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EDITORIAL

The penalty of producing a journal based on club results rather than club gossip is that the frequency of publication will depend on the energy and luck of the club at any given time. Once more, sufficient material has assembled to warrant going to "press" and we can only regret the information available but not yet written which must, therefore, wait for a later volume when it can appear as more outdated material.

It was with deep regret and a sense of personal loss that we heard of the death of Jack Waddon who had often worked with members of the Club and we extend our sympathy to his widow and family. At the same time we feel privileged to be able to fulfil his request to publish the full reports of his last diving operations in Yorkshire and hope that his good work will not be wasted but carried on to fulfilment.

Ken Ashton.

LOW DOUK CAVE, IREBY FELL

R. Hart

The excavation leading to the discovery of Low Douk Cave was begun during Easter, 1961. The large cave entrance lies at the lower end of the same field as Marble Steps Pot, and the small stream which enters the cave sinks among the glacial drift which forms its floor. Colin Green, Gordon Batty and Jeff Hart started to dig a shaft against the northern wall of the open cave in an attempt to follow what seemed to be a major point in the roof and wall. When I joined them some weeks later, this shaft had reached a considerable depth and was walled up against the infill, some of the spoil being used for a dam to keep out flood water. The major joint showed signs of becoming a horizontal cave passage, but alas this turned out to be rather small and still contained a lot of infill. Much effort was vainly expended on this passage by the original trio before the dig was temporarily abandoned in July, 1961.

Gordon and I returned to the dig in the snow of December, 1962, mainly because Low Douk was a dry dig near the road, but also because Gordon had a bright idea about it. His idea was to try to continue the shaft downwards instead of trying to force the horizontal passage. Our efforts in this direction met with some success when the removal of a large flat slab revealed a more-or-less vertical open shaft about fifteen feet deep, taking in a strong, very cold draught. This could not be descended immediately because of a constriction about halfway down. Some work with a hammer the following Saturday removed the constriction, but all that could be seen at the bottom was a slope a big black boulders. We concluded that the whole shaft was an oxbow, with the top end above the fill, the bottom end below. After scraping around in the bottom of the hole, we left, feeling on the whole, that things didn't look so good. However, Saturday 29th December saw us there again. Poking about in the bottom with a lump hammer, Gordon discovered that part of the wall was decidedly portable, and promptly portered it. He found that the draught was disappearing along a slope, between the wall and the boulders. Stones, thrown down this seemed to indicate considerable empty space beyond, and perhaps a pitch. Luckily, the boulders in this vicinity were not too large, and an hour or so's work with hammer and chisel made the gap just about man-size. Sliding down, we found ourselves standing at the bottom of a boulder slope in a large flat chamber, with a small stream emerging from a low bedding cave and vanishing into a narrow rift at the other side.

The exploration proper then began. We followed the stream along the rift passage, which was narrow and tortuous, and very high in some places. It frequently proved easier to traverse above the stream than to struggle along in the lower part of the rift. The passage was decorated with occasional small formations and numerous sharp projecting pieces of rock. Eventually, the rift emerged at the top of a short pitch in a large, high chamber. The pitch proved to be climbable (with care), and on the right at the bottom there was a heap of earth and boulders, which might conceal an inlet. The stream flows away to the left in a passage of roughly circular cross-section, having many gritstone boulders on the floor. This soon degenerated into a damp crawl lasting about fifty feet. The crawl opened out into a large rift passage, and a short distance along this we found a big aven with a small stream coming down it. There were a few possible climbs in the vicinity which might have revealed the source of this stream, but we ignored them and continued along the rift. This shortly split up into two smaller passages, with the stream following the right hand one down a short descent and into a sump. The left hand passage was dry and sandy, and went on for about a hundred feet before sloping steeply downwards into another sump. Both sumps seemed quite final, but we were still hopeful that we would find a continuation of the cave somewhere. We made our way out, not without some effort, to complete the first exploration of the cave in about three hours. The next weekend, we returned with Jeff for another look round. On the way in, our compass showed that the general direction taken by the cave was south west. By traversing over the top of

the pitch in "Steps Chamber", we entered a passage of good size: this went on for some distance and finally emerged at the top of a wide shaft about thirty feet deep. We were somewhat disappointed when closer inspection revealed that this was the top of the big aven up which we had looked the week before. Returning to the main passage, we went on to investigate the climbs which had noticed the previous week. These gave access to a sort of sloping ledge covered in sticky mud. Jeff tried hard to climb an aven where the mud seemed to be coming from, but without success. Gordon had better luck when he climbed into a small passage which crossed over the main rift and came out on the other side of the big aven again.

One other discovery was made; we climbed down into the stream to complete Jeff's conducted tour. After looking at the first sump, Jeff went along the sandy passage towards the second (on his hands and knees for some reason!). On the way, he found a small hole in the sand, which we had missed. This hole was draughting inwards, so there is presumably an airspace above the sump somewhere. A dig was started on the spot, and subsequently continued, but no way over the sump has been found yet.

The cave was surveyed some weeks later by Gordon Batty and Albert Wilson. A successful water test has yet to be done; the nearest sink, Marble Steps, has been tested to Keld Head in Kingsdale. However, the Ireby Fell Cavern is not very far away, and the stream here has been tested as far as Notts Pot, which is assumed to drain to Leck Beck Head. A successful test at Low Douk would serve to delineate the watershed between Kingsdale and Leck Beck. If it should turn out that Low Douk does in fact drain westward, this would point to the existence of a (possibly drowned) cave system crossing the whole of Ireby Fell and Leck Fell.

THE CAVE DIVING GROUP

Reports of diving carried out in Yorkshire

Magnetometer Pot, Fountains Fell. Feb/March 1961

Operation "Maggie 1" 19.2.61

Diver: E.J.Whaddon.

Styx Rising. This is some 300 yards from the entrance pitch, and is normally a static sump. In time of flood, water rises and flows up the steeply descending approach passage, rising up through a vertical distance of 70 ft. The cave is only accessible during periods of dry weather. On this occasion, only 3 supporters were available, and thus lightweight diving gear was taken into the cave. The breathing apparatus used was a modified D.S.E.A., oxygen being breathed on demand. The diving dress was a S.E.I.S.W.H. (Submarine Escape Immersion Suit with Hood). Lighting was by means of a 3-cell NiFe accumulator and cap lamp set. With A.Fincham holding the lifeline, the diver entered the sump. The passage sloped steeply at an angle of about 40°, with a shingle floor. The roof was irregular with pendants and hollows, the character of the passage being similar to that of the approach to the sump. It was about 10 ft. wide, and averaged 2 ft. 6 in. in height. Peaty water made visibility poor, about 3ft. Considerable difficulty was experienced in making headway, due to air trapped in the suit giving positive buoyancy. An estimated depth of 8 ft. was reached at a point 12 ft. in. The passage continued, dropping steeply as far ahead as could be felt (a further 5 ft.). One small airspace was found about 4 ft. in.

This dive proved that there was no probability of the sump being short and shallow enough to be passable to a free swimmer. It was decided that another dive should be carried out at an early date, using longer duration equipment and an aflo. (It had been the intention to use a Sgamtu and aflo on this occasion, but the smallness of the party prevented it). It was not considered desirable to use two divers as, if the passage continued to drop at the same rate, it would soon become beyond the range of pure oxygen apparatus.

Holes Junction. Here a water filled rift can be seen through a hole in the floor. The water is clear, and the walls are of bare rock. Despite considerable efforts by A.Fincham, the rift was still too constricted to enter, and certainly impassable to a kitted diver.

Operation "Maggie 2" 18.3.61

Diver: E.J.Whaddon

Object: to reconnoitre Styx Rising using Sgamtu breathing apparatus and with better lighting facilities.

All the equipment required for the diving operation was arranged in 8 easily carried bundles, averaging 12 lbs. in weight. A support party of N.P.C. and S.U.N.C. (C.S.) members was organised by C.Green. The equipment was assembled and tested at Styx Junction, and the diver vented his suit here also, to avoid stirring up mud at the sump.

The water level at Styx rising was about 5 in. lower than on the previous operation ("Maggie 1"). Working on a nylon lifeline, the diver descended a steep shingle bank past the point reached previously. The floor deposit changed to a coarse gravel at a less steep slope, until a bare rock floor was reached at a point 15 ft. in from the beginning of the sump, at a depth of 9 ft. There were small

banks of fine silt on either side of the passage which was 10-12 ft. wide. It remained level with a bare rock floor from here on, the height varying from 4-6 ft. The roof contained many hollows and pendants, similar to the approach passage to the sump. The visibility was fairly good (about 10 ft. provided the diver kept ahead of the cloud of fine silt which rose in his wake). The passage appeared to curve very slightly to the left, the general direction being SE. At a point about 70 ft. from the commencement of the sump, a block lay on the floor; it would be suitable for a belay if one was required. A little further on, the floor rose up a gentle slope of bare rock, slightly to the left, with no roof visible overhead. This was ascended until, with a depth gauge reading of 6 ft. (on floor) the line was fouling the roof behind. Blue water could be seen above and ahead, but no airspace was confirmed, although it seems highly probable that one exists. The cloud of silt now caught up with the diver, obscuring the view, and since to advance further up the slope to verify that this was indeed the "other side of the sump" would have made signalling to base difficult, and bearing in mind the distance to base, it was decided to return, which was done in poor visibility (about 1.5 ft.). The furthest point reached was 107 ft. from base. The diving base was on the edge of the rising, and about 13 ft. from the beginning of the sump; the distance travelled underwater was therefore approximately 94 ft. The diver was away from base for 13 mins.

As each item of equipment became ready for transporting, it was removed by the willing arms of the supporters, who made their way out of the cave piecemeal. The last member of the party left the cave at 7.30 p.m. exactly 7.5 hours after the entrance pitch had been laddered.

Conclusions

The first diving operation ("Maggie 1") which was made with insufficient lighting just failed to reach the bottom of the gravel slope at the beginning of the sump.

It seems highly probable that there is a large air surface within a few feet of the point reached during "Maggie 2", and unlikely that excessive depths might be encountered as at first feared.

A further dive should be made with 2 divers equipped with Sgamtu breathing apparatus and 2 aflos, only one of which need have a line reel. the 1.5 ft. block seen on the floor about 80ft. from the diving base would be suitable for a belay, and if so used, would prevent the line from pulling against the roof as the slope was ascended.

E.J.Whaddon

II Dub Cote Cave, Horton in Ribblesdale

General

Dub Cote Cave is a small, rarely visited, cave in the Penyghent area. It is an old resurgence cave, believed to be a flood rising connected with Brackenbottom rising, or possibly even the Douk Gill system. On rare occasions, a considerable stream flows out of the cave, but normally it is quite dry, until a terminal pool is reached about 120 ft. from the entrance. It was thought that it was possible that beyond the pool a way into high level flood passages might exist.

Operation "Dub 1" 18.2.61

Diver: E.J.Whaddon
Supporters: A.Fincham
K Ashton (NPC)

This dive was made with a D.S.E.A. modified, breathing oxygen on demand. Lighting was by means of a 3-cell NiFe accumulator and cap lamp set. Visibility was good, the only mud came from the diver's boiler suit ! The passage appeared to slope steadily down at the same dip as the bedding (about 15°), on a bearing of about 320°. The floor was of smooth rock, strewn with sharp angular rocks. The height of the passage was 2 ft. at first, but after 12 ft. it increased to about 5 ft. The left hand wall was undercut at the base along the bedding. The passage widened, and there appeared to be a roomy way on ahead. The furthest point reached on this dive was about 18 ft.; a second dive of length 25 ft. confirmed the findings of the first. Maximum depth reached was estimated to be 8-10 ft.

Operation "Dub 2" 10.6.61

Diver: E.J.Whaddon
Supporters: C.Green
K.Ashton
A.Wilson (NPC)

Object: to reconnoitre using longer duration equipment, and to prepare a survey of the complete known cave from the entrance.

The diving dress worn was a Shawad: the breathing apparatus (Sgamtu) and aflo, etc. were taken into the cave and assembled without difficulty.

The diver soon reached the furthest point of the dive in February, and pushed on, examining both walls. The line to base caused great difficulty, continually snagging in the rocks on the floor, and making progress difficult. At a point 55 ft. from the commencement of the underwater passage, the depth was 9 ft., and the roof was 3.5 ft. high. Within a couple of yards the roof lifted to 5 ft., and shortly after, the passage ended against a vertical wall. The end of the passage appeared to be a cross rift, but no way on from this point could be found. Friction on the rope made signals impossible, and the return to base was made in poor visibility, winding the rope in and removing snags on the way. The diver was away from base just over 20 minutes.

Conclusions

The result of the second diving operation was disappointing in view of the promising appearance of the underwater passage entered on the first operation. It is just possible that a low way on may exist which was concealed by fallen rocks. There is no denying the fact that in times of heavy rain, a heavy flow of water rises from the cave. However, an important factor is that the cave is almost at the bottom of the limestone: the entrance is only 12 ft. vertically above the basal conglomerate (as deduced from the outcrop 50 ft. south of the entrance). The conglomerate is less than 20 ft. thick, and it lies unconformably on steeply dipping Silurian Slates.

E.J.Whaddon

III Bransgill Cave, Horton in Ribblesdale

General

This important rising was examined by the C.D.G. on 11.4.54, (C.D.G. Derbyshire Section Review for 1953-55, p.4) when "Price found closure to the bedding plane". It could not have been thoroughly looked at on this occasion.

It was further examined by E.J.W. on 19.4.60 (C.D.G. Review for 1960, p.3), who found that the water rose strongly from an 18 in. high bedding plane 60 ft. from the entrance on the north side of the cave. About 100 ft. from the entrance was a deep pool which looked as if it became active in flood conditions. The dive carried out on 19.3.61 was in this pool, and since it is uncertain whether any actual diving was carried out on the occasion of the visit in 1954, the operation was named "Bransgill 1". The above water portion of the cave was surveyed on 24.6.61 by J & R Squire and E.J.W.

Operation "Bransgill 1" 19.3.61

Diver: E.J.Whaddon
supported by members of the N.P.C. and the S.U.S.S.

The BA (Sgamtu mod) was tested in the stream at the cave entrance, and worn by the diver for the 100 ft. crawl to the pool.

Dress: SEISWH.

The diver walked down a steep slope of pebbles mixed with mud and coarse gravel, and was totally submerged within 10 ft. from the edge of the pool. The bottom of the slope was reached at a depth of 11 ft., when the floor comprised bare rock with scattered boulders and gravel gently sloping downwards. At this point the roof height was 7 ft. The diver followed a rock wall, keeping it on the right hand, and moved in a general direction of SE. At a distance of 49 ft. from base, the depth was 17 ft. A way straight ahead 4.5 ft. high and 5 ft. wide could be seen, with the floor sloping still deeper. Visibility was about 10 ft., with no signs of current. Signals to base did not appear to be clearly received, probably due to rock pendants, and so it was decided to return. The bearing on return was NNW, visibility about 1 ft.

Conclusions

It seems highly likely that the pool is a backwater, active only as a flood rising. The point reached in the dive was fairly free from mud, and was probably part of the active streamway. A further dive should be made by 2 divers, both prepared for a long dive. There is a high probability of extensive passages between the rising and the Hull-Hunt Pot systems on Penyghent, but it is likely that the lower reaches nearest Bransgill are more or less totally submerged, and even if the way ahead remains as roomy as at the beginning, it is doubtful if air spaces will be met for some distance.

E.J.Whaddon

IV Witches' Cave, Easegill, Westmorland. N.G.R. SD 660800

General

Witches' cave lies in the NW bank of Easegill Force, below Casterton Fell. It is known that in periods of wet weather, a large stream flows out of the entrance and down the Gill. The nearest point to it which can be reached by road is near Gale Garth Farm, on the Bull Pot Farm road, over threequarters of a mile away across rough country and 350 ft. higher in altitude.

The cave is a roomy bedding plane cave, with bare rock floor, and widens out considerably inside the entrance. Nearly 200 ft. from the entrance, a pool with a pebble bottom ends at a vertical rock face. By the use of scaling ladders, it is possible to climb up this face for about 15 ft. to an upper

passage which ends in a 20 ft. ladder pitch into a deep pool, most certainly connecting with the pool nearer the entrance.

Operation "Witches' cave 1" 17.9.61

Divers: E.J.Whaddon
J.M.Wright
Supporters: D.A.Raine
R.Wilkinson All
H.Riley N.P.C.
T.K.Hargreaves

Both divers used lightweight diving dress (SEIS), and Sgamtu Mod. B.A.s together with aflos. In addition to scaling tackle, this gear made the carry from the road (and back again) somewhat arduous, but it was expected that the length of the dive would rule out the use of short duration B.A.s. A pool in a rock basin outside the cave entrance was conveniently situated for testing B.A.s and venting suits, while the scaling ladders were erected inside the cave. It was thought that a submerged way under the overhead route might exist, but since part of the diving kit had already been taken up the scaling ladders, the original plan of diving from the base of the 20 ft. pitch was adhered to. Some of the weights were dropped by accident down the pitch, and diving for them revealed a 13 ft. deep rift down which they had apparently dropped. The bottom of the rift being too tight for further progress, they were considered as lost. The two divers took it in turns to search round the walls and floor of the terminal chamber on a line. Visibility was poor, less than 6 ins. The average depth of water was 7 ft., but rifts running E-W in the floor went down to an average of 10-12 ft., after which they became too tight. It is possible that they are the sources of the stream in wet weather. In the SW side of the chamber a low underwater crawl was penetrated for 10 ft. into warmer water, possibly a backwater.

The base of the wall behind the ladder pitch was investigated and the 13 ft. rift crossed. A bedding plane crawl at an average depth of 6 ft. on bare rock led gently upwards, and E.J.W. emerged close to the scaling ladders, after having passed a 17 ft. sump.

There was little further that could be done that day, so the arduous return journey across the fell with the kit was made, this time in darkness.

Conclusions

It is doubtful if continuation large enough to take a diver exists. Any further dives should be carried out after a dry spell, to take advantage of low and clear water.

Divers should enter the terminal chamber via the 17 ft. sump, to avoid the need for ladders, (and additional possibility of getting mud dropped into the water). The rifts in the floor should again be examined in clear water. There are a couple of water-filled rifts near the cave entrance which may lead into backwaters that could be examined.

E.J.Whaddon

J.M.Wright

V Spring Trap Cave, Wharfedale N.G.R. SD 976706

General

Spring Trap Cave is situated on the east bank of the stream which rises out of Black Keld, and is a quarter mile downstream from this important resurgence. In wet weather, water flows out of the cave into the stream. Halfway between Spring Trap Cave and Black Keld is another rising close to the bank of the stream, and which is only active in wet weather: it is choked with pebbles, but it seems likely that both it and Spring Trap Cave are flood risings for the Black Keld system. A windpump close to Spring Trap Cave apparently draws water from the same system.

150 ft. from the entrance to Spring Trap Cave a static pool sumps. The length of the pool varies with the weather, but at the time of the first dive it was 50 ft. long and averaged 2 ft. deep.

Operation "Spring Trap 1" 25.6.61

Diver: E.J.Whaddon
Supporters: K.Ashton
A.Wilson
J & R Squire

Using a Sgamtu breathing apparatus and working on a line, the diver entered a submerged passage similar in character to the passage before the sump, 6 to 8 ft. wide and averaging 3 ft. high at the centre. It dipped gradually until a point about 50 ft. from the commencement of the sump was reached, when the floor rose, and at a point 55 ft. from the start of the sump, an air space was entered, approximately 15 ft. long and widening to about 12 ft. at the northern end. The diver had now come to the end of the rope, so returned. The floor of the passage was bare rock, with small silt banks at either side. In the pool before the sump was an enlarged joint about 1 ft. wide and 5 ft. deep.

Operation "Spring Trap 2" 16.9.61

Divers: E.J.Whaddon
J.M.Wright
Supporters:- R.A.Jarman (CDC & BPC)
R.A.Elliot (BPC)
D.A.Raine &
R.Wilkins (NPC)

The water was higher than on the previous dive, due to heavy rain the preceding week, and the edge of the pool was nearer the cave entrance. E.J.W., leading and laying line, the divers progressed for 50 ft. along submerged passage, and arrived at the point where the sump had commenced on the previous dive (marked by lowering of the roof and sudden lack of stalactites). It was decided that the air space previously reached might not now be usable, and that there was little point in continuing the operation.

Conclusions

A further dive should be carried out by a pair of divers at a time when the water level is low. It should be borne in mind that continuous rain soon affects the water level of the risings in the Wharfedale area.

E.J.Whaddon

THE SPRING TRAP - BLACK KELD DRAINAGE

K.Ashton

Black Keld has been shown, by Myers, to be the resurgence of the Mosssdale water, having a flow which is copious, peaty and liable to flooding. On the other hand, Spring Trap Cave, described in the previous article, contains clear water which is trapped by the neighbouring water pump. Midway between these two lies a still pool of water whose height fluctuates slightly but which can flow in very wet weather.

Measurements of the pH (acidity) of these waters taken using indicator papers graduated in steps of 0.3 showed no difference between Spring Trap and the pool, but indicated a lower value (higher acidity) for Black Keld. There is no point in quoting the actual pH values obtained by this method because of the inherent inaccuracy, but the relative values were significant. These results are consistent with Black Keld being fed with peaty, acidic water which, due to recent flooding, had not regained an equilibrium value, and to the other two springs being fed by underground pickup and drainage directly from the limestone surface. This contention is further supported by the fact that, when the pool floods, it flows clear whereas Black Keld becomes very turbid. This also provides evidence in favour of the contention that water tables in limestone are local and discrete since we have here an example of at least two large bodies of underground water in close proximity and yet, apparently, quite unconnected.

Douk Gill Scar, long thought to be the main overflow rising for flood waters from the Brans Gill Head system, was finally proved to play this rôle in 1954. Ten lbs of fluorescein introduced into Hull Pot finally emerged 10 days later at both Brans Gill Head and Douk Gill Scar, the weather during the latter part of the test being rather wet. In dry or average weather, Brans Gill Head flows steadily, draining the Hull Pot group of pots, Hunt and Penyghent Pots, the Churn Milk Hole area, Silverdale Gill Pot and finally the whole of the southwest side of Fountains Fell as far over as Out Fell, while Douk Gill remains dry. In wet weather, Brans Gill increases in volume somewhat, but after a while, Douk Gill starts to flow, frequently very heavily. In severe conditions of flooding, the flow at Douk Gill Scar may be several times that of Brans Gill at the same time. Consequently, between the junction of the two passages and the outflow of Brans Gill Head, there must be an appreciable constriction which limits the flow.

If we assume that in dry weather the flow through to Brans Gill does not back up much inside the cave, then there should be a passage with an airspace leading from the entrance to Douk Gill to the hidden stream between Hull Pot and Brans Gill. This idea, of course, is an old one and has encouraged attempts to penetrate the very flat and wide bedding plane.

Further thoughts on the subject followed the partial opening up of the Fountains Fell drainage systems in the shape of Hammer Pot and Magnetometer Pot. These ideas are based on the results of six key fluorescein tests carried out by members of the Northern Pennine Club over a period of years. The results are summarised below :

.....* * * * * <		
	Distance	Time to
	in miles	nearest
		half-day
Hull Pot to Brans Gill and Douk Gill	1	10
Hunt Pot via Penyghent Pot to Brans Gill	1	9
Churn Milk Hole to Brans Gill Head	2	2
Silverdale Gill Pot to Brans Gill Head	2.5	2.5
Gingling Sinks to Brans Gill Head	3	3.5
Rough Close Sinks	4	4
.....<		

Ignoring small possible variations in time due to different weather conditions, it seems apparent that these tests suggest that the main cave systems feeding Brans Gill Head can be divided into two dissimilar groups : Hull Pot and Hunt Pot systems having a long travel time in the order of 10 days for one mile, and the Fountains Fell system as a whole having an average travel time of one day per mile approximately. These facts lead one to believe :

- (a) That the main water system of the Hull Pot group is of a submerged, slow-flowing type, unlikely to be directly explorable at water level, and
- (b) The Out Fell - Fountains Fell - Silverdale Gill system must be predominantly vadose in character over its main length in spite of the frequency of local sumps found at the Fountains Fell end. This lends weight to the idea of penetrating Douk Gill Scar in the hope of reaching the main inlet from the Fountains Fell system which might then be explorable by means of scaling tackle.

How far back behind the outlet of Brans Gill Head may this inlet from Fountains Fell lie ? If we make a simplifying assumption, then a rough idea may be obtained. Assuming that the water system from Hull Pot to Brans Gill is submerged all the way and the speed of flow is uniform, then the velocity is 176 yards per day. Somewhere along this line the Fountains Fell inlet joins in and acquires approximately this same speed in the submerged zone, the Fountains Fell inlet being small compared with the main Hull Pot flow. Now the relationship between the times of flow for different distances on the Fountains Fell side does not allow of very much time being spent in the submerged last portion of the journey. To take a conservative view, one day might be a reasonable guess. This would imply that the junction of the two systems is not likely to be more than 176 yards behind the rising of Brans Gill Head. It might well be even nearer than this. Thus two avenues of approach are suggested :- there is a sporting chance that cave diving at Brans Gill might show results; and a better chance still of success at Douk Gill. In fact if Douk Gill is pushed with sufficient determination it will surely go.

REOPENING THE CAVERN - IREBY FELL

T.Reynolds

I. General History

Introduction

The Northern Pennine Club can honour themselves as being the first club to make any real constructive effort in reopening the cavern, since the entrance was blocked in 1954. Previous unsuccessful attempts had been made; much to the disappointment of many potholers, who regarded the cavern as being a major cave in a strategic area, and warranting more consideration, it was therefore proposed by various members, including myself, that the situation needed rectifying. Although some members were not in full support of the project, their argument being that the cavern had already been discovered and explored, we carried out operations to the full and with a certain degree of success.

There are many reasons for supporting a scheme of this nature, one being that the details can be steadily worked out over a long period, and time can be allowed for thought on a scientific line, as against the rushed burrowing of an anticipated glory which never seems to come. Before running ahead with digging we realised that a great deal of thought and study would be necessary, if we were going to attain the success we sought.

The entrance to the cavern lies in a stream bed which under normal conditions is dry. The bulk of the water is taken underground by two inlets marked as higher and lower on the diagram. After sinking in the stream bed about one hundred feet away from the cave entrance, the higher inlet comes out over the first pitch. The lower inlet sinks about twenty feet away from the entrance, and surmising from examination of a survey in Cave Science, 1949, we assume it comes out over the second pitch. In 1954, an overnight deluge flooded the cave and washed in mud and boulders from the banks of the surrounding entrance with the result that it blocked the first pitch. The water from the higher inlet could not be drained away and consequently a large pool formed over the blocked pitch, entirely submerging it, and preventing any attempts at clearance. To remove the pool a da was constructed outside the cave and above the inlets, but to our amazement, the reverse happened for instead of the water level dropping it rose. This was the whole key to our problem. Working on the theory of the whole pitch being full of water, we would expect the level of the pool to drop, and then copensate as the higher inlet increased in volume. In other words, if the obstruction was further down the pitch as it had always been thought to be by earlier excavators, the pool level would have remained unaltered, no matter how much we diverted the stream. This was not so. The pool changed its level with the increase of water from the higher inlet. The pool's independence from any other influences suggested that the obstruction was at the top of the first pitch and quite within our reach.

Finding that the obstruction was only a few feet from the entrance, we were encouraged to go ahead with operations. Our party of cave diggers and "lookers on", ready to be assisted and encouraged by Bert Tucker, who was on the first party to explore the Cavern way back in the dark days when Alum Pot was a clint, were eager to put theory into practice, and by mid-June a fleet of Austin vans were regularly departing from the cottage.

With the aid of a flock pipe, we were able to drop the level of the pool by about five per cent of its volue over a period of a day provided the weather was stable. But this was not sufficient and after a mid-week rainfall the whole cave flooded, making the situation quite impossible for further work on similar lines. More vigourous steps had to be taken.

At about the beginning of August, operation "Water Bucket" came into being. A mining company was formed and well-known club Pharoes recruited or forced able-bodied probationary members into the task of donkeying for them, and many a despondent newcomer was whipped into hauling the best cottage bread bin up from the depths below. With furious determination and maybe the aid of gravity, the bin was hurtled back again to be filled from an intermediate settling tank by the "experts". An antique treasure of the past in the form of a favourite Pennine bathtub was used for this purpose and possibly other things too. Thus developed the ponderous sequence of events which carried the water to the surface: pool to coal bucket, coal bucket to coal scuttle, coal scuttle to bath tub, bath tub to bread bin, and then on reaching the surface an empty bread bin to be emptied and sent underground again to repeat operations.

Obviously other methods had to be used, and a spontaneous, unconscious act of Albert Wilson, rather than a considered rational act of judgement, now altered the sequence of events. Whilst Albert was probing about in the pool with a crowbar, he discovered by accident the long sought outlet of the pool. All efforts were concentrated on this point, and to our satisfaction the level of the pool dropped. Finding more places where the water could be drained we succeeded in appreciably reducing its volume. Although we had succeeded in draining off most of the water, we were still hampered by a small trickle from the higher inlet, which was enough to turn the whole place into a slimy mudbath and make further work almost impossible. After wallowing about like hippos at the London zoo, we decided to erect an aqueduct to carry the water over the digging area and away down one of our newly found drains. This took the shape of a length of flook pipe supported by several short slings belayed to the roof.

Concentrated digging was now able to commence and many eager diggers from Thackthwaite Beck to Fountains Fell came in their numbers to support a project which before they had thought quite worthless. After three or four weekends of hard work the digging team broke through to the top of the first pitch and with the aid of corrugated iron sheets and oil drums were able to make the entrance reasonably safe, ready for a party to descend.

The Cavern was now reopened. We had achieved what we had aimed for which was (a) to remove the pool at the top of the first pitch, (b) to remove the blockage which had caused the pool and had barred access and, (c) to remove the doubt in people's minds as to whether our efforts were warranted.

II Details of the successful attempt

A Wilson

In the summer of 1961 it was decided to investigate the situation at Ireby Fell Cavern where a large flood in 1953 had completely blocked the passage quite near to the entrance.

First inspections revealed nothing to raise any hope of a solution to the problem. The entrance passage leads down a steep boulder slope to a large sump where the original passage had been, and no visible outlet for the water was located. The sump measured about 20 ft. long, four feet wide and 15 feet deep and with no outlet this was quite an amount of water. Added to this was the fact that two inlet streams were feeding the pool so that any baling would have to be done at a very fast rate. One experiment was obvious, however, before any baling was begun - to dam the surface stream and so cut down the water from one of the inlets. In this way we could determine the rate at which the water drained through the blockage.

Efforts in this direction commenced immediately and a large dam was constructed across the surface stream bed. The water was successfully stopped on the surface but on inspecting the pool

level it was clear that the water level had risen quite considerably. This was very disconcerting at first but we deduced that the dam must be over a sink which led to the inlet below and that further sinks in the bed which originally by-passed the blockage were now being starved. The dam was thus broken down and work finished for the weekend.

During the week, surveys were studied and the nature of the blockage was analysed.

The long boulder slope had originally led to a lower section of passage before coming to a 20 ft. pitch. As the lower sections were of reasonable proportions, it could be assumed that the pitch was not blocked for the whole of its depth and that the whole boulder slope had moved with the stream to block the lower section of passage. Measurements to the head of the inlet passage indicated that there was at least a six foot depth of rubble above the constriction.

The first major work then, was to cut off the water from the main inlet and divert it down one of the other sinks in the surface stream. This was made possible by the use of 6 in. diameter rubber hose, which with suitable end sealing could accommodate the whole of the surface stream so making the main inlet dry. No great difference in level showed itself so that baling had to commence. All the water had to be lifted about 40 ft. to the surface to find a sink that would not return to the pool. An overhead cable was installed to take buckets to the surface but a full day's work served only to reduce the level about five feet. No signs were seen which would help to ease the difficulty.

During the following week floods had taken their toll and the water marks on the wall showed that the pool had risen about 30 feet during the week. However, it was now back to its normal level and there were indications that the water must be draining away in some sections of the pool at a greater rate than in others. It was thus decided to dig in one possible place to try and get a porous layer in order to get rid of the water that way. A hole was dug some four feet deep and as expected an increased drain off was observed. This was the most important discovery to date and eventually proved the key to the solution. A channel was cut into the hole and the water left to drain during the week.

Once again severe storms during the week had brought down tons and tons of rubble from the surface and had completely blocked our original water sink so that again a head of about forty feet of water had been produced. Thus several weekends had to be spent in making sure that further debris would not flow into the cave itself and to this end several walls were built across the stream bed and a new course constructed so that the cave entrance did not get the full force of the stream.

With drier surface weather, efforts were redoubled and the sink was dug out to a depth of about 8 feet to a good porous layer. The smaller inlet stream was then piped to a sink inside the cave which did not connect with the pool and the large inlet was piped over the pool into the newly dug sink. In this way it was possible to drain the pool completely in about 15 minutes by continuous baling.

At last then, we were able to set foot on the rubble itself and commence digging a shaft over the blockage. Good progress was made but a great deal of time was wasted in sawing off stemples to hold back the rubble. The five foot depth of rubble proved to be quite inaccurate however and attempts at a breakthrough had to be abandoned once again until the following week.

Digging was reasonably easy and it was clear that the soil and peat in the rubble was responsible for the waterproofing. The shaft eventually hit boulders and the small amount of water in the shaft drained away. Another foot and the breakthrough was made. The stones apparently fell about fifteen feet before going over the edge of the next pitch. After a further hour there was enough room to get through and inspect. A very dangerous boulder slope led to the head of the pitch which had no visible bely.

Again work had to be abandoned for the week and the following weekend had to be spent in making the boulder slope safe and also fixing oil drums in the excavated shafts to stop any further earth movements.

Finally on the 19th November, the way was open for the first descent. Rawlbolts were inserted above the first two pitches and at a later date a third may be inserted for the third pitch.

ECHO POT, FOUNTAINS FELL

C.Green

Brian Heys, writing in an earlier number of this journal, claimed that no single person could be blamed for discovering Hammer Pot, and all the misery and suffering it brought to its explorers. During the similar exploration and toiling done at Echo Pot, one person kept very quiet, and watched us with interest from afar:- Echo's sole discoverer and christener, Brian Heys.

In 1958, Brian and I were prodding shake holes in the High Cow Close area of Fountains Fell. This area had for some time interested us, being flanked by the terminal points of Gingling Hole, Hammer Pot and Magnetometer Pot.

A stream normally sinks to the north, and a continuing dry valley runs down through the area. Work at the stream sink had yielded no results, but just below the sink a small shaft leading to a shattered chamber was later uncovered. The stream could be heard beneath the boulder floor of the chamber, but it was too constricted for further work.

Brian was hammering a block in the bottom of a shake hole in the dry valley, when he heard resounding echoes from each hammer thump. An acoustical assessment of the surroundings proved that the echoes were from a chamber immediately below, and a little clearing revealed the first 32 foot pitch.

I was not present the following weekend; it being the club's immemorable "climbing" meet in North Wales, with Bert Tucker's tilley truck. The only events I can recall are Trevor sitting down in Bethesda cinema, and a whole row of seats collapsing; and Bert's famous oration on Snowdon, condemning mountain top cafes, followed half-an-hour later by his gulping down many cups of tea at the summit cafe.

At Echo Pot the first pitch was descended and an easy winding passage followed to a narrow rift, later named the first quarried fissure. The surface party included Alan Jowett and his son. As Jack Myers emerged from the entrance great shouts of "Daddy, Daddy, why does Uncle Jack look so dirty today?" came from Jowett junior.

With other work at Silverdale Gill, Echo Pot was forgotten about until September, 1960.

About this time we had given up at Silverdale for the third (or was it fourth?) time; the stemming of Hammer Pot had been stopped and we were wondering where to dig next on Fountains Fell. Echo Pot's entrance was found to have collapsed, and a few weekends were spent digging it out and building a Gordon Batty type dry stone wall.

Then started the long quarrying work, Saturday after Saturday, at the first barrier. The chief quarrymen were Jeff and Bob Hart, Gordon Batty and myself. Slowly the fissure was widened to body width. We were urged on by echo noises again that appeared to be resounding from a chamber beyond; and by the thought of Jack Myers' large theoretical cave that he had somehow calculated must exist beyond the fissure.

All this proved correct when after 12 feet of fissure we climbed down an 8 foot pitch into an easy walking passage.

This passage led to a chamber and in the floor lay a magnificent hemispherical bowl of limestone. We think it is quite a unique water worn rock. Beyond the chamber, the passage, now very low, was blocked with calcited boulders.

A 25 foot pitch just before the boulder blockage, landed into a roomy chamber with a perfectly circular floor. We were very disappointed to see that the way out of this chamber was a bedding plane no more than 1 foot high. Gordon wriggled on, and found a rock bridge blocking it; but he could see a crawlable way beyond. So again the quarriers got to work and removed this second barrier.

On the next trip were Jeff Hart, Gordon Batty and myself. Jeff pressed on first, along the bedding, past the now broken up rock bridge and wriggled flat out into a canal. He was just able to keep his head above water and protested loudly.

His 78 inches of body length were too much to wriggle back again, and anyway we were not going to let him, so he carried on followed by Gordon and I.

After a sharp and awkward bend we slithered out of this horrible water and mud filled canal, into a crawl with a very irregular and jagged floor. And for the third time the stone smashers had to spend a couple of weekends removing an obstructing block; the third barrier.

Beyond, the crawl continued with a narrow rift in the floor, which always delighted in swallowig hammers and chisels into irretrievable positions. A final headlong wriggle landed us in a small chamber with what looked like a sump, and no apparent way on.

Jeff examined the "sump", said he could see an airspace above it, and was prepared to have a go. Gordon and I just shivered and gave him every encouragement. After all, we thought, Jeff had just qualified in New Cave Exploration Techniques, at the probationary members training school, being run by a certain member at Limekiln Pot - and we would have attempted underwater squeezes when we were his age.

So through he went, and emerged into a dry bedding plane beyond. I have never liked this "Bird Bath" squeeze since on one occasion I jammed in it with my face under water.

Jeff carried on to a drop of 8 feet, and entered a narrow rift passage. Gordon and I could hear shouts of "Come on"; to which we replied that we would if he could drain the "Bird Bath" for us. So back Jeff wriggled, lowered the level by a few inches , and we followed on. The Limekiln Pot Training School had certainly taught him to respect the wishes of us older members !

The rift passage soon turned through a right angle where the fourth barrier was reached. Having broken up this awkward block, a long narrow rift appeared, about 60 feet in length, dead straight. The first 25 feet were too narrow to wriggle along, with any safety.

So started many weekends' arduous work of knocking down the walls of this narrow 25 foot section. Bob Hart was the best tool for this job. Being long and exceptionally thin he could wield hammer and chisel well along the rift.

Finally 21 feet were widened out; and with only a few feet to go we were able to get a look into 40 feet of easily crawlable passage.

In the distance was the rumble of a stream. We liked to think that this was the stream sinking further up the valley, where the digs at the beginning of this article were mentioned.

As usual, with the coming of better weather the work was discontinued. In August 1961 there were tremendous floods in Craven. The Club's tackle was trapped in A.G. Cavern, until a washed in blockage of gritstone boulders was removed. The drystone wall above Echo Pot was knocked down with the force of water; and Bob Caton told us that a great wave of water washed over his tractor bonnet. We did not worry about Echo Pot, assuming that nothing could block it.

In December 1961, Al Wilson, Ken Ashton and I were feeling very despondent after Ireby Fell Cavern had blocked, only one week after we had reopened it. Ken had issued both the trips that bottomed the Cavern, and when he finally came for his first trip down, the thing had fallen in. The Ashton "Hoo-Doo" had obviously hit the Cavern.

When on the following weekend he accompanied us to Echo Pot for his first trip down, I remember joking on the surface that his "Pot-Blocking" powers could have no possible effect at Echo.

Everything went well until the bottom of the 25 foot pitch. I landed in a pool of water, where normally was dry rock. The bedding plane was flooded with about 2 inches of air space remaining. I went in on my back as far as I safely could, and started swishing my legs in the hope that I might release a dam of blocking clay.

All I did was to make a wave that swished across my face. I swallowed an unpleasant amount, and my immersion suit filled up. So we sadly retreated.

Ashton's wretched blocking magic had struck again ! His friends now refuse to go on walks with him, that pass by Gaping Ghyll, just in case

The final catastrophe occurred at the entrance - an incident that we have never dared tell to Gordon Batty. The writer was climbing out up the dry stone wall, in his usual clumsy manner, when it partially collapsed beneath him. We are hoping that Gordon will come and rebuild it when he is tired of his present occupation of house building in Settle.

So now we will have to wait and see whether the next flood washes out the blockage, or makes it worse. The sides of the bedding crawl were of clay; so the floods in all probability washed these in.

With a good neck seal immersion suit it would be quite possible to progress further along the flooded bedding; the main trouble being that there is no room to turn.

The present Fountains Fell Team still consider that Echo Pot offers the best hope on Fountains Fell; if and when we can get into that section mysteriously shown on Gordon's survey as "Surveyed but Unexplored !"

And finally, our thanks to Mr. H.Caton for permission to open and explore the pot during the last few years.

Ludwell Fairy Holes

R.Hylton

All caves, it would seem, were at one time regarded as the haunt of fairies (it would be a major advance in caving techniques if we could find out how they managed to keep clean and shiny), so it is necessary to distinguish one fairy hole from another by adding another name, so, as the Ludwell burn rises from this lot I call it Ludwell Fairy Holes.

At one time the system seems to have been called "The Kiddley Holes of Westernhope", a very nice name, vastly superior to the majority of cave names and well worth considering. It may be that "Kiddley" means "Fairy" - perhaps someone skilled in these matters knows or would investigate this.

Anyhow, the Kiddley Holes of Westernhope are mentioned by Morley Eggleston in a book about Weardale, written in the last century in which he publishes an account of a caving trip undertaken by some local worthies. They saw a waterfall and white fishes and stalactites. Of this trip evidence is visible in the cave.

Jack Newrick made the present discovery of the cave entrance; the entrance in the last century may have been directly in the stream bed which is now blocked by boulders. He also found the sinks in the Blaeberry Burn about two and a quarter miles away.

The O.S. Map required is "Teesdale" and the ref. for F.H. is 945373 and for the sinks 928347. The sinks are at about 1300 feet and the rising is at about 1200 feet. The limestone here is approximately 60 feet thick. So far the cave has been explored for about two-thirds of the distance from sink to rising, about two and a half miles of cave explored, about two miles surveyed. It is a single watercourse with no significant tributaries, so far, and it angles along the joints with a deep pool at every angle.

In the first three hundred or so yards there is some good calciting on the walls, but thereafter very little calcite is found, some in Vein Chamber, some in the Choir and some in the Sarcophagus.

Apart from the long traverse near the beginning and some scrambling over rock falls, the way lies in the water all the time and this makes for rather slow progress. The depth of water varies according to weather conditions and also according to the number of parties who have been up previously, kicking out dams and stirring up sandbanks. Under normal weather conditions the depth will vary from mid-calf to chest deep on the average man. At the end of the dry period in 1955 it was possible to go up without getting wet to the waist.

A year later Jack Myers and I were out of our depth in one pool, Corbel's Wader, named after a waterproof garment worn by a Frenchman called Corbel who boasted it had kept him dry in all European caves. In F.H. it sank with all hands.

The entrance is about 20 feet above the rising. It is a small hole and goes via a short crawl into a chamber, down a 20 foot easy climb into the water.

A few yards upstream you come to the waterfall, formed by a mineral vein across the passage which holds back twelve or so feet of water. On your right is a fissure leading by a devious route onto a traverse over the canal so formed, an easy traverse on broad ledges with a wide stride across a joint near the start, a clamber over a boulder and, some way along, a pool; this can be quite disconcerting the first time. After a few feet on hands and knees you emerge suddenly from a small hole eight feet

above the water and clap the brakes on while you decide whether to come out head first or feet first. Here you can either go down into the water and up again on the other side or you can traverse round to the left on the calcite. At the end of the next stretch you might as well get down into the water; it's a lot quicker and you have to get there sooner or later anyhow.

Here, in the stream passage, is some good calcite; make the most of it, you won't see much more.

Four hundred yards in is Farewell Hall where the 1844 expedition turned back having left their names, the date and the name Farewell Hall chalked on the wall.

J.D Muschamp 3rd June, 1844
Geo Race and Jacob Walton

Leave their names alone, don't add your own insignificant monniker and pass on to Boulder Chamber, a large chamber 600 yards in with some fine big mussel shells in the roof and a great ramp of huge boulders opposite you.

At the foot of the boulder pile, a hole leads back into the stream and, via a duck, into the passage again. From here it is possible to climb back into Boulder Chamber arriving at the top of the boulder pile but that is a pleasure which should be reserved for floods, when the duck is too deep to negotiate and you need an escape route.

Plodge upstream until you get to Vein Chamber about a mile in. Here you climb out of the water and rest for a while in an insalubrious sort of chamber with a few straw stalactites on a vein of fluorspar.

From here, if you keep up, you get to Coral Gallery where some big corals stand out of the rock.

But back in the water lies the way, emerging at a rock fall to climb into Grave Chamber, so called because, to get further you lie in a square cut grave and wriggle through into a crawl, through another chamber and back into the water until, reaching the Choir, you finish with water for some time.

The Choir is a large chamber with a procession of stalagmites like choirboys in white surplices.

Appreciating that certain large angular blocks on the floor opposite fit precisely into large angular vacancies in the ceiling and reflecting on the effects of cave development on cavers' noddles, you pass via a short crawl to the Vestry, another large chamber which you leave by an upper way above the stream.

Somewhere about here is the end of the survey and from here the Via Dolorosa goes for an estimated 300 yards of crawling sometimes hands and knees and sometimes flat out. Mind you don't go to the left or you will land back in the Vestry.

At the end of the crawl you drop down to a sandy ledge and go up a most unlikely looking slant.

Don't take any other way. If you go forward you will get into a small chamber with difficulty and back out with even more difficulty. If you go back you will land in a curiously complex stream passage where you can fool about for hours.

So take the slant, unlikely though it looks.

Further than this I have not been but Dan Jones says that a twenty yard stoop brought him to the Sarcophagus or H Chamber, entering by the bottom right limb, and leaving by the top left.

A boulder floor here mounts to the roof then down through a small hole to a sandy passage, follows four hundred yards of roomy stream passage and the roof comes down to water level and that was drought water level at that.

Other ways have been tried with not much success though and only a little more has been added I believe. No way in at the top end has been found though numerous searches have been made, even to the extent of reopening Westernhope New Mine in the hope that it might touch the cave, but no success was achieved.

There is some good photography in the first three or four hundred yards of the stream passage and in some chambers above formed by chocked boulders in the rift but pack your gear in a haversack under your chin; you will have to stand deep in water with nowhere to lay anything down for many shots, and it's a frustrating business when you reach behind you for your haversack and find it full of water all sloshing through your camera.

SILVERDALE GHYLL POT

Episode 1 G Batty

The Early Days

Interest in Silverdale Ghyll was first aroused by Mr. Caton of Neals Ing in the summer of 1947. He contacted members of the N.P.C. and suggested the club should dig in that area.

A party of club members along with Mr. Caton inspected the site and decided to dig out the main water sink in the Ghyll.

During the summer holidays, several members of the club spent a few days excavating a hole of some 18 feet depth in loose boulders and silt without any apparent success. Whilst this dig was in progress a rift about 25 feet deep was discovered nearby in a small depression. Although water from the main sink could be heard from the bottom of this hole, no trace of it could be seen.

Over a period of several weeks only a small amount of digging was done, together with the use of a large number of "Giant Powders" which littered the countryside with debris, frightened motorists and gave the sheep heart attacks. No apparent change in the dig was noticed. Later the hole was fenced around and completely forgotten as the time of merrymaking was close at hand.

Second Thoughts

Silverdale Ghyll was completely ignored for five years until 1952 when "Jim" and "The Little Stiff Chap" decided to have a further look at the rift discovered in 1947.

This intrepid pair found a small shaft leading from the level previously reached, and, on the following evening, came prepared to venture into the unknown. After much struggling T.L.S.C. succeeded in wedging his anatomy in this cul-de-sac of a rift. By attempting to retrieve T.L.S.C., "Jim" managed to pull several hundredweights of the roof onto his back and dare not remove them in fear of dislodging something onto T.L.S.C. With difficulty, the offending rocks were removed from the back of the "amateur Atlas" and a hasty retreat was made to the surface. T.L.S.C. was then heard to remark - "If that is speleology, I am promptly going to terminate my activities" - or words to that effect which are unprintable.

Now we come to the "New Team" who use their heads for purposes other than hanging their hats on.

Episode 2 C Green

I was spurred on to write this article after hearing, on good authority, that at least one per cent of club members waded through my semi-scientific dissertation on Fornah Ghyll Cave, in a former journal.

Knowing how about 99 per cent of N.P.C. members only bother to read short concise statements, I can summarise Silverdale Ghyll by:- "60 foot shaft dug out - leads to nowhere of importance."

To the otherone per cent, anxiously awaiting details, here goes:

December, 1957. The Club's Great Fountains Fell Addict had developed a phase for digging on hilltops and impossible silted up fissures. He, in his peculiar way, insisted that they were promising.

Gordon Batty and I inspected one of his digs just to the East of Silverdale Ghyll Road, and agreed that it looked good, in that it might lead into the chimney of a disused lime kiln nearby. Apart from that, we weren't very interested in "Pot Pot".

We walked over to Silverdale Ghyll Pot, across the road. A little proding uncovered a continuation to the main fissure.

The following day, suffering from the effects of the Christmas Dinner, we staggered to the pot accompanied by Keith Asquith of the B.P.C.

The water was now all sinking into a pool upstream of the pot, and we were able to descend the main pot - now completely dry.

And so commenced the months of bucket hauling of washed-in stones and clay.

We started hauling using a paint pot, on a rope. Quickly realising the immensity of our task, we widened the fissure. This gave sufficient room to use a bucket, and the inevitable tripod and pulley arrangement followed.

With January came the snow and biting winds, but we struggled on. An opposition team, in the race to Brantsgill Head also struggled on across the road at Pot Pot; led by the Great Fountains Fell Addict.

Every Sunday the G.F.F.A. and apprentices would visit us, muttering about impossible blockages of glacial drift. As we found out to our cost some months later, his remarks were completely true.

Only on one occasion in the club's history has the G.F.F.A.'s lust for digging on Fountains Fell been seen completely to break down:- A strong snow blizzard was blowing around the pot, one Saturday afternoon, when suddenly things started to look good. An open washed fissure appeared and a strong wind whistled through.

But the G.F.F.A., in his peculiar way, frozen and stiff with cold, threw down his crow bar and drove off at break neck speed.

We enlarged the sink upstream of the pot, to ensure that it would be dry under all conditions of the stream. Several water diversion trenches were dug. I would especially mention the work and cooperation of the following in this task of trench digging and water diversion:-

William Holden - for making an excellent trench lined and slabbed over in Neo-Gothic architectural style. The whole thing proved to be completely useless apart from being a good hiding place for tools and a grand puzzle for archaeologists of future generations.

Trevor Reynolds - who excelled in making little diversion dams. These, though very pretty at the time, were soon washed away and quickly blocked the main sink that had been so arduously dug out by certain other gents a few days before.

By such coordinated efforts do our N.P.C. projects always succeed (?).

And finally, to Brian Beardwood and Brian Unsworth who dug most of a trench for diverting the main stream past the pot and on down the valley. May the North West Electricity Board bear no grudge against them for the chaos they so nearly caused to the scheme for laying on power to the

valley ! Overhead power cables were being run up to Dale Head House and beyond. The N.W.E.B. erected telegraph poles at 60 foot intervals up the ghyll, right past the pot. The following Sunday we arrived for the opening ceremony of the new diversion trench. We hoped the water would not flood on down to Stainforth. Our fears were unfounded - it chose to sink right at the base of one of the power cable poles.

We stood petrified, waiting for the pole to topple over, with the water undermining the foundation, and maybe dragging others with it. But it remained upright - and is to this day.

The attraction of the dig dragged one or two members from their armchairs, members whom we rarely see at Greenclose.

One such arrived with an enormous vegetarian lunch - slung over his shoulder, in a persil-white pillow case.

Having comfortably seated himself on a nearby slab of rock, he laid out his array of herbal mixtures and vegetable sausages.

So intent was he on his eating that he failed to notice that hundreds of eyes were watching - the sheep of Penyghent were wondering what had intruded on their sacred domain.

Two hours later, finished lunch, he slung the pillow case over his shoulder and set off across the field for home.

Then they descended on him - hundreds and hundreds of sheep; from Penyghent, Dale Head, and up the Ghyll they came. The poor fellow managed to scramble over the wall and roar off to Settle on his famous Harley-Davidson motor bike.

The weather grew worse, and so did our transport - Gordon Batty's Jowett van.

One memorable Sunday morning we set out from Greenclose trying to convince ourselves that a small knocking from the engine was only a loose something-or-other; nothing to really worry about.

Through Clapham there was a distinct knocking; in Austwick we felt rather embarrassed by a loud clanking disturbing the village; and by the time we reached Stainforth heads were popping out of windows to see what sounded more like a decrepit steam engine than a Jowett van.

It gave one final gasp and collapsed in a heap, halfway up the Silverdale Ghyll road.

When N.P.C. members land in such a situation with their transport, one thought immediately flashes across the mind - SEND FOR JIM.

This was duly done, and during the following weekends, essential repairs were carried out.

Heavy snow presented an ideal opportunity to learn how to ski, and an excuse not to dig.

Bert Tucker discovered that broomsticks are not a good substitute for ski sticks. Bob Leakey tried to teach us jump turns, but his dog, always following close at heel, seemed to manage them far better than we could.

When next skiing season comes, Trevor Reynolds would be well advised to obtain a pair of skis that don't keep coming off his boots and sailing off downhill on their own.

The Jowett van was repaired, and we made another attempt to get it up the road to Silverdale Ghyll. This resulted in sliding back into the ditch and once again a SEND FOR JIM S.O.S. went out.

Then one fine Spring Sunday morning saw great excitement amongst those assembled at the pot - A "Member Of The Old Team" is due to arrive any minute to lend a hand !

At the respectable hour of 3 p.m. the M.O.T.O.T. appears over the horizon. Offers to lend caving gear are heaped upon him. He staggers into Graham Harrison's yellow pullover, and pops the seam; pulls on Gordon Batty's digging suit, and busts the zip fastener. Colin Green's helmet comes right over his eyes and is so large he can wear it backways, frontways or sideways.

Like a knight in armour, he descends to the bottom of the shaft. We on the surface are quiet, and listen - there is mumbling and scuffling in the depths. Then - a shout - a cry of agony and pain. Ten minutes after descending the Member Of The Old Team has resurfaced.

The M.O.T.O.T. gives us advice - we should "carry on digging" - and he disappears back to the comfort of his sitting room in Settle.

The dig soon developed into a second pitch that we shored up and rigged with a scaling ladder.

On the Sunday before Easter, we wriggled into a clean washed fissure, in which one could stand up.

At eye level were two boreholes, easily big enough to wriggle along - and the draught was terrific. Very excited, we celebrated at Helwith Bridge Hotel that evening. Once again, I was stranded at Greenclose for the Sunday night and rolled into work four hours late on Monday morning.

Good Friday - a large party gathered at the pot. Graham Harrison was first through the borehole and entered a small chamber, whose roof must be very near the surface. We crawled on following the draught into a chamber full of gritstone boulders, and that was the end; digging and boulder shifting was too dangerous.

The other borehole led to a chamber too dangerous to enter. An abortive attempt was made to clear some of the loose boulders with a hoe. (This hoe is now lying at the far end of Fornah Ghyll Cave. Anyone returning it to Dick Hylton at Greenclose will receive his blessing).

In 1958, a slump had occurred in Fountains Fell digging activities, but we had not forgotten the strong draughts that whittled down the Silverdale Ghyll boreholes. We decided that rather than potter about in the shattered chambers beyond the boreholes, we would dig straight on down the main shaft.

So we constructed a winch in Leach and Burgess' workshop. It was very effective - being driven by a JAP engine with a friction drum round which one looped the hauling rope.

The edge of the pot gave an excellent foundation for building a base pedestal, using limestone slabs from the side of Penyghent and lots of cement from Norman Thornber. Suitable building slabs were hard to find, but we had a couple of large iron trays to which we would harness Brian Beardwood when they were loaded.

After a month's building, the base bolts were grouted in, the winch fixed in position and the whole contraption unveiled by Bert Tucker at a short solemn ceremony.

The engine made a terrible noise, so a series of lights and electric bells were rigged between the digger at the bottom and the winch operators at the top.

At times the strong ingoing draughts carried down large amounts of fumes; so an exhaust sticking up 6 feet in the air was fitted.

The shaft slowly deepened - and more shoring was fixed, where a loose wall kept collapsing in.

At Easter, Gordon and I decided to dig for 5 days, non-stop. We erected my tent and set up a soup kitchen. Various members called to help with digging and drinking the soup. On Easter Sunday a flood washed in lots of debris from the shored up wall. We gave up again.

Some time later, while emerging from the borehole, I suddenly heard a stream through a small hole in the wall. A little enlarging showed a narrow rift parallel to the main pot. Further hammering revealed that the rift was 25 feet deep, and a stream could be seen at the bottom, but it was too narrow to descend.

So started another long session during the winter 1959/60. The rift was slowly made wider, and Roy Wilkinson went down it. He reported a 25 foot pitch reaching a stream passage with a further 10 foot drop into a chamber.

He had slithered down easily enough into the fissure - and although he was on two lifelines it took three people pulling hard to get him out.

A few more weekends were spent quarrying - and then we all descended. The stream disappeared into a silt blockage which would have been very difficult to dig. We went upstream and shovelled the upstream fill downstream, but this revealed nothing further.

Some attempts were made in the roof above the shoring. This involved bringing down tonw of loose boulders from the roof, and now the 25 foot pitch is blocked and the approach to the boreholes is sealed off.

Quite recently another aven has opened up, which looks promising and we have started again !

I think interest will continue in this place for several reasons:-

(1) The stream makes a major contribution to the drainage system lying to the east of Penyghent. Its water flow ranks with Ginglyng Wet Sinks and Churn Milk Hole.

(2) The draught has to be felt to be believed.

(3) The limestone is only about 100 feet thick, when bed rock is reached. It dips toward Churn Milk Hole. We have already reached a depth of 60-70 feet.

(4) Water divining reports indicate a large stream passage heading towards Churn Milk Hole.

And finally - whoever enters the master cave will find a calcified smoking pipe - please return to Bill Holden. It fell out of his mouth while he was inspecting the pot under flood conditions.

We would like to thank Mr. H.Caton for permission to excavate, and for the interest he and his family have shown in the pot over the years.

BECKERMONDS POTS, WHARFEDALE

K.Ashton

These two small caves, first described Jowett at al. appear in Pennine Underground as two separate caves whereas they do, in fact, both converge upon one large chamber. They are of no great import but served to provide three members with a pleasant afternoon's surveying practice where it was possible to make a loop. The closure error was about one foot. The "system" displays its mode of formation very clearly and the only remark that need be added to the survey is to point out that the bedding plane aa', bb', cc' which contains a shale band forms the roof of the big chamber which itself probably represents an earlier epiphreatic stage. Both inlet streams derive from the same surface stream, its upper sink reappearing in Beckermonds II and the lower sink in Beckermonds I. The water almost certainly reappears in a cave further down the dry valley but a short way from the river.

This area still holds good pottering prospects for the odd afternoon and may yield a few short, amusing caves with photographic possibilities.

The Major Underground Drainage Systems in the Yoredale Limestones of the Askrigg Block

J.O.Myers

It has been traditional to assume that the only areas of serious interest to potholers in the North of England are those where the Great Scar Limestone is exposed, preferably in considerable thickness. However, to the north of the Craven district, where the Great Scar Limestone dips under cover, the Dales intersect a whole series of alternating beds of limestone, sandstone and shale. Similar conditions continue farther north beyond Stainmore in the area known to geologists as the Alston Block. The area discussed here is that lying between Stainmore and the Craven Faults, known as the Askrigg Block. The more important limestones within this area are listed below:-

- Main Limestone
- Underset Limestone
- Three Yard Limestone
- Five Yard Limestone
- Middle Limestone
- Simonstone Limestone
- Hardraw Scar Limestone
- Gayle Limestone
- Hawes Limestone
- Great Scar Limestone

All the limestones are separated from each other by variable thicknesses of sandstones and shales.

The possibility of major caverns existing in these comparatively thin and nearly horizontal beds did not at one time seem very great. However, in 1952 I was introduced to the possibilities of Ayle Burn Cave near Alston by Brian Heys, and to Fairy Holes in Weardale in 1953 by Jack Newrick. Both of these caves, which lie in the Alston Block, are parts of drainage systems which have a distance of over two miles between sink and rising, due to the gentle dip of the limestone across the area. As the exploration of Fairy Holes progressed in 1953 it became obvious that there were no sound geological reasons why similar systems should not exist in parts of the Askrigg Block.

The most obvious of the major risings was soon spotted, that of Cliffe Force visible from the main road opposite to the Buttertubs. It was soon apparent that no adequate source for this could be found in the headwaters of Cliff Beck. Neither did there appear to be a source just over the watershed on the Wensleydale side. Prospecting of this area, however, eventually resulted in the discovery of the open but unexplored Sod Hole Gill Caves. At an early stage it was realised that the headwaters of Sargill in Wensleydale might sink into the Main Limestone and a broken stream was seen on the O.S. map. This site was visited and the stream did surely sink, but only just. Lots more water in the area flowed happily over the same limestone bed without sinking. However, the sink did not appear to have any local rising and so the area was noted as a possible source. Eventually all the main streams eastward from the Buttertubs to the Askrigg-Muker road were checked. Before this part of the investigation was completed my attention was drawn by Bill Holden to the fact that a major feeder of Oxnop Beck in Swaledale appeared likely to be a significant rising. This was visited and found to issue from boulders of limestone in the hillside above the Askrigg-Muker road. For a time the source of this water was elusive, but soon from a process of elimination it was seen likely that sinks in the Main Limestone on the east side of Whitey Gill in Wensleydale were contributing to a flow under the surface watershed at Blackstone Edge, and emerging into Oxnop Beck. This stage of the investigation was reached early in 1959 by which time the idea of caves traversing underneath the main Dales watersheds was gaining hold. Over the period of six years or so other possible

systems had been looked at but Whitey Gill to Oxnop seemed the most clear cut example found. Accordingly, on Saturday, 14th March 1959, I spent three hours with a small spade and diverted the whole of Whitey Gill into a convenient sink and added three pounds of fluorescein at 3.00 pm. Oxnop Beck was visited the following morning at about 10.00 am when fluorescein was clearly visible in addition to an abnormal increase in the size of stream. Later that day the diversion at Whitey Gill was cut off again, returning the flow to normal. This satisfactory result led to the next major test, that of the sink at the head of Sargill. Here five pounds of fluorescein were introduced at noon on Sunday, 5th April, 1959. Brian Heys who was with me, being still sceptical of the whole idea of this particular test, went down the beck to watch for fluorescein. None appeared, however, though we stayed about the area for an hour or so. We had arranged this test so that Brian, who was free for the next couple of days, could visit the area and watch for fluorescein. On Tuesday morning, 7th April, I was dragged out of bed rather early by a telephone call. After some initial leg-pulling it transpired that fluorescein was flowing strongly from Cliffe Force. This was too good a chance to miss, so after a quick breakfast I motored up the Dales on a beautiful sunlit morning and feasted my eyes on the glorious green water pouring steadily out of the hill. The stream was green all the way down through Muker to its junction with the Swale.

At the same time as this work was going on, other areas were steadily being investigated. In August, 1956, Brian Heys and I visited Crackpot Fairy Holes near Summer Lodge Farm. This turned out to be not only a cave but a major rising, a point not mentioned in the standard reference then available. We examined the boulder choke at the back of the cave, pronounced that there must be a major passage beyond, but that digging would be dangerous: we then departed, not to return until the Richmond Grammar School Caving Club had demonstrated that, though dangerous, the boulder choke could be successfully dug. In the meantime one or two walks about the Swaledale side of the main watershed failed to reveal enough water sinking to account for this major rising. Interest was concentrated initially on the area around Bloody Vale and the Summer Lodge Mines but, although some water does get into the Main Limestone, it is only a fraction of that which appears below Crackpot Cave. The area around Beezy Moor in Wensleydale, where the Main Limestone shows a dip towards Crackpot, seemed a most probable source for some of the water. A sink here was tested with three and a half pounds of fluorescein one Sunday in September, 1958. The farmer at Summer Lodge agreed to watch for us and nothing more was ever seen of that particular lot of fluorescein. This negative result threw my thinking out of gear for a while and two more tests were needed before things were straightened out again.

Towards the end of 1954 I had been looking again through the Backhouse manuscripts in the Central Reference Library in Leeds. In the section dealing with mines on the north side of Wensleydale between Askrigg and Carperby, Backhouse describes one of his walks as proceeding up Thackthwaite Beck, past where it issues from the limestone. On the map it is not at all obvious whether Thackthwaite Beck picks up from a number of sources or not, but here was a clue that seemed very interesting. I had previously seen the stream in its lower part near the road, where it is known as Eller Beck but from here one cannot see the country behind, from which the stream flows. I walked up the beck past Wet Grooves Mine, past a small hydroelectric installation, then on up to a point where the beck issued from a scree of limestone. Following up this gully, where there are obvious signs of faulting and steep dip of the limestone I arrived at the top to find the water sinking just beyond. This was rather disappointing, however I continued upstream and eventually reached the far eastern end of the limestone scars which lie above this hidden valley where the full force of the water was flowing from a scree slope at the foot of the scar of Underset Limestone. That day I crossed the moor to Beldon Beck and found an interesting pothole sink near its headwaters on the south side in the Main Limestone, and established the general absence of drainage on the south side of the plateau between the rising of Thackthwaite beck and the Askrigg-Reeth road. The conclusion seemed probable that the waters of this tributary of Whirley Gill and the head of Beldon Beck were the source of Thackthwaite. There are a number of faults in the area and the bed between the

Underset and the overlying Main Limestone is thin, so that it would not be surprising if the Main Limestone drainage cut down into the Underset at some point underground.

A later walk with Brian Heys showed that the area north-east of the Thackthwaite rising to the area of Locker Tarn could not be providing water for the cave system. Further walks in the Beldon Beck area, however, showed that a series of sinks along the outcrop of the Main Limestone on the north side of the valley, extending as far round as Woodale showed signs of drainage to the north-west which would bring them to Crackpot Cave. As, according to the Geological Survey map, there was a fault between these sinks and the main one of Whirley Gill, I was prepared to suggest that part of the drainage of Beldon Beck went to Crackpot while part of the headwaters went to Thackthwaite Beck. Brian was not convinced, however, and favoured Crackpot as the destination of the Whirley Gill water. On 17th April, 1959, fluorescein was put into Whirley Gill Sinks. On the morning of the 18th we saw it emerging strongly from Crackpot Cave, colouring the beck green all the way down to the Swale. No colour appeared at Thackthwaite. Not long after this, Gordon Batty, Dave Gibbon and I were digging in the area and after spending some time at the wrong place, we opened up Whirley Gill Pot which led down to the main stream cave from Whirley Gill Sink. This led off directly in the direction of Crackpot, but at the time of writing has still not been followed for more than a couple of hundred of yards or so down a wide bedding cave on the base of the limestone.

All this was very interesting, and added to our knowledge of the Crackpot Cave system, but we were still no wiser as to the source of the very considerable rising of Thackthwaite Beck. There was still a possibility that sinks on Beezy Moor and in that neighbourhood might flow down dip in the ML and eventually cut through into the UL to emerge at Thackthwaite. At Easter, 1960, a disproportionate quantity of fluorescein introduced to the sink downstream from Satron Tarn emerged less than half a mile away to colour Oxnop Beck like green paint. A local farmer, quite unperturbed, was heard to remark - ♦Aye, it allus seems to turn green about this time of year♦. Still Thackthwaite remained unproved, so on 21st December 1960, Brian hiked across the moor to the sink at SD 951943 and put in about three pounds of fluorescein. The following morning Crackpot was once more green. Now we had two proved sources for Crackpot and absolutely nothing to account for the equally large stream of Thackthwaite.

I became more than ever convinced that the only way to find out where it came from was by direct exploration. My patient propaganda in favour of digging it out met with no response for a long time until one Sunday in September, 1961, A.Fincham, C.Hawkes and R.Wilkinson were short of something to dig, so went to Thackthwaite. After a couple of hours work in the scree below the cliff face they gained access to a dry cave. Later, in four more visits the ♦two Wilkies♦ (R.W. and C.W.) gained access to the main stream and as described elsewhere, exploration was possible upstream for about 700 yards. The cave heads north for Beldon Beck and it seems likely that it must be drawing its water mainly from gradual sinkage into the Underset Limestone, though so far no convincing place has been found suitable for a fluorescein test.

Along with the concentrated effort on the places mentioned above, many miles were walked elsewhere in search of other underground systems. I was aware of the possible existence of some caverns in Apedale. Some years ago, a friend of mine, Frank Woodall, met an old miner, Kit Peacock, at Redmire. Peacock had worked in the Harker Level, a mine which is driven north in the ML at the lower end of Apedale. Peacock related how one day in driving forward along a vein the end of the level blasted out into a great open space. They thought to avoid this by sinking down in the floor of the level some distance back so that they could go underneath the cavern. However, after sinking only a short way the bottom of the shaft fell out into another open space. A miner was lowered part way down into the hole on a rope, but soon called to be pulled up again, saying that he could see no wall in any direction. Apparently these caverns were never explored. At the present time, Harker Level is peculiar for being completely dry; in fact in wet weather water leaks into the

mine from the hillside above and sinks again. Unfortunately a complete fall at about a quarter of a mile from the entrance prevents exploration. A branch level just short of the main fall is filled to the roof with deads and is backfilled as far as light will penetrate - could this have been the way to the caverns ?

On the north side of Apedale there are several sinks into the ML which clearly have no rising in that valley. The water could possibly drain down dip to the east to Keld Heads but insufficient water reappears here to account for all the sinks, though there is an interesting little unnamed cave. Hence it appears more likely that a north-easterly drainage exists, so the water could rise in Swaledale, thus forming another inter-dales system. The necessary fluorescein test has not yet been made here, but it seems possible that the water will emerge from a lead mine in Cogden Gill. This gives rise to a strong flow of water which brings sand and gravel through with it. Unfortunately the mine is blocked by a roof fall after a comparatively short distance. There is at present no natural rising from the ML in the area which is large enough to account for such a system. There are undoubtedly large caverns to be explored in this area, though the chances of gaining access seem rather slim.

SOME THOUGHTS ON HYDROLOGY

K.Ashton

Mention hydrology to a potholer and, if he thinks of anything at all, he will think of colour testing, of finding out where such and such a stream reappears. If a little more sophisticated, he may think in terms of automatic dye absorbers such as charcoal for fluorescein or mordanted cotton for rhodamine B. Although such information as is provided by colour tests and related methods is a first essential if the hydrology of a region is under consideration, it tells us little of the cave itself. A full consideration of limestone drainage is very complex and, as yet, little studied but we can, by being observant and perhaps being a little scientific from time to time, go much further than this.

To begin with, if we know how long it takes a dye to traverse a cave system and we know where the sink and resurgence are, we can judge if the rate of flow is normal, slow or fast, once we have established standards. Allowing for the average gradient from sink to rising, we can thus hazard a guess as to whether the flow is free, or ponded either in vadose or phreatic conditions.

When heavy rainfall occurs, rivers rise generally, but a definite flood wave travels along a cave. If the cave is vadose, this wave will take some considerable time to travel down the cave, whereas the same pulse will pass instantaneously through a phreatic zone as water is directly displaced. This effect may often be observed by comparing the flow of a cave with the river into which it flows, a greater delay in the rising of the spring pointing to a greater length of vadose and a smaller length of phreatic passage. This effect is often striking enough for the local farmer to have noticed it and is often worth asking about. Another marked effect is the turbidity of a resurgent stream which will be high if the stream comes from peaty moorland and which will increase on flooding. An absence of turbidity in areas where surface feeders are turbid points to pickup from percolation, condensation and local drainage off limestone. If, during the initial stages of the flooding of a spring, clear water is ejected which later becomes turbid, this indicates a system with surface feeders and a phreatic zone. This effect is caused by the flood pulse which is transmitted instantaneously through the phreatic zone whereas the major part of the turbidity is due to the arrival of actual flood water when this has passed through the phreatic zone to the resurgence.

From this point onwards the amount of information we can obtain depends on the trouble we take. For example, both the pH and the hardness of the water increase, in general, as we pass through a cave system. A sudden lowering of these quantities can indicate an inlet long after temperature changes have been absorbed. It should, however, be noted that waterfalls produce a drop in pH of as much as 0.2 for a 30' fall in flood (this change is not linear) and so care must be observed in interpreting such results. Consider a cave system of known sink and resurgence and hence of known height difference and order of length. If the overall pH across such a system is lower than normal, once again in reference to standards to be established, unless there is a local inlet we would suspect a system of many pitches rather than one having a steady fall. In this respect we would have to consider the existence, or otherwise, of a phreatic zone which tends to increase the pH considerably.

Considerably more information can be obtained by considering the fluctuations of these many quantities in time and this far more complex matter will be given a preliminary consideration in my article "The hydrology of Karst Districts" to appear in C.R.G. Transactions Vol. 6, No. 2.

At the base of Blue Scar, amid tons of limestone blocks, Thackthwaite Beck emerges. This water has long mystified certain Pennine members as to its source. Although Beldon Beck, about a mile to the north of the scar, is the most likely source, all dye tests have proved negative and the only major sink in the area, Whirley Gill, has proved to resurge at Crackpot Cave.

With these facts in mind, Chris Hawkes, Chris Wilkinson, Alan Fincham and the author set off to try to force an entry into the scar. Mr. Powlet, the landowner, readily gave his permission for the attempt and even offered us the use of his landrover. The scar was approached directly from where the beck flows along the north side of the main road, a route which proved exhausting when loaded with heavy digging tackle, but which offers a great impression of the activity of the old miners.

The water emerges about a third of the way up the rubble slope where a wall runs downwards from the scar and it was decided to begin digging where there was a platform on top of the rubble to the west of the wall. Rather than dig a shaft, it was decided to dig the first eight feet in the form of a trench along which boulders could be rolled, but at a depth of only four feet, a bedding cave was found, through fissures in the floor of which could be heard the sound of rushing water. Although it was found possible to descend a fissure off to the right, all the tube-like passages below were found to be either too tight or blocked with rubble and so the problem was left until the following weekend.

This next weekend was devoted to attempts by the two Wilkinsons to sort out the maze of small, sharply corroded passages below the initial bedding cave. The most promising passage was, however, blocked by a substantial boulder and it was thought best to employ a car jack and jack the obstacle out of the way. The next weekend, this was accomplished after two attempts in which the jack simply fell to pieces and, squeezing past, one more false try and much hammering and a part of the stream was reached. There was no immediately obvious way on and so we move on again to the following weekend.

The party now being strengthened by Roy Roebuck, the crawl along the stream was again investigated. An upward wriggle through boulders led to yet another sharp, tight passage from 8 to 15 feet in height with no stream. Turning left down the passage, water was met and, as it appeared deep, exploration was again postponed so that a rubber dinghy could be brought.

Brian Heys was the intrepid voyager and his first discovery was that the water was only some 14" deep and his shout brought the rest of the party charging along the great passage.

From a report by R.Wilkinson

Editorial note

As the report ends at this stage, a further description of the cave would seem necessary. With the appearance of the water, the passage profile becomes low and gothic but then suddenly enters a chamber decorated with both normal and eccentric formations in profusion and beauty. This is the only known part of the cave in which formations are found. The chamber is actually caused by the restoration of the passage to the square-cut form it had at the point of entry. The passage then continues in this form until the total length is nearly half a mile but it has been greatly modified by massive collapse, as is to be expected in these thinly bedded Yoredale limestones. The overall result is that, beyond the chamber, the cave is divided into a maze of small chambers and dead-ends in which it is very easy to get lost. Many of the boulders are, moreover, piled one on another in huge unstable heaps. Holes can be seen in the roof from which many of these blocks have fallen and, in

at least one case, reveal the overlying shale. This could explain how water from Beldon Beck which sinks in the Main Limestone, could possibly emerge in an underlying stratum of limestone although there is evidence of mineralization further up along the projected line of the cave.

Continuing up the passage, a short ladder is needed to descend some boulders and the cave ends in a boulder choke which has, so far, defied all attempts at penetration.

If the main passage is followed to the right, that is downstream, from the point at which an entry was first made, a boulder ruckle is reached which is, in fact, the base of the surface scree and an unstable emergency exit has been dug at this point.

A line survey has been made of this cave by B.Heys and reveals an almost linear, square passage filled with boulders and extending for nearly half a mile.