# SOUTH WALES CAVING CLUB

## NEWSLETTER

C O N T E N T S

Newsletter No.20. July.1957.

## Obituary.

Members will learn with deep regret that on Sunday, June 23rd. Len Garraway was drowned while swimming in Porth-yr-Ogof.

Though Len was not a member of the Club he had applied for membership, and he had visited the Swansea Valley a number of times over a period of years. He first visited the Club with the Rev. C.D.H. Cullingford while a pupil at Monmouth school, and later he made trips over to Mendip with the Wessex and Bristol Exploration Clubs.

Besides caving he was keen on cross country running and cycling and he was a first year student at the University College of South Wales and Monmouthshire studying honours mathematics and philosophy.

In the passing of Len Garraway we have lost a very fine fellow whose pleasing personality and wit would have become an asset to the Club. Our sympathy goes to his parents and brother at Coleford, and also to Seaton Phillips, David Hunt and Arthur Boynes who did all in their power to save him.

Roger Smith.

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## Investigation of air borne bacteria in Ogof Ffynnon Ddu.

The object of the investigation was to determine if the bacterial population of cave air differed from that of the outside air, both as to type of organism and numbers. The same method was used for both determinations.

Agar Plates, which are flat glass dishes containing agar jelly mixed with protein and blood, upon the surface of which bacteria will grow , were used. Any single air borne bacteria alighting upon the surface of the agar plate will reproduce itself until its millions of off-spring are visible to the naked eye as a small spot - a colony. To aid this growth or multiplication the agar plates are incubated at 37°C or, to differentiate those that will grow at lower temperatures, at 20°C.

There are an infinite number of processes by which bacteria are identified and classified; for our rough classification the following basic observations were made.

Morphology. Cocci are spherical bacteria, growing singly, in long chains or in clumps. Bacilli are rod shaped. Spore bearing bacilli posses a covering which protects them against conditions such as heat.

Staining reaction. There are a great number of reagents by which bacteria may be stained for microscopic examination. Whether or not a bacteria will take up, or retain, a particular stain is one method of identification. There is one differential stain by which all bacteria may be placed in one of two groups; this is Gram's staining reaction, and whether a bacteria is stained red or purple by the process determines whether it is grouped as a Gram negative or a Gram Positive organism respectively.

Anaerobic growth. Some bacteria will grow only in the presence of free oxygen ( aerobic growth), others in its absence (anaerobic growth).

Incubation temperature. Nearly all bacteria grow at 37°C, some will also grow at 20°C and these are more likely to be harmless organisms.

Method.

The agar plates were packed in sterile cloths and carried in an airtight container. At selected sites in the cave, plates were removed from the container and exposed for one hour to the air, then covered and replaced in the container. The plates were handled downwind of the air current to avoid contamination from dust off the handler's clothes. The plates were placed in the incubator within two or three hours after exposure and incubated for twenty-four hours aerobically; an additional plate from each site in the cave was incubated anaerobically. Subcultures of each colony type were incubated at 20°C. The bacteria comprising the colonies were roughly classified by Gram's stain. Plates were exposed for one hour tp the air outside the cave, as controls.

The numbers of colonies on each plate were counted for a comparative estimation of the number of bacteria present in the air at different sites in the cave and those in the outside air. It was realised this could only be the roughest of estimations as the number of bacteria deposited on a plate would depend on the amount of air( local draught) passing over the plate.

One full investigation of both types and number of organisms was made and, at a later date, a second investigation as to numbers only. On each occasion, there was an appreciable "negative" draught leaving Coronation Chamber, down through Starlight Chamber and out at the cave entrance. Plates were exposed at these three sites.

Results.

Each colony was, of course, comprised of only one type of bacteria; there were many colonies of the same type on each plate. The first column in the table gives the number of the different colony types; the second and third columns refer to the total number of colonies for the two investigations.

| | | First Investigation. No. of colony types. | First Investigation. Total colonies. | Second Investigation. Total colonies. |
|---|---|---|---|---|
| Aerobic | | | | |
| Coronation. | Plate 1. | 15 | 97 | 90 |
| | Plate 2. | - | - | 20 |
| Starlight. | Plate 1. | 15 | 158 | 228 |
| | Plate 2. | 19 | 114 | 360 |
| | Plate 3. | 18 | 268 | - |
| Within Cave Entrance | Plate 1. | 19 | 342 | 680 |
| | Plate 2. | - | - | 698 |
| Outside Cave. | Plate 1. | 18 | 120 | 104 |
| | Plate 2. | - | - | 78 |
| Anaerobic. | | | | |
| Coronation. | Plate 1. | 24 | 368 | - |
| Starlight. | Plate 1. | 1 | 23 | - |
| Cave Entrance | Plate 1. | 3 | 63 | - |

The Gram stained films of the colonies showed, microscopically, both Gram Positive and Gram Negative cocci, bacilli and spore bearing bacilli. No moulds were isolated. It was found that sub-cultures ( individual colonies transfered to fresh agar plates ) grown at 37°C aerobically and anaerobically, also grew quite well at 20°C aerobically. Very roughly, bacteria which will grow at 20°C are less likely to be harmful.

Conclusion.

It would seem from this very elementary study that the bacterial flora of cave air differs but little from that of the outside air. The bacteria are presumably drawn into the cave with the outside air, in the natural course of the cave's ventilation. The apparent absence of bacteria harmful to man is no doubt due to the fact that there is almost a complete absence of mammalian life in the cave ( actually one bat's skeleton has been found). The bacteria which are present appear to be harmless saprophytes.

As a means of comparing the number of bacteria in the air at different sites, the method adopted of simply counting the colonies on the plates was not expected to be accurate. It was merely hoped to ascertain if cave air was teeming with bacteria or comparatively free from them. The number of air borne bacteria deposited on an agar plate is proportional to the amount of air passing over its surface; only if this local draught is constant, at each different site, can the number of colonies be properly compared. That the air current varied, in this investigation, even within the limits of a few inches, is shown by the varying number of colonies

on the plates at any one site. One cannot therefore say how much the varying number of colonies at the different sites are due to variations in the local draught and how much to variations in the number of air borne bacteria. The discrepancy in the anaerobic count of the Coronation Aven plate is probably a chance variation, due to the plate being placed in an exceptionally strong local air draught.

If the figures in the Table do reflect changes in numbers of air borne bacteria, then there is an apparent increase as the air passes down the cave to the entrance, and there are fewer bacteria in the air outside. If this is the case, it is possible that the wet boulder choke in Coronation Aven, through the interstices of which air enters the known cave, acted as a filter or trap for the bacteria in the air ; then, as the air passed on through the drier and dustier passages, it picked up more bacteria. It would also mix with air entering the cave from Boulder Chamber or the Waterfall series (W.Little, C.R.G. Trans. December 1952).

It may be that there are actually fewer bacteria in outside air, as our figures suggest, because the ultra violet light of direct sunlight destroys bacteria. In a preliminary investigation that was first made the numbers of colonies on the plates exposed outside were only about a tenth of those exposed inside the cave, there was bright sunshine on that day. On the other hand, there was such a strong wind that it moved one of the plates - the air current was certainly greater than any encountered within the cave and should have favoured the deposition of bacteria. Unfortunately, no culture count was made on that day. On the two occasions when counts were made, there was no sunshine and the air currents were somewhat comparable to those within the cave.

However, no real deductions can be made from the colony counts. There is an instrument that is designed for accurate air borne counts, irrespective of the effect of air currents. It is a delicate instrument and is power operated, however.

D.Webley took part in initiating the investigation, both he and W.E.Clarke were valuable co-operators.

E.Aslett.
D.McKinnon.

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## The Mud Sump, Ogof Ffynnon Ddu.

On Saturday March 23rd. last a party of six cavers made a determined attack on the celebrated sump which lies at a high level in a narrow passage running parallel with Boulder Chamber. There were hopes that this might lead into the continuation of Stream Passage which is believed to lie behind the collapse, but previous attempts have been

discouraged by the presence of a deep pool of mud topped with water which lies in the most constricted part of the passage. On this occasion however, the expedition was armed with a pump and there was some hope that if the mud and water were stirred to a sifficiently creamy consistency the pump might be able to move it.

Having prudently arrived late, your reporter avoided having to carry any equipment and reached the top of the boulder slope in time to meet a muddy object barely recognisable as John Hartwell coming out for a change of clothing. Although the pump had successfully stomached a large quantity of water, it jibbed at a diet of mud and after the pump and hoses had been removed to a safe ledge, a line of mud slingers led by Peter Harvey and followed by Les Hawes, Gordon Clissold and friends began paddling the mud towards the exit. Les remarked during this interlude, that according to Don Coase the extension of the passage only led back into the boulders, but he was prevented from making further pessimistic observations of this nature by an involuntarily well aimed handful from in front.

In a short time the passage began to resemble a bath full of chocolate pudding of an interesting texture, and the cry came that the roof of the sump was visible. Beyond this the passage was seen to rise steeply and become large enough to crawl in. It was not loong before, by lying half-submerged in the remainging mud, it was possible to worm under the arch and up the slope.

Alas! Les's memory had proved only too accurate, for after a few yards crawling the passage came to a stop in a grotto of jammed boulders, thinly cemented with calcite. The small holes in this mass showed only more boulders, so that further progress here seems impossible especially as the only place of shelter is back through the mud sump.

It was a disappointed squad of Chocolate Soldiers that regained the surface; but as someone remarked, at least the impracticability of the place can go on record now!

Brian de Graaf.

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## Cave Rescue at Lesser Garth Cave.

At 11.p.m. on Sunday June 9th. a phone call was received from the police at Bridgend asking that a cave rescue party should proceed to the Lesser Garth Cave near Cardiff. Within a short space time Peter Harvey's car had been packed with the necessary equipment and a party consisting of P.Harvey, Les Hawes, Bill Little, John Bevar and myself were under way. The exhilerating experience of driving through the dark at somewhat more than the usual speed was only marred by the comments of our driver as to how much liquid refreshment he had consumed. However the driving was of a high standard and we were soon at the the road which led to the cave. At this point we were joined by Edward

Aslett and the police.

The facts were then told to us. At ten that morning a bicycle together with a small trailer were seen in the woods at the foot of the slope leading up to the cave. At half-past ten that night they were still there so some of the local residents had reported the matter to the police

We toiled up that muddy leaf-covered slope which seemed twice as long in the dark and eventually reached the cave. Fortunately it is an easy cave to search and we soon set about our task. Every nook and cranny was searched but we returned to the surface without having found a sign of anyone.

Outside the cave we were joined by some members of the fire brigade. After some discussion it was decided to split the party into two - one half went down the hill to fetch the cars round to the other side while the rest of us walked over the top to investigate the open iron mine shafts. While crossing through the woods we came upon a tent and in that tent were three little boys!!! No more need be said - no one was to blame. The boys could not have been expected to carry their bicycle up the hillside and they were too young to realise the suspicious circumstances they had created.

A quick walk over the hill brought us to the rest of the party and there then followed a rather odd procession of the fire brigade's car, Peter's car, Edwards car and the police car through the desreted streets of Whitchurch to the local fire station where welcome refreshment was waiting. A not so quick drive back to the Gwyn saw us all back in bed by five o'clock just six hours after the police had ccntacted us.

There are one or two poihts to be observed as a result of this incident:-

1. The cave rescue call-out system works and those who have developed it especially W.E.Clarke are to be congratulated.

2. The party consisted of too many drivers. This might have meant that certain cars could not have been used to carry further equipment and personel to the rescue.

There is just one other point from which certain conclusions mught be drawn - one of the boys in the tent was named Clissold!!!!!

D.W.Jenkins.

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## Dolygaer Station Cave.

The band of limestone which runs across the south of Breconshire from Sink y Giedd to Cwm Taf makes its final appearence at the eastern extremity as a small 'island' of limestone flanking the top dam of the Taf Fechan reservoirs. A single track railway runs alongside the reservoirs, and at Dolygaer halt one side of the track was cut into the hillside, exposing the underlying rock. Here in full view of the station platform but concealed by undergrowth there is a small cave, which I hesitate to call new, since it must have been known locally since the station was built.

At the time when the entrance was pointed out to me I was dressed for inspecting building sites, not caves and therefore I could not proceed beyond the stooping position. The cave runs up dip with a low crawl to the left at about 20ft. At about 30ft the main passage narrows to a crawl, and here there is a series of shallow delicate rimstone pools which merits photographic attention.

The mouth of the cave looks to the southwest, towards the middle of the lower Taf Fechan Reservoir. As the hillside slopes away steeply, the entrance must have been near the surface even before the railway was cut and one may wonder whether Dolygaer Station Cave is the remaining tail-end of some system which once occupied the Taf Fechan valley.

Brian de Graaf.

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## Round and About.

### Weighbridge Dig.

This dig had progressed considerably and it is now possible to walk round in the place. There are signs of the sloping downwards passage in what is now turning out to be a large chamber. Thanks are due to numerous helpers.

### Foxholes at Penwyllt.

We hear that this dig is also progressing favourably and that there have been some promising results.

### Sink - y- Giedd.

This cave is exoected to be reopened shortly after a considerable amount of digging out the old entrance.

D.W.Jenkins.

## Club News.

### Petrol - Club Visits.

With the end of petrol rationing visiting clubs are again reminded that the first weekend of the month is reserved for them and that notice of intending visits should be made in writing to the Hon.Secretary.

### Resignation.

We are sorry that the Rev.C.D.H.Cullingford has found it necessary to resign from the Club.He has been a member of the Club for many years and his field of activities was wide.

### Thanks.

Our thanks are due to the Chelsea Speleological Society for a copy of their plan of the new extensions to Agen Allwedd.

### Congratulations.

Our congratulations to Ann Mason on her recent marriage. We wish both Ann and her husband evry good wish and success for the future.

### Clive Jones.

A long article in the Daily Telegraph gives an account of the caving exploits of Clive who is in Cyprus. We hope that Clive will find the time to send us his own account of the discoveries.

### Change of Address.

D.H.Walters, Welstead, Severnside, Newtown, Montgomeryshire.

### Ned Thomas.

It is with regret that we announce the death of Ned Thomas who was so well known all of us at the Gwyn Arms.

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