. and 30 S. Rock magnetism data indicates a carboniferous north pole at 50 N. and 140 E., which would result in Britain occupying a position well within the tropics. This would explain the great thickness of Carboniferous limestone. One of many theories to explain the absence of widespread modern calcareous sedimentation is that the present undersaturation of ocean water is due to addition of cold water during the ice age. At this rate cavers in a million or so years to come will have to hunt even harder than M.C.G. for their caves!

BLACKMOOR SWALLET: 1962 DISCOVERY

by

Malcolm Cotter

Previous work on Blackmoor Swallet has been described in M.C.G. Journal No. 3. I will recount here some details of work carried out in this area since 1960. The first of several points of attack was the upper swallet. A thirty foot long tunnel was excavated reaching a depth of 12 feet below the point of water entry. This ended at an aven with dangerously

poised rocks overhead. The stream apparently sank in a mass of rocks at the bottom of this aven and it was possible to detect a cold air current emerging from the loose rocks. From the upper part of the aven a passage appeared to continue forward. Our next efforts were directed at an attempt to enter the aven from the surface. This task involved sinking a shaft about four feet square, but was plagued with subsidence.

Throughout the duration of these two digs, intermittent work had been going on in a nearby depression situated to the south of the swallet entrance. From its appearance we did not know whether this was a shakehole or a gruff. Work was concentrated at this point once the other two sites were abandoned.

During one session, at which I was not present, a party which included Don Searle and Geoff Davies cleared a way into a cleft with an outward air current. Further progress was impeded by a large rock. The following weekend I returned with a party comprising Geoff Davies, Ann Gibb, George Savage and Dave Judson. It was obvious that blasting was required, and when the debris was removed we realised that a further set of charges would save a lot of laborious work. There was now plenty of broken rock to be cleared but we left its removal until the following day. Next day we continued; soon Geoff was excitedly telling us he could see into a large chamber although Dave and I were not immediately impressed.

At this point it was my shift. After sending up a few buckets of mud and a lot of rocks it was possible to prise out three large rocks. It appeared that the way widened out into a chamber. With the removal of a few stones I thought it was possible to pass onwards. The gap was a very tight squeeze and, descending feet first, I soon became aware that my feet and back no longer scraped the roof. On turning round I was amazed to find my-self in a chamber some 15 ft. across with several ways leading off. In the floor on the left was a semi-circular hole about 6 ft. deep with a neat wall of mining "deads" holding back the scree slope on which I stood. Geoff and Dave now came down to join me. We broke through at about 2.30pm., and it was now time to go out and tell the surface party of the discovery.

George and I returned to the cottage to put a notice on the board and collect some gear. When we return the squeeze had been greatly enlarged, and Geoff and Dave were moving rocks to enter a lower passage. Whilst this was in progress the remainder of us examined the rest of the cave. In the chamber we noticed several "run-ins", apparently from the surface which was only 20 ft. above. There were signs of mining in the form of old pit props although the chamber was natural. The last rocks were removed from the mouth of the lower passage and Geoff was

able to drop down a 10 foot chimney into a dry stream passage which turned out to be disappointingly short. The passage was well water-worn and contained two short stalagmites and a mine timber in excellent condition. A mud and rock fill in this lower passage was attacked but offered no obvious way on.

Two weeks later Geoff Davies, Don Searle, Simon Knight and I decided to attack a blocked passage, near to the entrance, which ran beneath the actual entrance fill. Progress again required blasting a large rock and, after removing the debris yet another rock was found to be blocking a vertical rift. Preparation for blasting this rock was filmed, which I think makes an interesting record of the work here. The following day Dave Mitchell and Alan Cowley went to work and entered a narrow rift which did not go very far. A lot of clearance was done in this rift but work stopped when a rock which appeared to be securely wedged fell down a moment after I had been underneath it. This is the nearest I have ever been to a fatal accident.

After this incident work was resumed at the lowest point in the cave, the dry stream passage. One wall is of limestone and the other wall appears to be of red sandstone. This peculiar feature may be due to the Triassic infilling of a natural rift in the limestone. An advantage of the sandstone is that it is easy to drill. Blasting went on most weekends until a hole eight feet deep had been made. From this point it is possible to look down into a narrow transverse rift only about five inches wide. When working here one day I found some straw sticking to the wall of the rift. Work in this area has been greatly hindered as there is nowhere to dispose of the spoil.

While work progressed at a lower level, Don Searle began digging with a garden hoe at a point in the entrance chamber between the solid wall and the entrance fill on the south side of the chamber. Towards the end of his second session he was rewarded by breaking through into a small chamber with some stal in it and with a roof of jammed boulders. A narrow rift and a hole in the floor at the far end of the chamber offered hope of progress.

Location: N.G.R: ST/5055.5550
Altitude: 780 ft. O.D.

Surveyed Information (to 1962) Grade 5 C.R.G.

Total length: 150 feet (not including 30' dug in Swallet Passage).
Total depth: 71.6 feet
Grading: Moderate.

BLACKMOOR SWALLET: OPERATIONS SINCE 1962

by
Tony Knibbs

With the departure of Malcom Cotter for Singapore, work on Blackmoor Swallet lost impetus. My own interest in the project was only aroused on the completion of work in Pinetree Pot and Ubley Hill Pot. Throughout January 1963 the entrance shaft to the newly discovered chamber was filled with snow. A blowhole measuring six feet long and one foot wide was observed (gratefully!) at this point whilst another small circular blowhole was noticed close to a leat which discharges, in very wet weather, into the lower sink in the floor of Velvet Bottom. The actual Blackmoor Swallet sink showed only superficial blowholes and the subsiding shaft above it showed no air disturbance. When the snows finally melted in March the resultant floods played havoc with the spoil packed upstream in the Lower Rift dig. This was eventually sorted out and some temporary shoring put into position to prevent a repeat performance. Work proceeded until supporters and spoil storage space finally petered out; the net gain was only three feet of depth. Whilst there may, indeed, be a shred of hope for a successful dig here the problems to be surmounted are very considerable if work is to be carried out safely.

Later in 1963 Don Searle and I visited Don's Chamber on the south side of the entrance shaft, and it was entered by a crawl against the shaft debris fill. The chamber was examined closely and a tiny streamlet was found. A solid rock face on the west side of the chamber showed a promising undercut too low to see into and it was mutually agreed that a way on should result from a determined dig here. As one wall and much of the roof consisted of the bottom of the shaft fill, the pursuit of work required the entrance shaft to be emptied of all the fill. The cottage-building during 1964 put off further work on Blackmoor until mid-1965.

In July 1965 we decided to remove all the fill from the entrance shaft with a view to working down-dip from Don's Chamber. The following support was gratifying since the shaft measured 9ft. x 10ft. and an estimated 25ft. of fill had to be removed - some 80 cu. yds. of boulders and clay fill. On reaching a depth of 12 feet a lifting tackle was installed. This consisted of two eleven foot lengths of 2.375 in. galvanised iron water pipe; one standing vertically and sunk 3 ft. into the ground whilst the other was rigged as a swinging jib supported on the vertical member at 45° by a Y-piece of welded pipe, 2.5 in. inside diameter. The majority of stress was taken through three wire rope guys from the vertical member to the ground and a single wire rope from

the vertical member to the jib. This arrangement worked well and was further improved by the replacement of slave labour by a 5 cwt. petrol driven hoist. A wheelbarrow was acquired which enabled us to extend the spoil tip several yards down Velvet Bottom.

As the shaft fill was removed it was seen that a narrow natural rift had been enlarged by blasting to form the large shaft. Several items were found which indicated the presence of miners; an iron stemple, shoring timbers, a clay pipe (filled with tobacco!), and an all-leather boot sole. Odd pieces of galena were also discovered. Exactly why the original rift had been enlarged is still a puzzle. Maybe a lead vein was worked here, or perhaps this was part of a scheme to reach and remove obstructions from the actual water sink. During work at the sink several shot holes were found in positions which could only suggest tunnelling upstream from the known chamber. The refilling of the shaft is most unlike usual lead mining procedure. A "beautiful cavern" was allegedly discovered during mining at Blackmoor and it is just possible that some mine owner was preservation conscious and ordered the refilling as protection. Commercially an unlikely story I'm afraid. The mystery remains.

Today (October, 1966) the depth of open shaft is 30 feet. Don's Chamber has been opened and emits an air current. The fill material is now changing from a boulders-and-clay matrix to cleanwashed blocks of limestone with occasional chunks of red sandstone. This clean lower fill appears to be mobile in one particular place and is slumping downwards under the west wall of the shaft. Overhead and down-dip from Don's Chamber is a calcite-cemented boulder ruckle which is somewhat suggestive of fault breccia. Examination may indicate that the original rift is indeed a fault. The next issue of this Journal should make interesting reading for those anticipating more results from the work on Blackmoor Swallet.