

# SOUTH WALES CAVING CLUB NEWSLETTER

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## C O N T E N T S

Number 59

APRIL 1968

1. Diving in Hospital Cave and Agen Allwedd . . . . . The Divers
2. Dan-yr-Ogof -- A Year of Steady Graft . . . . . Dave Judson
3. Possibilities in Dan-yr-Ogof. Part I. . . . . Alan Coase
4. Easter Plans Dan-yr-Ogof . . . . . Alan Coase
5. Caving and Computing . . . . . Paddy O'Reilly
6. A Rampart Taken by Surprise . . . . . Bruce Foster
7. The First River Chamber - OFD II . . . . . Mick Day
8. Great Oxbow Series - OFD II . . . . . Colin Fairbairn
9. Letters to the Editor
10. List of Members
11. Gower Hydrology - Second Section.

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DIVING NEWS

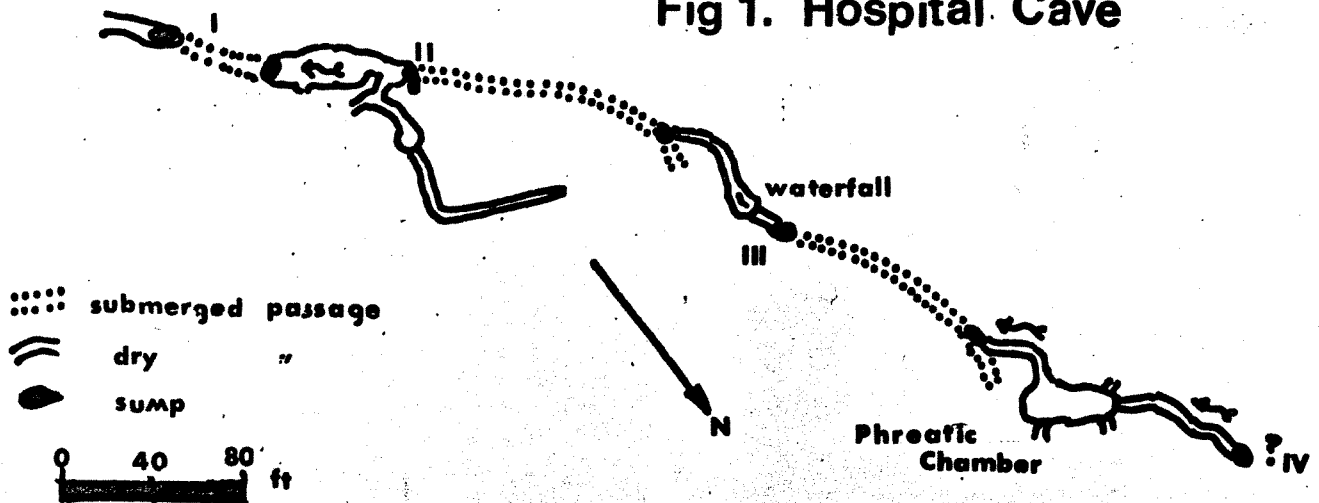
(i) Hospital Cave, 22/839153.

Just before Foot and Mouth restrictions stopped Club activities a second dive was carried out in the cave with permission of the Hospital. The first sump (see N/L 56) was passed by Bruce Foster and Rod Stewart with two other divers at base. Rod then dived the second sump which proved to be about 100 ft. long and was low. The widest route is usually on the down-dip side. The depth was only six feet and several small air spaces were passed until water was heard falling from above. Accordingly, Rod surfaced, leaving the submerged passage, and climbed into a small passage which carried the main flow. This rose some 25 ft. over 80 ft. (including a 10 ft. waterfall) until the route was blocked by the third sump.

On March 16th, Rod was joined by Charles George, Colin Graham and John Oz and the party all passed the two sumps. Some small difficulty was found due to almost zero visibility after the first diver. Rod dived the third sump which carried on underwater dropping rapidly but a passage in the roof again carried the main flow and was entered at some 80 ft. The others followed, and a dry series 300 ft. long was explored ending in the fourth sump which was not dived. Just before the end was a phreatic chamber some 45 ft. x 22 ft. with a small passage in the roof. Almost no flow markings were seen in any of the dry passages which total about 600 ft. now.

J.V.O.  
16 March 1968.

Fig 1. Hospital Cave



(ii) Agen Allwedd - Beyond the Terminal Sump.

Three divers (and three porters - the divers being the porters!) set out late on the morning of March the 16th to examine the series upstream of the terminal sump in Agen Allwedd found by Wooding, Sinclair etc. last year. From reports, there was a very large series beyond three sumps, which led to a shallower fourth sump which had not been looked at. It was intended to have a look at this.

P. Allen (S.V.C.C.), Mike Coburn and Terry Moon started out and were dogged by the equivalent of Smith for Agen Allwedd, or that area, right from the start. Before they started out, the pillar valve from one set nearly blew off leaving only two sets for three divers. Then while walking along the tramroad in a howling gale, the line reel with nearly three hundred and fifty feet of courlene on blew away and rolled all the way down the escarpment unravelling and tangling in everything in its path! By the time they reached the entrance, the zip on one wetsuit had split open and all could think of plenty of reasons for not going on - but they did!

As everybody says, the entrance of Agen Allwedd is a \*\*\*\*\*, especially carrying any amount of gear - however it only took two and a half to three hours to get all the kit to the terminal sump. The last fifty feet, a narrow keyhole, gave difficulty to some very tired divers loaded with their kit.

It was decided that two would dive and have a quick look around and if possible to have a look at the last sump. The first sump was fairly shallow and about twenty feet long. A large airbell was followed by a larger and deeper sump, 80-90 feet long at -10 feet. The divers then emerged in a fairly small streamway, with a large series going off in the roof - blocked by chokes at either end. However, 70 to 80 feet on in the stream there was another sump. This was dived for thirty feet to a small stream passage which got progressively smaller until a constriction led to another sump. The prospect of returning to get the kit did not give rise to much enthusiasm - so they climbed an aven about 60 feet back down the stream to emerge in a complicated network of dry feeder passages of typical Agen Allwedd keyhole cross section. The largest of these was followed for about 2000 feet to what must be the stream again; however it was emerging from a very low narrow sump, about a foot high and three to four feet wide with a shingle floor; it flows across the passage to an impenetrable crack. The amount of water flowing is considerably less than was seen in the main-stream and in sumps I, II and III.

At this point the divers decided to return. This was followed by a shattering two hours porter out in time for a pint - the sad part was that they didn't quite make it and missed closing time by ten minutes.

For a planned trip of this kind, some kind of help in portering needs to be given. Carrying your own kit that distance takes so much out of you that by the time you have reached your destination, you are so tired that much of the enthusiasm worked up for the dive has gone....

Terry Moon.  
(20th March 1968).

DAN-YR-OGOF: A YEAR OF STEADY GRAFT.

The last twelve months has produced very little in the way of new ground (thank goodness). Nothing dramatic has occurred since the discovery of the Far North last March. The Far North was, I think, only visited by three parties in the six months that followed its discovery. A reflection on the state of the weather last Spring and perhaps, a mark of the remoteness of these regions? Consequently its gaping avens (the Girtstone Avens, and Ice Cream Aven in the Right Hand Series), and several side passages were never really considered as having been "pushed".

It was therefore with great promise and expectation that Alan Coase led a party back to the Far North at the beginning of February this year. They systematically investigated the side passages, but found almost nothing. The Avens were only looked at, once more, with awe and wonder; and two more were added to their number. A good "climbing-chappy" seems to be called for.

I think it was early October last; Hume and I had just finished off drilling two Rawl-bolt holes at the head of the 40 ft. descent into the Great North Road. I had long wondered what happened to the continuation of the calcite vein Northwards at the 90 degree bend immediately prior to the pitch. We climbed up about 15 ft. and then followed an obvious rift-developed tube for about 150 ft. until the route was almost completely blocked by a calcite flow down the left wall. Peering through the small aperture that remained a considerable cavity was observed. After a small amount of hammer and chisel work, we were standing in a ten feet high chamber, though this was still part of a washed-out calcite vein. After a constricted ascent and descent in the rift of about 15 ft. we entered an almost circular tube of about 3-4 ft. diameter. This whilst still heading approximately north, formed a detour from the vein to the East. Within its 200 ft. length was contained a superb dried-out crystal pool. A very thin sheet of delicate pink crystalline material had collapsed over its surface. The whole consisted of very large flat, loose crystals, in places heaped up in a strange manner to form small stalagmites; a lunar landscape in microcosm. We were eventually stopped at a distance of about 600 ft. from Birthday Passage by what was effectively our passage breaking into the side of a large aven. Below was a drop of about 20 ft. to a large sandy ledge, below that we could hear the stream. Above, the passage appeared to continue about 25 ft. higher up.

This passage is a continuation of Windy Way and Birthday Passage northwards, and presumably represents the original phreatic course of the Fignen Felin stream. Why should this passage be so much smaller in this region than the present day stream passage, since both seem to be closely related to a zone of north-south faulting? This seems even more surprising when we consider the size of the passages further north, which seem to be, at least in part, contemporaneous with this small phreatic tube (The Mostest, and the Great Hall area). Perhaps more light will be shed on this question when we get down to the detailed survey and study of this part of the system.

Whilst the recent dry spell in February and March brought the 3rd

Lake down to a record low (somewhere around navel-level), it did nothing significant to the pools and sumps in Mazeways. A careful search in this area by Paddy O'Reilly and myself at the beginning of March, (and earlier by Coase and others), revealed only one small find. This was a 150-200 yd. low undulating crawl, which after a flat-cut squeeze gave access to large clean-washed passage; -- an earlier part of Mazeways main passage! This is a very frustrating region!

The survey started in Boulder Chamber last Autumn, has now passed its two greatest obstacles, the Long Crawl and the Green Canal, and has reached a temporary halt at the Rising. Work is being carried out with the object of publishing a C.R.G. grade 6D survey on a scale of 1:1000, (1cm. to 10M.), of all the major passages, with the lesser ones being surveyed to Grade 4D. It is my intention, as a parallel exercise, to produce another survey to the scale 1:2500, showing the cave systems on plan only, superimposed on a surface features survey with a maximum amount of surface material and possibly including contouring. We have a long way to go with this work as yet!

In order to expedite the remainder of the underground survey work the idea of an underground camp came to mind. As a primary objective, a 4/5 day camp is planned at Easter. (Editor's Note: See later in this N/L.) Only time will tell whether the weather-overlord will allow this event to take place or not. Whatever, the equipment will be there and a telephone link is now almost complete from the cave entrance to Bat Chamber. This can be left as a semi-permanent feature in the cave until all the field work has been completed. The feasibility of Friday-through-Sunday trips should prove a valuable asset throughout the coming Summer.

At the present moment work is feverishly underway on the production of a two-way speech communication and position finding device (after H. Lord). If this can be completed and tested before Easter it should prove another valuable tool to our aid.

As I have said, the telephone line is now all but completed. It is, for the most part, securely fixed and well out of reach of all but the most acrobatic of cavers. It has taken several week-ends of hard graft to install and I hope that in places like the Long Crawl, for instance, everyone will do their best not to wreck it. It is a valuable link with the outside world, and in times of accident may prove to be a life saver!

David M. Judson.

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#### POSSIBILITIES IN DAN-YR-OGOF: PART I.

Two years have now passed since the breakthrough into Dan Yr Ogof II and it seems an appropriate time to take stock of the position and to list some of the chief points of potential.

Dan yr Ogof I. The history of exploration of most of the cave systems in this country reveals a similar pattern. After the initial breakthrough most effort is concentrated on the furthest obstacles and often areas near

the breakthrough point or the entrance are ignored or only superficially examined. The late discovery of Fault Series in Ogof Ffynnon Ddu is a particularly good example of this. Thus in Dan yr Ogof it would be most unwise to "write off" the 1937 series, or if it comes to that, even the Show cave. It should be remembered that exploration of these areas had not been fully carried out when caving was halted and even though the eighteen months between reopening in Whitsun '64 and at Easter '66 was spent on an intensive pushing program, some possibilities were left untouched, some not entirely exhausted, and some interrupted by, and subsequently ignored as a result of, the passing of the Long Crawl... So What? might be the comment. What interest is there in this part of the cave apart from entering attractive new grottoes? Leaving aside the geomorphical and other scientific benefits that could accrue, most members will appreciate the problems and indeed the dangers created by the river system. Thus our first objective of finding an all-weather bypass and escape route to the lakes remains of major importance.

Secondly, an alternative to the Long Crawl is obviously desirable and it seems quite likely that not all connections are as densely blocked as the end of Gerard Platten Hall. Where are the possibilities for these objectives? At least two present themselves in the Show Cave as possible Lake bypasses.

The first is the large passage that must lie beyond the boulders on the shelf at the end of Cauldron Chamber. Rather spasmodic attempts have been made here over the past two years and a passage is now passable for about fifty feet in the choke. Alternatively the sand tube also on the same ledge is proving an easy, if claustrophobic dig.

The second is that of the dreaded Knockers Passage to Razor Passage connection which could provide a bypass to Lake III although in exceptionally high water the entrance from the lakes to the Siphon Series shows evidence of sumping and so the route would be of marginal value.

Progress in the upper series above Boulder Chamber was also halted after the passing of the squeeze and a number of interesting possibilities still remain. Similarly, passages and chambers near the start of the Long Crawl are of some potential. Correspondence with Gerard Platten and reference to early articles seem to imply that several passages and/or chambers appear to have been "lost". Most interesting was reference to a 30 - 40 ft. rift that was "below the boulders beneath Boulder Chamber" in which the stream could be seen. It was not descended when found and despite several hours of searching in the area I have not found anything resembling it.

Dan yr Ogof II. The greatest interest and enthusiasm has inevitably been in the new extensions. To many it would seem that the most obvious points have been pushed, but in fact there are still many places in both II and III where only a superficial examination has been made and at very few points has there been really serious work. For example there has virtually been no digging done and the constrictions in the Crawl still prevent us bringing in the maypoles which could lead to spectacular advances.

Before becoming more precise, an examination of general aims might be valuable. The two major aims already outlined would both be solved by

direct access to II or III from the surface, and this, as radio tests and the example of Ogof Ffynnon Ddu II has shown is not an impossibility. Dan yr Ogof upper series in particular, is very close to the valley side and to the surface at such points as the 100 ft. cascade. Here, the most recent radio test bears out the virtues of the Birch device and gives an approximate depth of 93 feet of which 20 is open space. Avens in Dali's Delight and behind Monk Hall and Cloud Chamber are also possible surface connections while the chokes at Hangar Passage, Avalanche Corner and Monk Hall may also represent large surface collapses and/or drift infill.

Another major aim in II is to find the link to the Giedd Series. This may well fall to the Club divers in the Lower series, particularly in the Mazeways area, although if the multi-tiered nature of II is continued a dry route through the further parts of the Hangar choke or Avalanche Corner might be a strong possibility.

A. Coase.  
(March 1968.)

#### EASTER PLANS DAN YR OGOF.

Plans for the underground camp and hydrological studies in Dan yr Ogof have reached an advanced stage. Some camping equipment has been stockpiled in the cave at Bat Chamber, the telephone link has been completed to the same point except for the Crawl and the hydrological gear is currently being assembled. The objectives were outlined in the brief note circulated with the last Newsletter. Full implementation of the work does depend on the weather but the main outline of the work is:-

April 6th-11th. Surface survey party from Leicester C.A. levelling and surveying work on D.Y.O. and other cave entrances and the radio location points.

April 12th (Good Friday) - 13th. Surface water sampling and final stores to the underground camp, telephone connections to be completed to the changing hut above the D.Y.O. restaurant where a surface "office-cum-HQ" will be set up. Lab in use for sampling.

April 13th. Sat. Coordination briefing in large common room in Penwyllt 6.30. final program and detailed timing to be established.

April 14th. A.G.M. followed by entry to cave of camping party with personal gear, assisted if possible by volunteers.

April 14th - 17th. Underground camp with dye and radio location tests, surveying, exploration, photography, and if personnel available, diving. Camping party return to the surface Wed. evening or Thursday morning. During this period visiting "day teams" are required to collect sample bottles and films etc. Assistance is required to porter out some of the camp material at the finish although the basic items may remain for extended trips throughout the summer.

Outstanding requirements for assistance on the surface include: (i) "telephone HQ" approximately every 3 hours. (ii) assistance with radio location work with Rod Stewart, (iii) and with water sampling and dyeing with Noel Christopher. Bill Little will be organising one or two day parties and there is the possibility of one or two places on the camp as some people are still uncertain as to their availability on the dates in question. A photographic "blitz" is planned for one day (15th or 16th) and assistants and models will be invaluable in the Far North.

Remember there will always be a cuppa (for the porters) at camp!

A.C.

## CAVING AND COMPUTING.

Computer programming seems to fill most non-mathematicians with horror - it's way beyond them and they could never possibly program a computer. However, all that's really needed is an ability to think clearly and logically about the problem that you want to solve and to write out in computer language the actual steps that you would take if you were doing it yourself. Cave surveying is a particularly tedious task, and even more so the actual drawing-up procedure which can be soul-destroying if the cave is complicated.

In view of the enormous amount of work that we are going to have to do in surveying Ogof Ffynnon Ddu II and III I set about writing a program to handle the computing end. The actual language used is FORTRAN and the program has been tested and used on the ICT 1905, and takes about fifteen seconds to do a hundred stations.

The particular difficulty with writing a cave survey program is that we can have several types of data, depending on the circumstances. First, we can have a line survey from point A to point Z, then we can close a loop, i.e. go from point A to point A via a circular route, and finally we can be following two legs which link together at one point. Not only this, but sometimes it is difficult or impossible to take both forward and back bearings at a station and there is a gap in the data. To facilitate handling of the figures I wrote three programs to make the best of the problem:

- a) Program LINE, for a survey from A to Z.
- b) Program LOOP, for a survey from A back to A.
- c) Program LINK, for a survey from A to P and Z to P.

The difficulty of gaps in the data is overcome by insisting that there are no gaps, i.e. if a bearing is missing then it is to be filled in from its partner. We then use:

- a) Forward bearings
- b) Back bearings
- c) Dip (-ve or +ve)
- d) Distance.

The programs each compute values of X, Y, Z coordinates, starting from the point (0, 0, 0). In the case of program LINE the forward and back bearings are averaged out and this is the angle used in computations for X and Y. For program LOOP the same procedure is used and as well, the closing error is computed and if acceptable, distributed along X, Y and Z according to the various leg lengths. In program LINK if the two lines fail to meet at the same point the closing error is computed and the meeting point is considered to be the "weighted average" of their distance apart (with respect to both leg lengths). In many cases there will be radio-located points to "home onto" and the programs may be altered to accommodate this.

The errors will all be printed out, so that we can make a check to see if they are satisfactory and to ensure that when distributing them we are



not carrying out a fictitious survey - if the error is too large there is no cure but to resurvey...

Fig. 2 gives the logic steps involved in program LOOP just to show what is going on. I also give a set of input data and the computed results from it.

Note that the figures used are only for test purposes, and that the large errors in X, Y, Z are huge compared with the ones that would be met in a real survey (we hope).

<u>INPUT DATA</u>			
<u>Forward Bearing</u>	<u>Back Bearing</u>	<u>Dip</u>	<u>Distance</u>
70.00	230.0	- 5.0	50.0
95.0	76.0	- 1.2	12.5
160.0	340.0	- 3.0	20.5
140.0	322.0	- 7.0	35.0
190.0	10.0	0.0	30.0
230.0	50.0	10.0	62.0
290.0	112.0	40.0	41.0
350.0	170.0	-65.5	89.0
280.0	100.0	25.0	52.0
71.0	250.0	-30.0	130.0
30.0	210.0	- 2.0	50.0

<u>OUTPUT DATA</u>			
Errors in X, Y, Z			
	<u>X</u>	<u>Y</u>	<u>Z</u> (Corrected values)
- 84.0	0.0	0.0	0.0
	35.0	12.9	-36.2
	44.0	11.5	-48.0
	49.2	-11.7	-68.2
	65.4	-44.2	-68.2
	59.1	-79.4	18.6
	1.0	-127.5	63.3
	-12.8	-105.2	27.1
	-88.6	- 96.9	94.1
	-98.7	- 61.4	28.9
	-18.6	- 32.6	0.0
	0.0	0.0	

If there are any surveys that need to be computed I will endeavour to get them done as long as the data is sent in correctly, although I will not promise anything.

P.M. O'Reilly.  
March 1968.

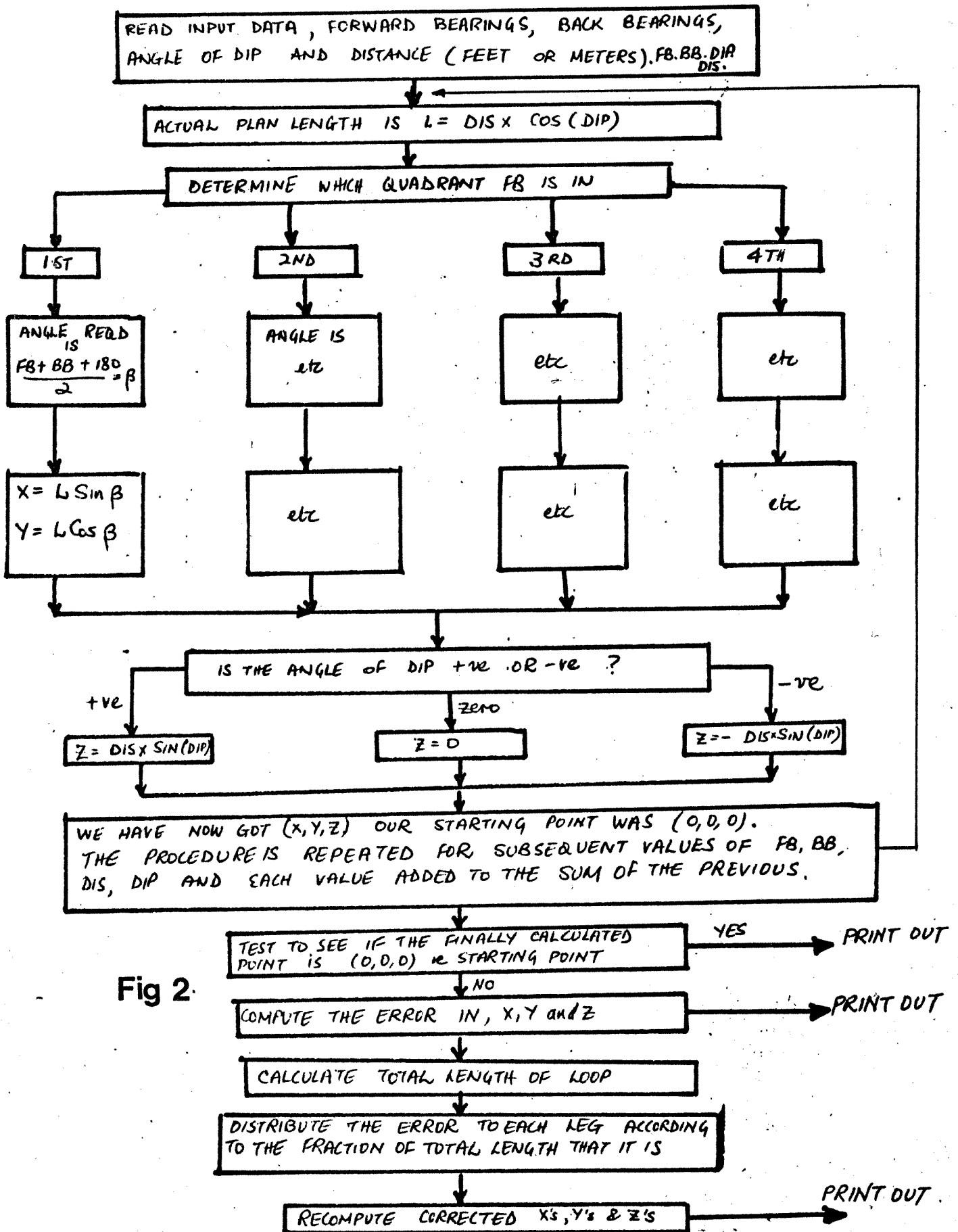


Fig 2.

## A RAMPART TAKEN BY SURPRISE.

Sunday 18th February saw Mike Coburn and Terry Moon kitting up for a dive in Dip Sump with John Oz and Adrian "Yobbo" (a Sub-Aqua friend of Mike's on his first caving trip) as sherpas. Meanwhile, Paddy O'Reilly and Colin Fairbairn were flogging their way through Cwmdwr en route for the 55 ft. pitch from the Dip Sump Series which the divers were going to ladder. Frank Baguley and his slaves were creating a diversion for Smith on Bolt Traverse and the scene was set for Momentous Happenings.

Su Hill and I got to Dip Sump just a few minutes after the other four, craftily avoiding carrying anything, and when the amphibious pair had gurgled their way into the depths we were left with a few hours' spare time. John wanted to show Adrian the Waterfall Series, but I suggested a look at the Coronation Dig known to a few as the Winze - after all, a lot might have happened since it collapsed in 1966 (see N/L 55, Jan. 1967).

A lot had happened! John, who was first there, found the way clear although it was a bit shaky. By the time we had arrived John had already scrambled down into OFD II and he called us on. We all went through relatively uneventfully except for one moment when a boulder tried to make a nest in Adrian's helmet.

Once safely on the other side we decided to press on and complete the through trip, especially as climbing back up through the Winze would be very tricky. On we went, chortling with glee, and met the others near the top of the 55 ft. pitch.

"Ho-ho", said John, "We are going out through CwmDwr". Paddy's face fell and he swore in Gaelic or something - he and Colin had intended to go through the Winze and to do the first through dry trip. "Never mind," we said, "You can still go through and help sherpa the diving gear back out." So we left.

We had only just emerged from Cwm Dwr a few minutes and were settling round the entrance supping tea, when Colin's sweating face popped out of the pipe. He and Paddy had gone to the Winze, spent half an hour debating the balancing properties of large boulders supported on liquid mud and thought better of it. They returned, and abseiled down the rope which we had considerably left on the 55 ft. pitch for just such a decision.

The following weekend Paddy and Colin had their revenge on both us and Smith. They and John, reinforced by Colin Graham, entered the system at Y Grithig, ceremoniously dipped their toes in the pool in Gothic Passage and left via the entrance from Clay Series three and a quarter hours later, completing a through trip of about 800 feet in depth.

NOTE: Would-be record breakers please note that the Winze is in an extremely unsafe condition - it is even probable that the whole lot has fallen in again so treat it with respect - in fact it would be better if it was allowed to settle altogether - in the event of a callapse the rescue of anyone injured would be through Dip Sump.

Bruce Foster.  
(March 1968).

## THE FIRST RIVER CHAMBER - OFD II.

When the Cwm Dwr - OFD II route became available, Cardiff University parties joined the stream of tourists who poured in and out of the new cave. In the course of exploring the Mainstream a phreatic type passage in the north wall of the stream was entered by Idris Williams. The passage led to an extensive, if little visited, series.

The First River Chamber as its name implies is the first widening of the river passage above the Confluence in OFD II, immediately beyond the 12 ft. cascade. The chamber is formed along a fault which slopes vertically at 80 degrees to the east and there is no evidence of vertical displacement. The fault is approximately N-S ( $6^{\circ}$  -  $186^{\circ}$ ) which does not correspond exactly with the major joint pattern in this area. From the boulder-covered floor of this chamber a shaft can be seen in the roof which seems to follow the fault plane.

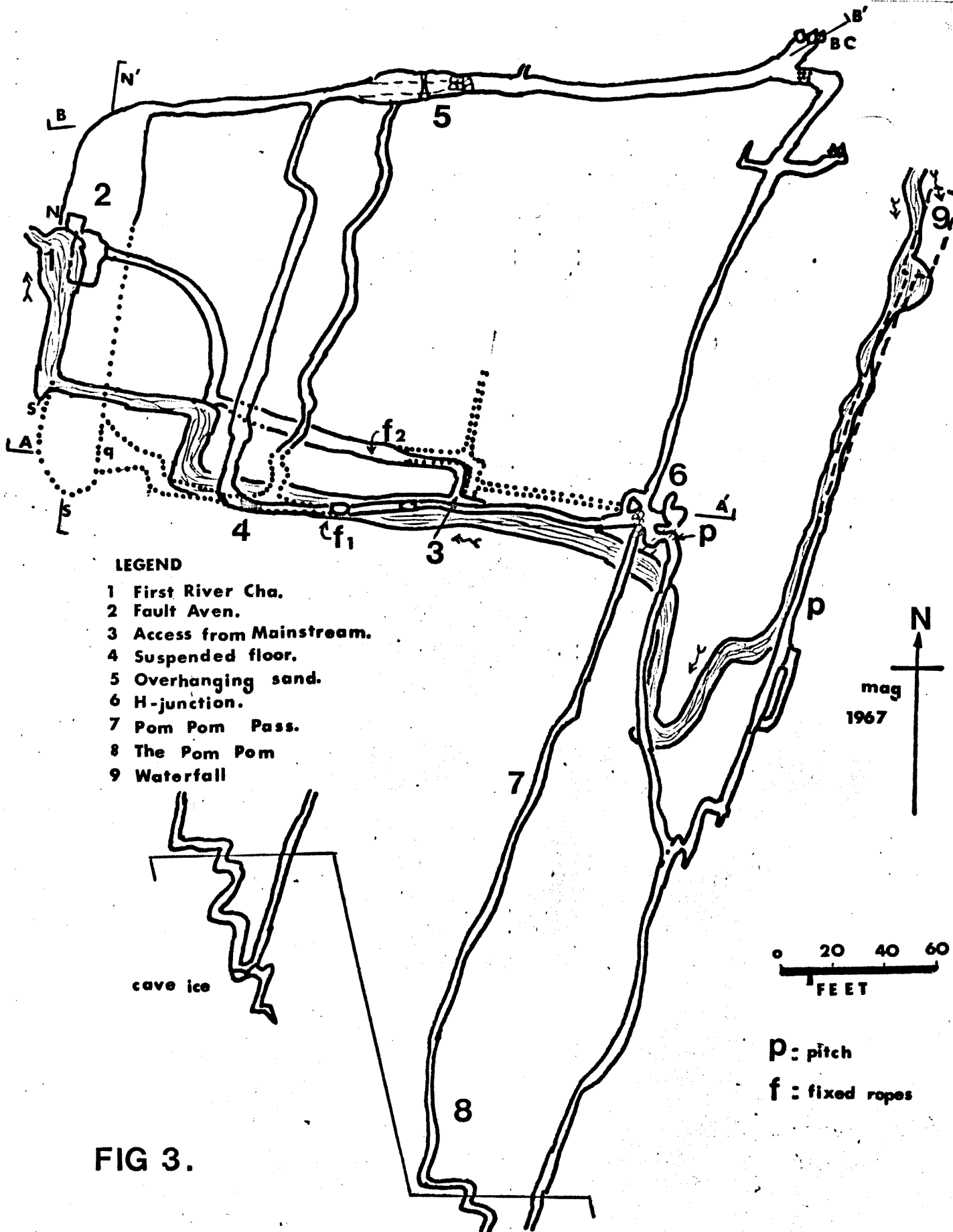
A series of short phreatic passages on the north side of the Mainstream, entered about 100 yards upstream from the chamber, gives access to a ledge in the bottom of the shaft in the roof. The east wall of the shaft slopes at approximately  $80^{\circ}$  and the northern side consists of a 60 ft. pile of boulders cemented with clay. Thirty feet above the ledge the compact slab wall on the eastern side gives way to a brecciated area which halted progress. Thirty feet higher, however, the boulders broke back and one sensed an enormous space.

A small aven in the phreatic access passage was climbed and in turn led to a system of phreatic tunnels and rifts above the mainstream. The western end contains a fine suspended stal floor which once lay upon a sand choke, but the sand has since been washed away. The right-angled bend that this choke occupied leads straight up-dip to emerge at floor level in a rift passage of fair proportions. The Mainstream can be heard to the left and following the sand one emerges into the enormous space above the first River Chamber, Fault Aven.

The floor at this point consists of choked boulders which are piled back from the north end of the shaft from the First River Chamber. The east wall slopes at about  $80^{\circ}$  or so, again at  $6^{\circ}$  -  $186^{\circ}$  N/S. The southern wall extends upwards to a boulder slope and without a concentrated beam the roof is out of sight. At about 100 feet above the floor (200 above the Mainstream) a huge rock bridge spans the width of the aven - about 30 feet. Retracing steps to explore the rift passage in the other direction one is shortly halted by a choke of sand about sixty feet high in the narrow rift, overhanging its base by about twenty feet. The top of this choke is composed of jammed boulders which seem to support the sand on the overhang.

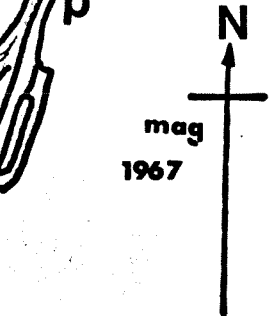
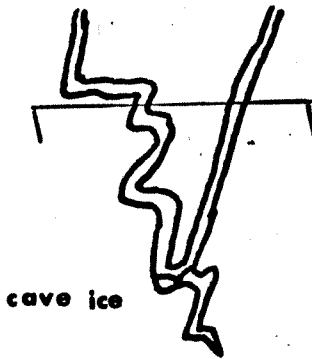
The rest of the series consists of two passages following the main joint pattern, one above the Mainstream at high level, the other off to the west. The eastern passage starts from the aven in the Mainstream with the big waterfall just 50 yards south of the Marble Showers. In actual fact this aven can be reached from the Marble Showers Series too but the traverse across has not been made.

The southern end of Pom Pom Passage contains a fine crystal floor



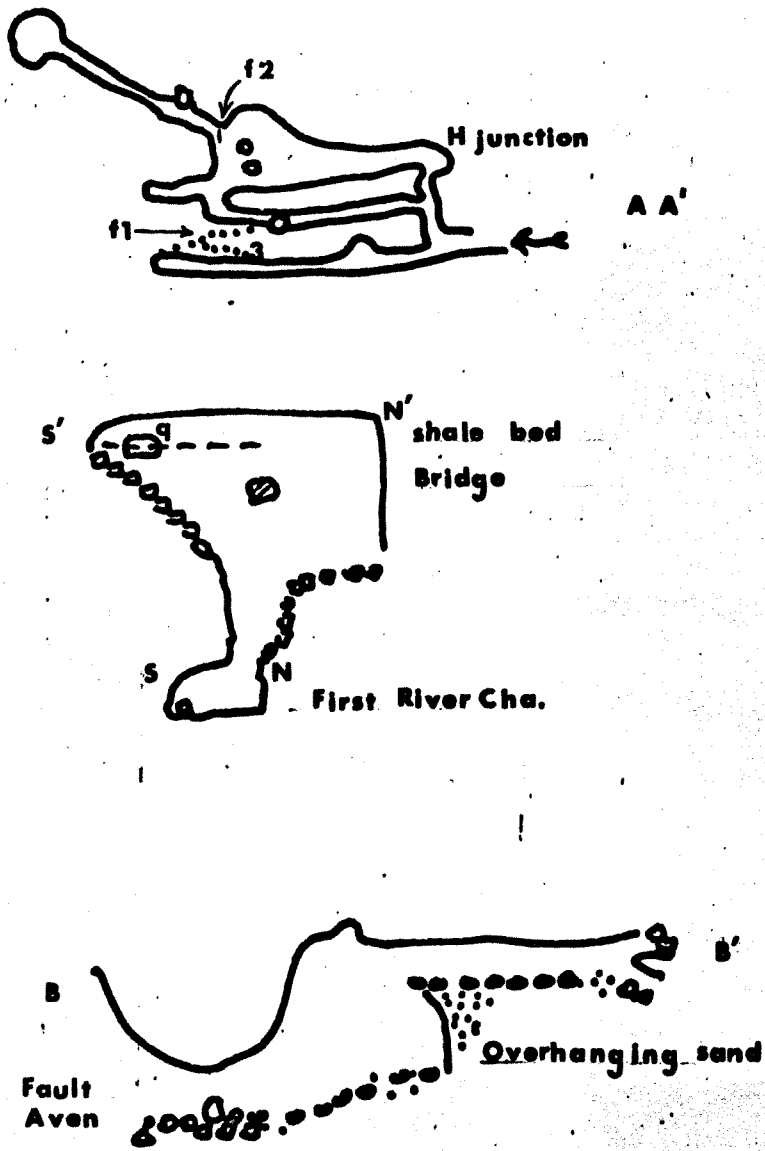
**LEGEND**

- 1 First River Cha.
- 2 Fault Aven.
- 3 Access from Mainstream.
- 4 Suspended floor.
- 5 Overhanging sand.
- 6 H-junction.
- 7 Pom Pom Pass.
- 8 The Pom Pom
- 9 Waterfall



p: pitch  
f: fixed ropes

**FIG 3.**



Sections not to scale

FIG 4.

including a pool which has a ball of crystal suspended on a two foot long straw (the Pom Pom). H-junction is recognised by a braided straw shaped like a backwards 'h'. The two boulder chokes near here are very near the Marble Showers Series but possibly slightly west of passages known so far.

Climbing in the rift between h-junction and the suspended floor leads to a phreatic tube at roof level - a fixed rope is in position but should be used with care. A junction at 20 feet gives two ascending passages, one of which arrives at high level by way of the overhanging sand, the other at roof height in Fault Aven at the level of a shale band one or two feet thick. The roof here is of oolitic limestone.

The system as a whole displays phreatic features at low level with recent vadose influences. The presence of oolite blocks on the floor of the First River Chamber and the general nature of the aven above indicate that at some time the Mainstream was choked, causing water to back up considerably. The phreatic low level side passages and the two sand chokes seem to argue in favour of periodic, if not permanent, flooding. However, such conclusions are of a speculative nature and are offered only in the hope that cavers may look more objectively if and whilst passing through this interesting sector of the Mainstream.

M. Day.  
(March 1968.)

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#### GREAT OXBOW SERIES.

That well known armchair caver J.V.O. was sitting in the small common room at the Club one day studying the survey of OFD when he suddenly jumped up and said that there must be some undiscovered cave between the end of Midnight Passage and the Marble Showers Series. After spending the morning of Sunday, March 17th (St. Patrick's Day), cleaning out the septic tank a party of three, J.V.O., Dave Felton and I, set out to purify ourselves in the clear waters of OFD II. Our objective was to traverse out from the end of Midnight Passage and along the top of the Great Oxbow Rift. John lost his leaders badge on the way in but regained it on the traverses.

After an 80 foot traverse a round passage was entered which seemed promising. It led back, however, to a rift and after some more traversing a passage was noticed twenty feet above on the right. John climbed to the top of the rift but could not quite manage to get into the passage so he proceeded to try and lasso a boulder in the entrance - this he succeeded in doing after many frustrating tries. Dave (poor bloke) "volunteered" to climb the rope much to our relief. A ladder was tethered at the top and we went up to join Dave and found ourselves in a sandy floored passage. This we followed for over 600 feet; in places the passage broke out into the rift again, necessitating more traversing. Climbing down for twenty feet we found ourselves on a platform of boulders above the Mainstream. John climbed down to it and found that he was only twenty feet upstream of The Last Pot That Has To Be Swum Just Before The Great

Oxbow. Dave traversed above the mainstream for about 100 feet and I had a look at a small passage on the right with a small stream in it. As time was pressing we did not want to cause a rescue so we retraced our steps. Just before the climb down to the traverse a phreatic tube on the right was climbed but was not pushed because of shortage of time.

The following Friday evening Gerald Davies (from Swansea) and I returned to this tube. It led to a maze of tight tubes so it was abandoned. After climbing back down I stuck my head under a low arch and saw another almost vertical tube. This we climbed to a height of 55 feet in two stages and then after a 60 ft. crawl we emerged into a larger passage.

To the right is a canyon type passage about ten feet high with a flowstone floor. This gradually drops in height till after 400 feet a muddy sump is reached. To the left the passage passes two deep rifts and then it bifurcates (i.e. forks). The larger passage on the left enters a deep rift at right angles after 200 feet and could not be entered. A small stream enters from the right out of a 70 ft. high aven and disappears into the rift. Back at the bifurcation the other passage deteriorates into a narrow rift which after 400 feet ends in a traverse over a deep pit into a larger passage. The right-hand way is a ten foot diameter tube with a white flowstone floor in parts (BOOTS WERE REMOVED) and deep mud in others. This leads either to a rift (left) or to a sump (right). The left hand way ends in a boulder choke beyond a pot. There are also two short passages which end in chokes.

Mike Coburn and I returned on Saturday last and made a Grade 3 survey of the series. We also traversed further downstream for about another 100 feet from where Dave Felton had stopped previously - we could have gone further but the roar from the stream in flood ruined concentration, i.e. I was scared.

Colin Fairbairn.  
(March 24, 1968).

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#### BOOKS

The Snowdonia National Park - W.M. Condry. New Naturalist 47 - Collins 1966.  
238 pages. 30/-.

Minera by G. Davies - 1964. Publ. from Ty Brith, Minera, Wrexham.  
(On the lead and stone mines of Minera.)

Nicholl's "Forest of Dean". Dawlish, David & Charles. 1966, 82 pages. 50/-.  
This is a reprint of two books:-

- (i) The Forest of Dean, Historical & Descriptive Account. 1858.
- (ii) Iron Making in Olden Times, as instanced in the ancient mines and furnaces of the Forest of Dean. 1866.

Lead Mining in Wales. W.J. Lewis. Univ. Wales Press. 50/-.

Caves and Caving. M. Jasinski, W. Maxwell. A little Guide. Publ. Hamlyn. 5/-.  
(A pocket version of "British Caving" really - good value).

Geographical Magazine for June will contain an account of Dan-yr-Ogof by A. Coase.  
It will probably be available mid-May. (Do you require reprints?)



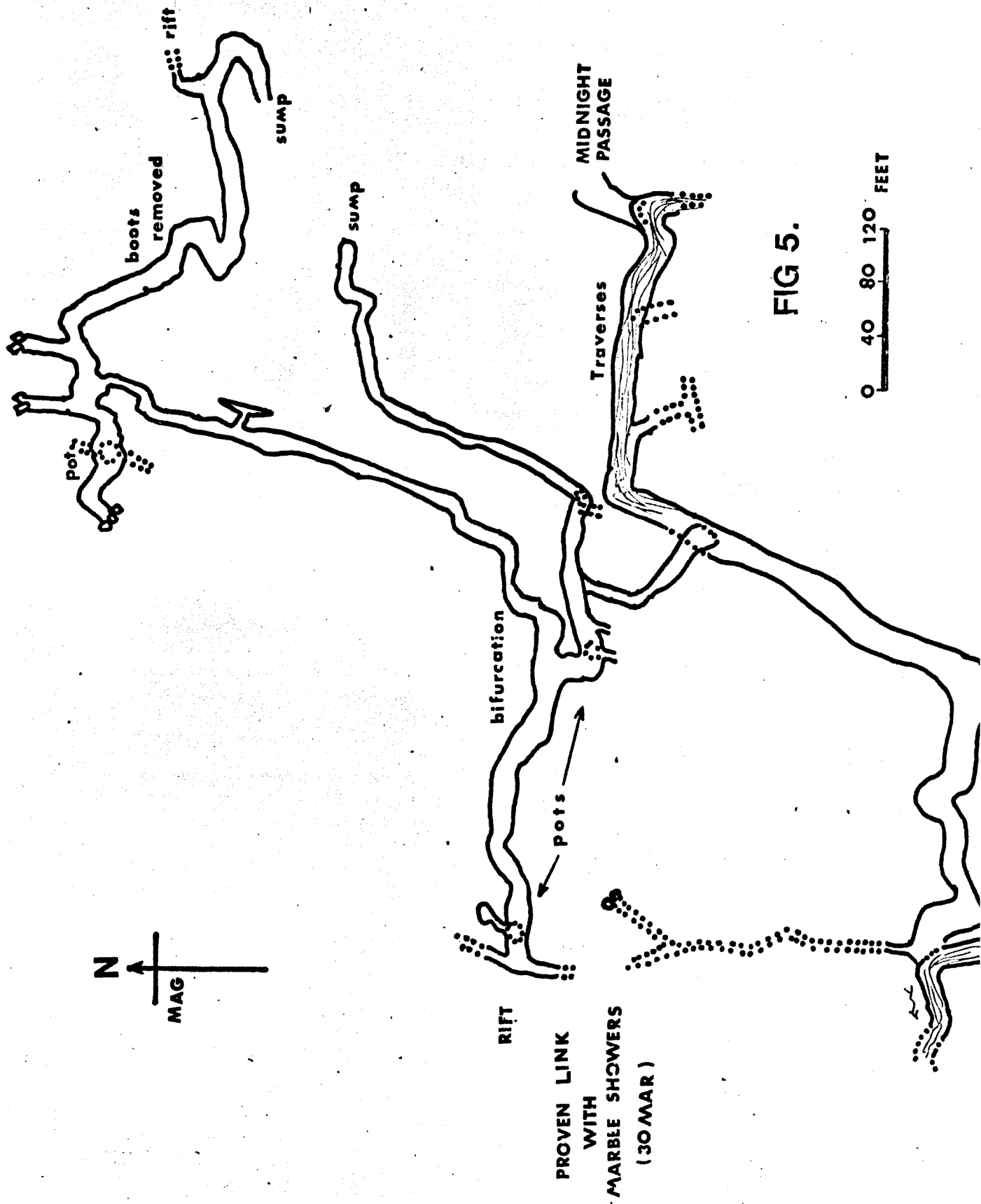


FIG 5.

## LETTERS TO THE EDITOR.

Dear Sir,

It was with great interest that I read W.H. Little's letter in Newsletter 58. I find myself in full agreement with his main theme, that this Club should take an active part in the formation of a regional body for South Wales and a National Council for Speleology. It was sad that you, Sir, had to follow it with a note about it not being Club policy. Surely this is implicit in most of the material comprising a publication such as this one.

The attitude of our good Committee (at the present moment), seems to be one of, "We are alright Jack". Is this good enough? They apparently sit back complacent whilst every week-end several miles of Britain's finest cave passages are being wantonly ruined by any Tom, Dick or Blodwen, for whom we have kindly provided an entrance, possible even to five-year-olds. The amount of cave waiting for us to discover is far from being infinite. The more that this generation of cavers discover, and the more that we destroy, or allow to be destroyed, the less we leave to the future generations.

I consider that the greatest achievement of this Club in its 21 years of existence has been the preservation particularly, of two of Britain's finest caves: Dan-yr-Ogof and Ogof Ffynnon Ddu. I was heartened to read recently an article inspired by the visit to S. Wales of a party from Yorkshire, (J.C. Whalley; Journal Craven Pothole Club; Vol.4; No. 1, p.76), "Some of our members are deterred from visiting S. Wales when they hear of the access restrictions. These are not unreasonable ..... The exclusion of undesirables, the ban on carbide lighting, and the almost fanatical litter consciousness in Dan-yr-Ogof pay off in an astonishingly well preserved cave". As one who caves regularly in most of the caving areas of Great Britain I am in a position to appreciate this success more than most of our members. It is therefore especially annoying to see O.F.D. II following closely on the heels of Gaping Gill / Bar Pot and the Lancaster / Easgill System.

To get back to National and Regional Bodies, surely we have much to transmit to cavers in other regions, and much to gain from their differing experiences. Things may, or may not be alright in South Wales at the present moment, but we would do well to contribute to the improvement of the national image of the British Caver.

What sort of fraternity is it that allows the bodies of six of its number to remain in the middle of a cave passage at the exact spot where they drowned, whilst attempting to increase our knowledge of one of the most fascinating cave systems in Europe? Is there any other known cave system which possesses a passage over a mile in length which is half in limestone and half in coarse gritstone? Yet this has happened, and the cave has been legally sealed by a coroner. One hopes that had we then had an effective and responsible national body, capable of speaking at Home Secretary level, this crime would never have occurred. (Please read, Letter from Alan Fincham "Mossdale", C.R.G. Newsletter No. 109; Dec. 1967; p.30-32.)

A positive and integrated approach to such outfits as Adventure

Centres and school caving clubs is only one more of the many benefits that might accrue from a well-run system of regional and national bodies, as opposed to the negative attitude which our Committee has found itself forced to take, (J.V. Osborne; "Caving as an Adventure Activity", Newsletter 58, p.21-3).

Committee, let's have less of these worn out fears of loss of identity; let us take our full share in the setting up of a regional body for South Wales, and ultimately a National Council for Speleology.

Yours sincerely,

David M. Judson.

Redditch.  
March 1968.

Dear Sir,

Nationalisation is with us again. There is a move afoot to regiment and organise caving and make it a "respectable" sport. In the last Newsletter Bill Little makes an impassioned, if irrelevant and superficial, appeal to be "with it" and to obtain "recognition" of caving as an outdoor activity. The headlines in last week's Daily Telegraph tell of "Potholing Without Peril" and even Bill Maxwell's new book tells us what to do in every sort of emergency. Councils move closer and closer together and we are rapidly approaching the state of American caving where clubs lose their identity as numbers on a list, or France where it is virtually impossible to cave without multiple documentation. Bill urges to "start acting now" as "Other regions cannot speak for South Wales ...". Speak to whom and about what...?

I regret this increasing trend in this country towards "those who know best" making the decisions - in many cases it is those who know least that make them. Mendip and Yorkshire caves are sealed off to prevent "unqualified" cavers from entering them. You practically have to be certified in six copies to be allowed to cave. The clubs in these areas are "organised" and are giving their support to these attitudes. It is in these very clubs that you would expect to find the keenest appreciation of the other values besides safety and organisation, such as the value of pushing yourself to your own limits underground, and to the value of making your own decisions as to what those limits are. I have no objections to any organisation deciding on any strict standards of safety - they may even have the rather dubious value of demonstrating to the public that caving is not necessarily as dangerous as it is made out to be - but I think it wrong that any organisation should attempt to impose its standards or attitudes on everyone else.

Conservation is the personal responsibility of everyone who enters a cave and those who shout loudest are usually those who do least about it. Communications are in a similar position - too often people decry the lack of suitable caving literature, but when the opportunities arise to contribute either financially or literally they are the very ones who don't bother. Infor-

mation exchange is the personal interest of the few and it will always be so  
- National Councils or no.

Cavers demonstrate their individuality and independence from the standards of the public by the very fact that they cave at all. Perhaps there is more to caving than the now proverbial "because it's there". Certainly there is a "there-ness", but there is a cellar below my flat and I have no particular desire to explore that. No it's more an "it-ness" - we are attracted more by caves and what they mean - water, wetness, rock, boulders, climbs and above all danger and absence of organisation. A man needs physical danger - in this civilization we make a fetish of removing all traces of it - of covering all the possibilities with insurance policies, of organising, of regimenting, of certifying. Man daily protects himself more and more from danger and loses something important, whether he knows it or not.

I think over-concern for safety is a mistake in any activity. It may seem a contradiction to the outsider for cavers to be preoccupied with safety - historically we have kept well away from what is safe and secure - indeed we should all have an excellent safety record if we had all stayed at home in bed - the truth of the matter is that part of the essence of caving is to push one's self to the limits. Inevitably one takes risks, otherwise they would not be one's limits; when you have walked the feather edge of danger with someone, holding his life on the end of a rope and later he holds yours, you have an almost impregnable foundation for a friendship - the sort of friendship that will not spring from the knowledge that he has a certificate approved by such and such a committee of caving clubs. The people with whom you have caved this way, the people with whom you have shared the tensions and afterwards the proud feeling - they make up a very special group; you live, the rest of the world exists, in its mumbling committees and mincing political minuets. Is this the bitter strife and parochial selfishness that Bill so despairingly deplores? Is this what we want replaced by Organisations and meetings and "leadership" that "caving in this country has needed for several years"? I think not.

"Recognition" by the public is the least important of all a caver's values. The public have reacted subtly to our disregard of their standards by the constantly reiterated puzzlement and more often by direct criticism of "irresponsibility". Eventually many cavers seem to feel guilty that they are cavers, that they enjoy what no "sensible man" would enjoy. That guilt leads them to try to become respectable. They wish to prove that, after all, caving is really very safe and they become disturbed every time there is a national publicity about another accident. With almost self-righteous indignation they assert that those fools shouldn't have been where they were in those weather conditions. The accident could have been predicted. They become almost frenetically concerned about the "public image" of caving. And yet when an accident happens they take all the risks they like to take, even unreasonable ones, and are approved by public opinion - they are heroes. Personally, I cannot see why the public image of the caver has any importance at all - no one caves in order to be popular - so why not let the public condemn the activity as much as it pleases? I tend to believe that the lack of security, safety and organisation are so integral a part of caving that unless one walks the feather edge of one's own limits it is not worth doing.

Nonetheless I will practice the tolerance I insist upon for myself - if others find sufficient values in organised caving without any danger at all, why should they not pursue it in that manner? They should. BUT let them not try to impose their view, directly or indirectly, on all other cavers.

Yours sincerely,

P.M. O'Reilly.

Swansea.  
17 March 1968.

Some comments from letters on the 21st Anniversary Publication:-

- (a) From Mel Davies:  
"The Publication is marvellous, and a monumental piece of work for someone in editing ..."
- (b) M.M. Shaw:  
"Thanks for the Publication - a fantastic job done. Please would you send me another copy ..."
- (c) J. Hartwell:  
"It's a jolly good publication Paddy ..."
- (d) A. Kirk:  
"The long awaited tome arrived today... The copy is faulty having had its cover fitted to the wrong edge and inverted, so the whole thing is inside out, back to front and upside down! (and quite funny to try to read pending repairs)... Faulty copies should be half price!... Apart from these minor faults... it is a jolly fine effort and MOST interesting and informative, unlike most Club publications it appears to contain no WADDING... I shall be recommending it to my friends as a worth while buy and a desirable addition to any caver's library."
- (e) E. Aslett:  
"It's a good publication - congratulations again ..."
- (f) M. Duerden:  
"I seem to have some good reading in front of me. Congratulations to all who put it together..."
- (g) E. Casey (non-member):  
"I should like to congratulate S.W.C.C. on the production of this memorable volume."
- (h) R. Flaherty:  
"...It's excellent reading. So much so, that I've done very little work today!..."
- (i) L.G. Bray (non-member):  
"... It is well worth 25/-..."
- (j) A.G. Watts: (Editor Y.R.C.)  
"I have much enjoyed your 21st Anniversary Publication. May I point out one slight error. In the coordinates of Balinka Pit, ought it not to be 15. 26'.31"E, not 14? 14 puts it in the Island of Krk!"

(k) J.D. Aldridge:

"Fused Flanges forsooth!...Thanks for the two magnificent anniversary bumper fun books...Are you setting up a giant publishing house? Actually giants soon get out of date, and the ones I know don't really like being published at all. In spite of their enormous birth and greadth they are rather shy especially on the subject of causeways you know. All that must prove something or nothing, depending on the humidity and how you look at it. While making a detailed study of giants I have come to the conclusion that it would be a bit extravagant to have a 3rd copy of the 25th Ann. Pub. as I ordered. Since you have sent me only two and I sent £2. 8. 0. and have expended £2. 3. 0. I have decided to send you another 5/- for a Dan-yr-Ogof Survey instead. I think there is an extra sixpence there to allow you to buy a large sticky bullseye. I presume this is available (the Survey, not the bullseye)....

P.S. POST POSTERIUM\*

\*When pronouncing this word the bowels are to be sounded in the normal way....."

HAVE YOU GOT YOUR COPY OF THE PUBLICATION YET?

THERE ARE ONLY 80 LEFT.

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THOMAS, Gwyn, 4 James Park, Kilgetty, Pembs.  
THOMAS, Glyn, 40 Dan-y-Graig, Pantmawr, Whitchurch, Cardiff.  
THOMAS, R.S., 21 Gate St., Gwaun Cae Gurwen, Nr. Ammanford, Carm. S.  
THOMSON, D.M.M., Dr., Pinkacre, Leigh-on-Mendip, Somerset.  
TONKIN, G., Mr. & Mrs., Blaensylgen, Conwyl Elfed, Carmarthen.  
TOYE, W., Mr. & Mrs., 64 Leatherhead Rd., Ashted, Surrey.  
TRATMAN, E.K., Prof., Penrose Cottage, Burrington, Nr. Bristol.  
TRUMAN, J., 74 Clare Rd., Stanwell, Middlesex.

W.

WARWICK, G.T., 47 Weoley Park Rd., Selly Oak, Birmingham 29.  
WEBLEY, D., Mr. & Mrs., 39 Heol Isaf, Radyr, Glam.  
WILLIAMS, D.R., 11 Tyle Teg, Burry Port, Carm. S.  
WILLIAMS, I.J., 13 Caemdwr Rd., Rhiwbina, Cardiff.  
WILLIAMS, J.G., Dr., 2 Brynbarw, The Parade, Porth, Glam.  
WILLIAMS, R., Dr., 17 Wilson Court, Merthyr Tydfil, Glam.  
WILLIS, D.A., 3 Derwent Lodge, St. Phillips Ave., Worcester Park, Surrey.  
WOODFORD, T.A., 6 Hurst Park Ave., Cambridge.  
WOODS, B.J., 10 Riverside Caravan Site, Great Somerford, Chippenham, Wilts.

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### 3. CAVING AREAS.

#### (i) General Geology.

Topographically the most significant features in Gower are the elongated ridges of Cefn Bryn, Llanmadoc Hill, Hardings Down and Rhosili Down which reach up to 600' in height. The rest of inland Gower is an extensive plateau surface, 200' above sea level, originally a wave cut platform and uplifted in Tertiary times.

Structurally, Gower is a remnant of the American-fold system - those extensive earth movements which occurred after the Carboniferous era. A line running from the N.W. tip of Gower to Oystermouth in a W.N.W. by E.S.E. direction separates the Carboniferous Limestone outcrop in the South from the Millstone Grit to the North.

To the north of the line the rocks dip to the North, sometimes steeply and in places there is minor overturning. There is no major folding to upset the distribution of the millstone grit and Coal Measures. South of the line, however, there is a good deal of folding. The axis of the folds runs from W.N.W. to E.S.E.

The anticlines of the folds bring the old Red Sandstone to the surface and the synclines preserve small areas of millstone grit. These outcrops of old red sandstone and millstone grit occur in an area of limestone. The folds tend to be asymmetrical with the northern limbs of the anticline tending to be steeper suggesting that the push came from the South.

In Gower, Anticlines are frequently accompanied by parallel faults which frequently replace the northern limbs of the folds. The folds are also crossed more or less at right angles by cross faults, the majority of which can be shown to be tear-faults. It can be shown that the folding and faulting took place at the same time.

The dominant element is the compound anticline of Cefn Bryn, continuing west into Llanmadoc Hill and eastwards where the structures become more complicated through faulting. Southwest of Cefn Bryn are two down-folds - the Oxwich and Port Eynon synclines, both pitching eastwards and both retaining outcrops of millstone grit. They are separated from each other by the Oxwich Point anticline and of the two the Oxwich syncline is wider and shallower. Rhosili and Hardings Down are anomalous anticlinal structures, away from the dominant N.W.-S.E. tectonic trend in Gower.

The upland masses are of Old Red Sandstone comprising firstly lower strata of brownstones and marls which can be seen in quarries on Cefn Bryn. Then there are the "Plateau beds", so called because they form the flat tops of the Brecon Beacons. The Upper Devonian is a conglomerate with red and white quartz pebbles up to 3 and 4 inches across and well exhibited in the stone walls of Reynoldston village.

The majority of Gower, apart for a small patch of Triassic rocks at Port Eynon, is Carboniferous in age, mostly and fortunately the Lower Carboniferous limestone.

The Lower Carboniferous has been divided into zones by Dixon and Vaughan on the basis of fossil sequence and lithography which reflect the different facies or local environments. Important cycles in the deposition were associated with the alternation of a lagoon phase and a comparatively deep water phase. Periodically the sea flooded extensive flat areas to a shallow depth where free communication with the outer sea was limited. Then conditions were not suitable for the typical brachiopod and coral fauna and were replaced by lamellibranchs - chiefly *Modiola*. Rocks formed under these conditions were more uniformly fine grained than the "standard" limestone and could be referred to as "calcite mudstones". Lagoon phases are manifested in the K zone, the base of the C2 S1 zone and the top of the D zone.

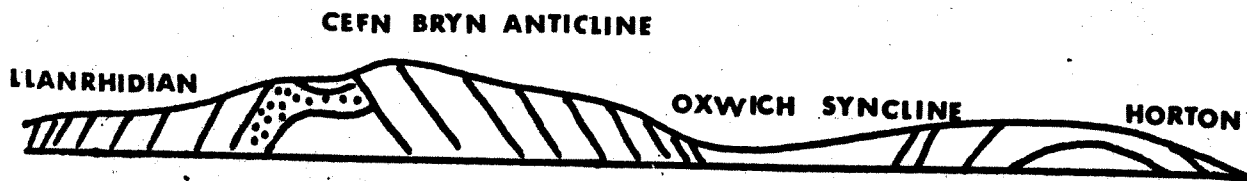


FIG 1.

Zones of the Lower Carboniferous

				Approx. thickness in Gower (in feet)
Lower Carboniferous	Upper Avonian	(Dibunophyllum Zone DD)		800
		(Main Seminula Zone SS2)		11000
		(Upper Ganinia Zone C2 S1)		6600
Lower Carboniferous	Lower Avonian	(Lower Ganinia Zone C1)		6600
		(Zaphrentis Zone ZZ)		300-500
		(Cleistopora Zone KK)		5500

((Cleistopora Zone also known as Lower Limestone shales while the top of the Dibunophyllum Zone (D3) is the Upper Limestone shales)



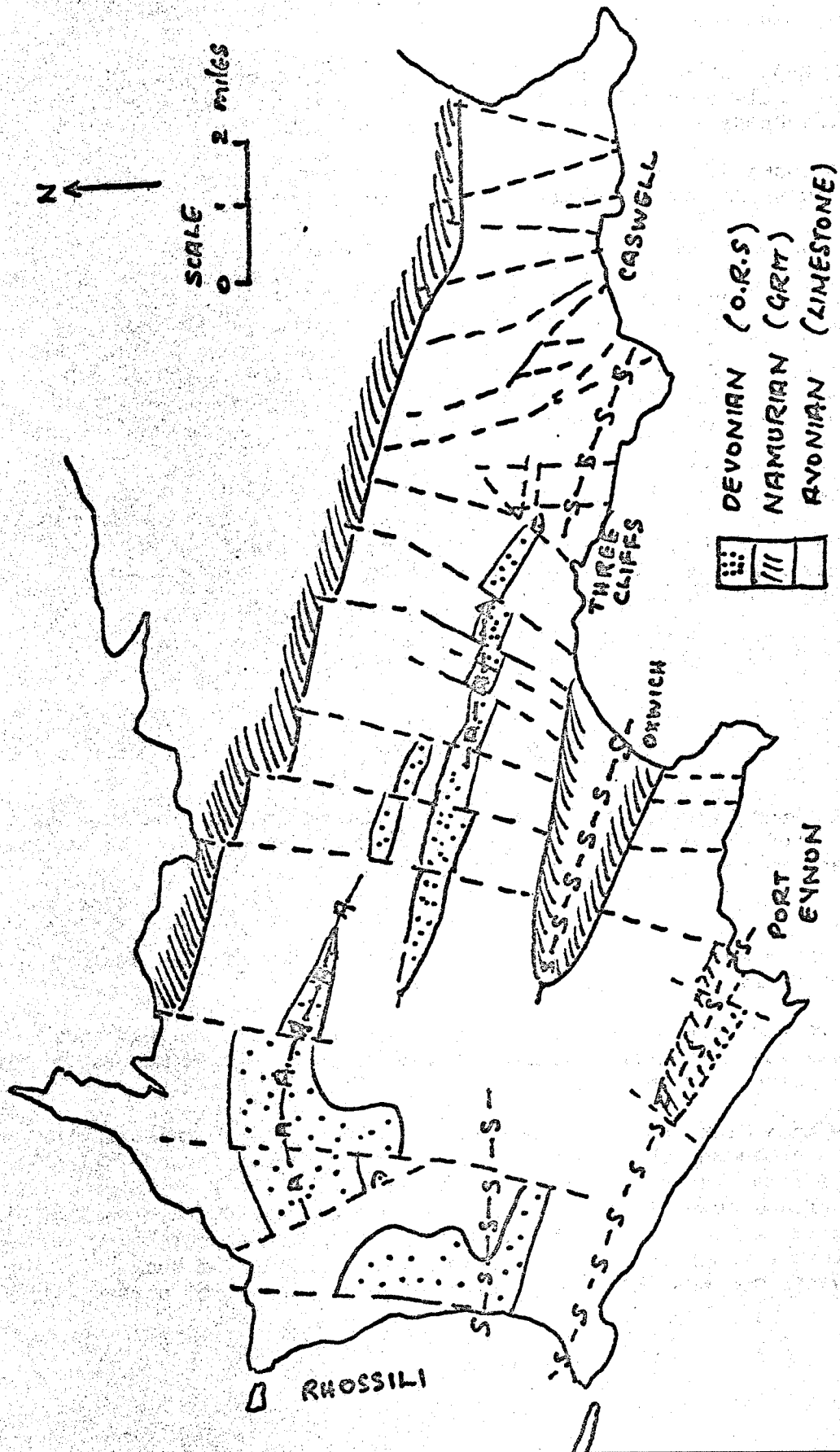


Fig 2 SKETCH OF GEOLOGICAL STRUCTURE OF GOWER

The lowest K zone is composed of shale beds alternating with thin limestones. Many of these are impure and often weather to rottenstone. Like the other zones it is named after a dominant fossil - Cleistopora is the only coral species.

The Zaphrentis zone is a highly fossiliferous crinoidal limestone which becomes highly dolomitic in East Gower where it is associated with a decrease in thickness - from 500' in S.W. Gower to 300' in E. Gower.

The zones C1 and C2 S1 are of similar thickness both highly fossiliferous with C1 having dolomite and oolite on the top.

S2 is mostly massive, coarse oolite of which many beds show false bedding. This zone is the thickest in the series, and considerably thicker than in the North Crop where it is only 400' thick. Similarly the D zone is 800' thick in Gower and only 200' at Penwyllt. It contains crinoidal limestone and pseudobreccias (D1 and D2) and the topmost beds (D3) are known as the "Black Lias" of Gower or the Upper Limestone shales. Here, the muddy limestones are frequently weathered, as at Bishopston, by leaching out of the calcium carbonate, to form rottenstone.

Above the limestone, of course, is the millstone grit, composed mainly of dark shales. The main belt in Gower stretches from West Cross on the outskirts of Swansea to Whiteford Burrows in N.W. Gower. It has also been preserved in the Oxwich and Port Eynon synclines where the sea has eroded deep bays, leaving the residual, upfolded limestone headlands of Oxwich Point and Port Eynon Point.

#### (11) BISHOPSTON VALLEY.

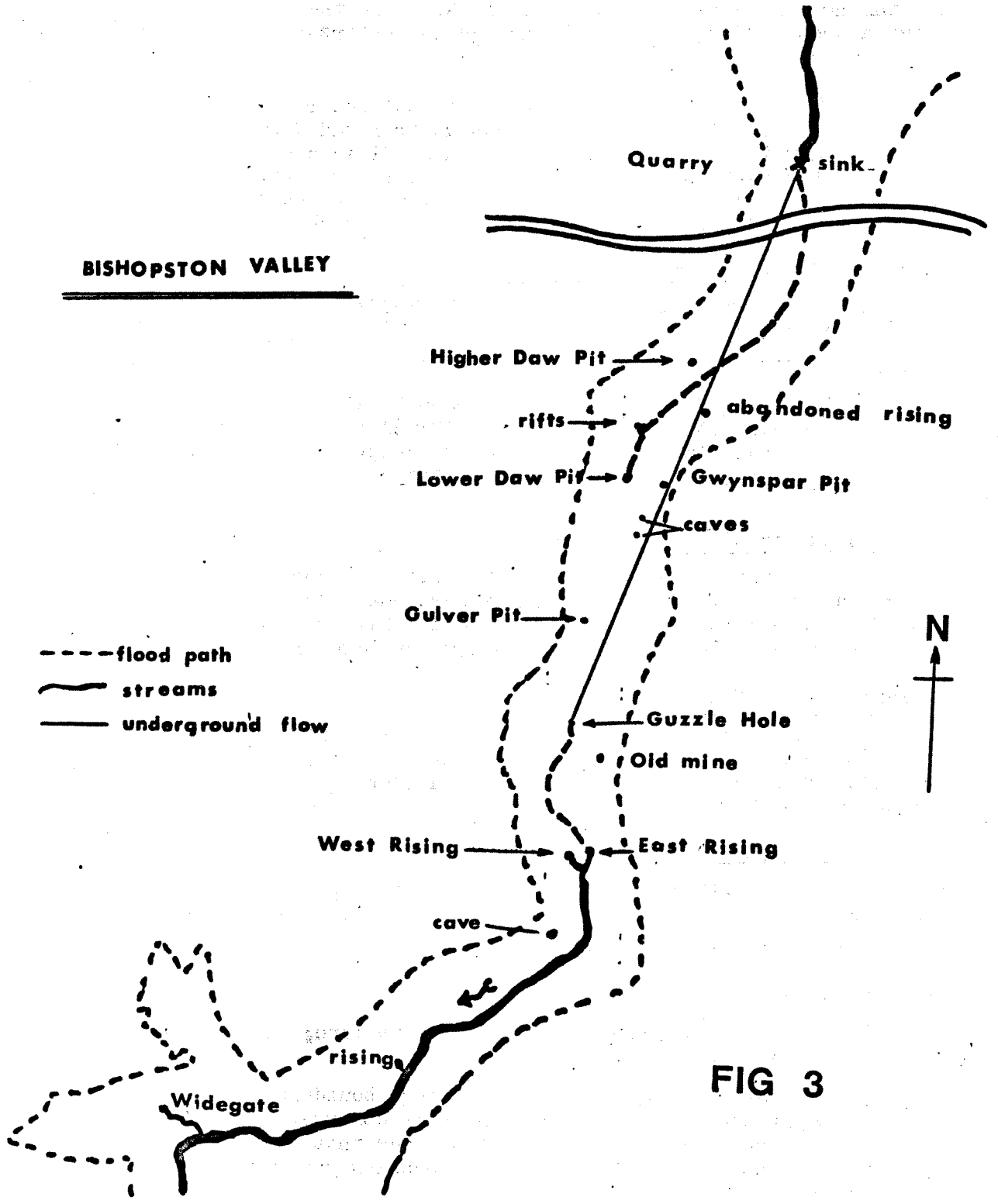
Bishopston Valley is a narrow gorge running inland from Pwll Du Bay for a distance of one and a half miles, the land is owned by the National Trust, and has several interesting features.

##### Hydrology.

At the head of the valley is to be found a stream that drains large areas of Barlands, and Fairwood Commons.

Where the stream meets the limestone-grit boundary at Barlands Quarry it sinks (Barland Quarry Sink), dye placed in this sink was later seen in Guzzel Hole Cave, and in both the Bishopston Valley Risings.

Barlands Sink, however, does have limited drainage capabilities that are often exceeded, the excess water will then flow down the valley to sink in one or more places depending on the quantity. Near the Higher Daw Pit are to be found several sinks in the stream bed; these drain some of the water, whilst 150 ft. downstream from this area, a considerable quantity of water is lost through the bed of a deep pool in the stream bed. If the quantity of water exceeds the capabilities of these sinks, the stream will



**FIG 3**

then continue on its overland course until it reaches an area situated 190 ft. upstream from the Lower Daw Pit, where numerous rifts in the stream bed are located. On one visit to this spot, it was noticed that one of the rifts was taking considerable quantities of water, so the stream was diverted, and after a spot of digging a small passage was entered; this soon became impassable due to boulders.

The final sink in the valley is the Lower Daw Pit, after pouring over the lip of the pit the water goes underground down through huge boulders and mud under its southern wall. Flood conditions are sometimes so severe that even the Lower Daw Pit fails to take all the water. In these conditions the Pit becomes a swirling whirlpool and the water flows down the valley towards Guzzlehole - a truly tremendous sight.

#### Caves and Other Features of Interest.

Barlands Quarry Sink	SS576897
Barlands Quarry Pot	SS576896
Kittle Hill caves	SS576895
The Daw Pits:	
Higher Daw Pit	SS576893
Gwynspar Pit	SS576891
Lower Daw Pit	SS575891
Gulver Pit	SS574888

#### Barlands Quarry Sink.

The river sinks where it runs off the moor in several places amongst a jumble of boulders. There does not seem to be any one particular spot for the main drainage, but some locals have recently dug out a few boulders to ease flooding conditions further downstream.

#### Barlands Quarry Pot.

Situated above the level of the stream near the entrance to the quarry the cave is thickly covered in dust and oil. A 20 foot drop leads to a passage which contains a stream disappearing into boulders. This stream is probably part of the water sinking at the sink.

#### Kittle Hill Caves.

Some small entrances on the roadside probably revealed when the road was built. Several interconnect but are all very small - there is a lot of moonmilk and spiders there.

#### Higher Daw Pit.

This is a large collapse on private land; it contains several interesting features:

Point A. A rather nasty climb down through boulders of 17 ft. brings one to a tight squeeze; after passing this obstruction a further descent of 11 ft. and one then enters a small passage that is blocked at one end by boulders, but a way on is offered by passing yet another squeeze which

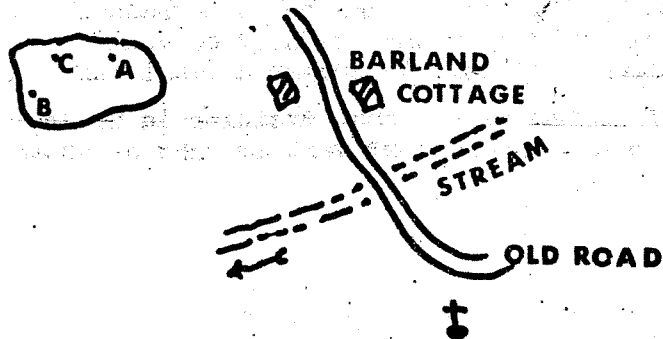


FIG 4

brings one into a passage about 60 ft. long x 4 ft. wide x 5-6 ft. high, containing water up to 5 ft. deep. One end of the passage terminates in a sump whilst the other is several narrow rifts that have small streams flowing down them.

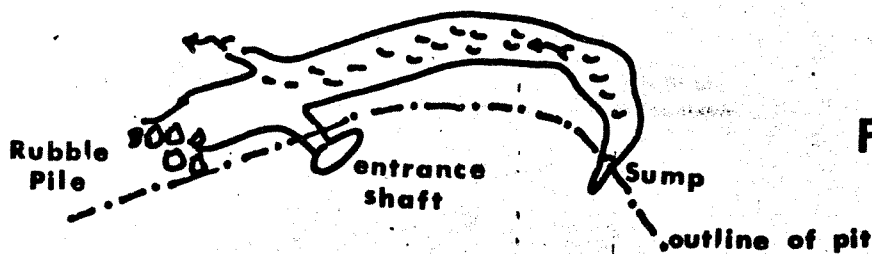


FIG 5

When there has been considerable rainfall, it has been observed that water will rise out of the above mentioned cave, and sink at Point B. An attempt has been made to excavate this site, but unless one is prepared to carry out the digging operations on a major scale it will be a more or less hopeless task.

Point C is a small cave 15 ft. above the bottom of the pit. The far end of it is blocked by mud and calciteflow; it appears to be a haunt for bats.

#### Gwynspar Pit.

This large collapse on the opposite side of the valley has very little of interest in it, although I'm told that access can be gained to a water filled passage, by going through the boulders at the bottom. A rope is useful to help one descend.

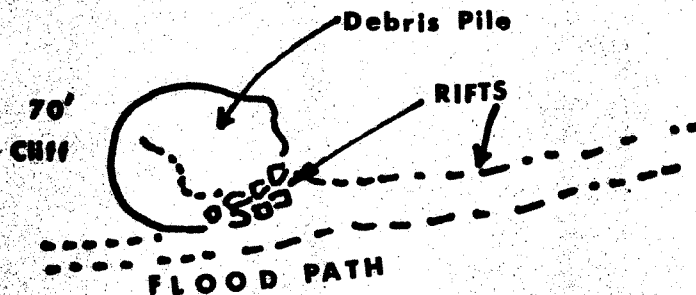
#### Lower Daw Pit.

This is by far the largest of the four pits, and contains numerous small passages all of which soon become impassable due to size of boulders.

Technically it is the main sink in the valley, but the stream

often doesn't reach this far because it has gone underground at Barlands Quarry Sink, and the other small sinks below Barlands. When there is a really heavy flow in the stream the drainage capabilities of this pit are almost exceeded causing the hole to become a small lake.

This site is one of the most exciting in Gower, but where to dig is very debatable, and would require vast amounts of shuttering.



**FIG 6**

Gulver Pit.

This is the smallest of the Pits; it has a rather interesting overhanging roof, and collection of animal bones (recent variety). There is no water to be seen in it, and it is very difficult to see an obvious way on through the boulder strewn floor. Some persons suggest that the place is an old mine, but this is doubtful.

Besides the well known Kittle Hill Caves and Barlands Pet, there exist in the valley the following caves and fissures:-

- |           |                       |
|-----------|-----------------------|
| SS 576892 | An abandoned Rising.  |
| SS 575890 | Two Caves.            |
| SS 574887 | Guzzel Hole.          |
| SS 574886 | Abandoned Mine Level. |
| SS 574883 | Cave.                 |
| SS 567879 | Widegate Rising.      |
| SS 568879 | Rising.               |
| SS 576880 | Sink.                 |
| SS 573881 | Rising.               |

Abandoned Rising.

This rising is a bit of an odd man out, being situated at the head of the valley between the Higher Daw Pit and Gwynspar Pit, in the valley floor about 30 ft. east of the stream bed. Several choked rifts that look diggable are to be found at this site.

### Two Caves.

Situated on the East side of the valley not far below the Lower Daw Pit, they are within 70 ft. of each other and probably connect; both are blocked by mud, the lower of the two has been dug for approx. 70 ft. The passage is of fair proportions and getting bigger. The dig was started by persons unknown who abandoned it. Some friends and myself started to redig it during early '64, and we hoped to be able to continue the digging operations.

### Guzzel Hole. Total Length 150 ft.

This large entrance gives access to the underground stream in the valley, the entrance passage soon becomes sumped; this can be free dived or by-passed by taking a side passage, which gives access to some extremely muddy and wet bedding-plane chambers that are terminated by another sump that could possibly be dived.

Downstream in the cave is quickly terminated by rubble choked rifts; these are incapable of taking a heavy flow of water, as under flood conditions the stream will flow out of the cave entrance and follow a surface route to the resurgence. The quantity of water that can resurge from Guzzel Hole is enormous; this does suggest a good possibility that the sumps may be of sufficient size to be passed by divers into the system that must lay beyond.

A small cave to the left of Guzzel Hole is of little interest; it soon becomes blocked by flowstone, from which point the stream can be heard. It seems to connect to the chambers beyond the Entrance Sump.

### Abandoned Mine Level.

There are various rumours regarding the length of this mine; some state that it extends as far as Caswell Bay, others to Brandy Cove. There is also considerable doubt as to when the place was worked, and what non-ferrous ore was mined. Its present length is only about 100 ft., the end being a run-in chamber; if more could be found out about this site it may be well worth digging, and even if it isn't as extensive as rumours suggest (the Spoil heaps are small) the old workings may run into a cave system.

The Brandy Cove end is supposed to come out in one of the Barns in Lower Hareslade Farm.

### Cave SS 574883.

Is situated on the West side of the valley, approximately half way up the valley side. It is a rift going down dip for about 25 ft., the way on being choked by mud.

### Widegate Rising. SS 567879.

In times of flood a fair volume of water issues from a fissure at the base of a small outcrop. There is a steep dry valley behind it, and it may be worth excavating.

### Rising. SS 568879.

This is a rising at the level of the stream and is virtually impossible to locate except in drought. It is just under the West bank near the path.

Rising. SS 573881.

Another small rising noticeable only in flood conditions. The water coming out here probably originates from the sink at SS 573881. The rising is at the bottom of a noticeable dry valley running from the sink to the river.

Sink. SS 576880.

A small amount of water trickles into a little sinkhole by the roadside. The water originates from a nearby spring that used to be Pyle Well.

(iii) THE DRAINAGE SYSTEM OF GREEN CWM.

During the past couple of years, I have spent many weekends studying the underground water flow of the above mentioned district, the result of which I have outlined below.

The main features of interest in Green Cwm are:-

LLETHRID SWALLET	NGR Sheet No. 22	531912.
TOOTH CAVE	" " " "	531909.
A WELL	" " " "	534902.
WELLHEAD RESURGENCE	" " " "	539898.

LLETHRID SWALLET.

This sink drains nearby PENGWERN COMMON, the amount of water sinking can be up to 40 million gallons a day; the average flow however is in the order of 1 M.G.D.

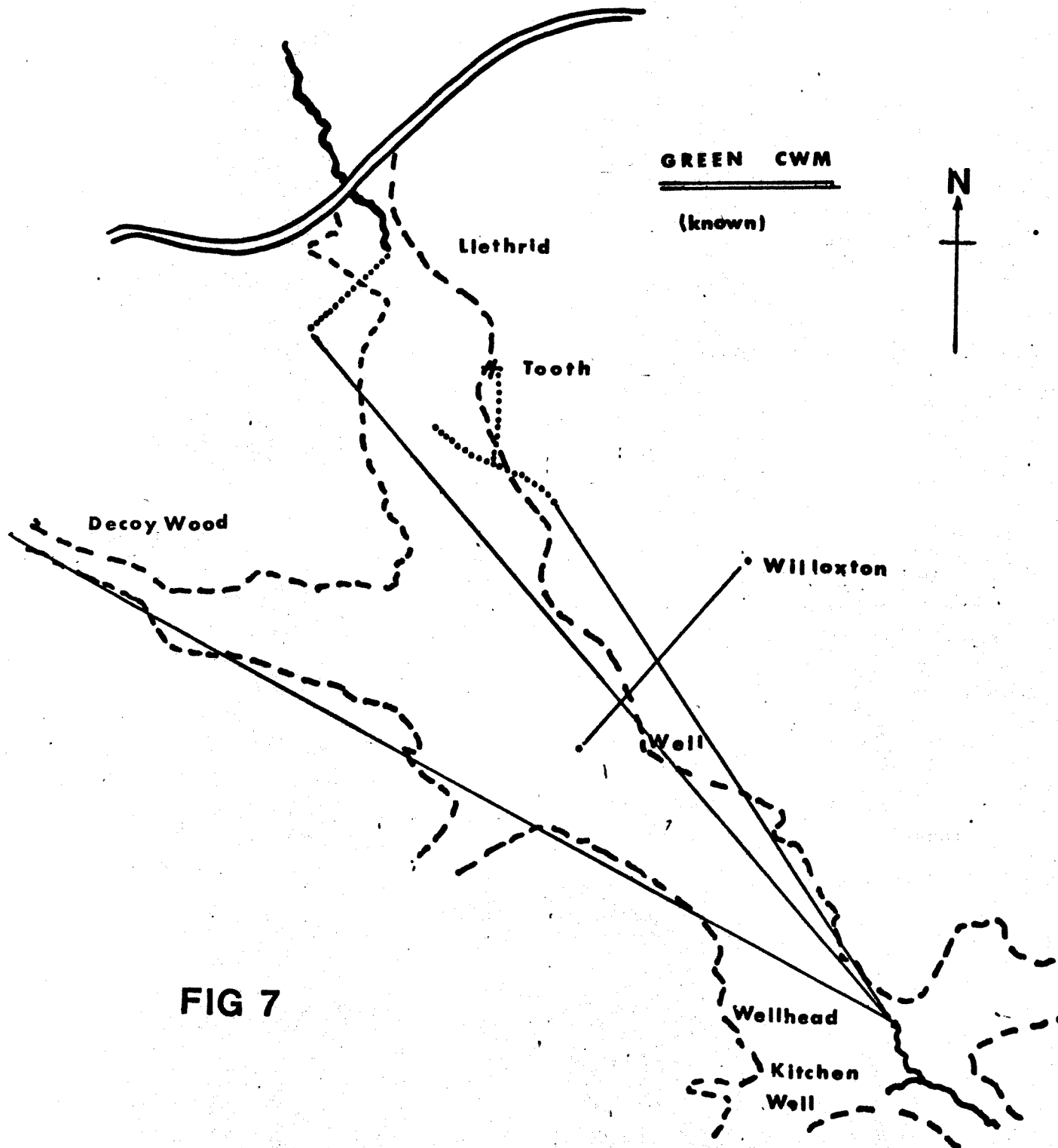
Upon entering the cave the stream can be followed to one of several points; it is dependant upon the volume of water as to where the stream finally sinks within the cave.

Under normal conditions the stream either sinks down narrow cracks in the Entrance Series, or it may sink in the second Rift Passage, reappear in the Sump Passage, and finally disappear down a narrow crack just beyond Sump One.

When semi-flood conditions prevail there is sufficient water flowing to enable the stream to flow the complete length of Sump Passage, to sink in the Final Sump, Sump 4.

During flood conditions the volume of water is so great that the water builds up from Sump 4 causing the Sump Passage to flood, the build-up of water continues until it reaches the level of the base of the formation in the Great Hall known as the Mushroom. When these conditions exist within





**FIG 7**

the cave it is obvious that the Clague Series, and the Entrance Series, both of which are below the level of the Great Hall, are also flooded. By this time the surface stream would have risen to a height of 11 ft. above the stream bed at the entrance, flooding the field to a depth of 4-5 ft., and the excess water flowing down the valley sinking in numerous small sinks between Llethrid and Tooth Cave entrance, although on rare occasions there is sufficient excess water to cause the stream to flow as far as the old gamekeeper's cottage (NGR SS 534902). I have seen the amount of water sinking at the swallet rise enough in 20 minutes to make an exit from the cave completely impossible, so I advise any intending visitor to watch the weather very carefully. Dye placed in Llethrid stream during semi-flood conditions was seen 20 hours later at Wellhead, while attempts under normal conditions yielded negative results.

#### TOOTH CAVE.

This is the longest cave on Gower, the entrance leads to a finely decorated chamber (Bone Chamber); this is followed by a series of rifts and low crawls, until one enters Razor Passage. This passage in turn leads to Main Stream Passage.

Two streams flow in the cave - (a) RAZOR PASSAGE STREAM, (b) MAIN STREAM, both under flood conditions only.

#### (a) Razor Passage and Stream.

This passage runs for 500 ft. in a N-S direction, it varies considerably in size; there are sections where you can walk comfortably but they are frequently broken by numerous short crawls and squeezes.

When a stream flows down this passage many sumps are formed, making it impossible to follow it. Like the Main Stream, Razor Passage Stream only flows in very wet weather, and because Razor Stream always flows first cutting off access to Main Stream, the Main Stream has therefore never been seen by cavers.\*

Razor Stream rises from a narrow rift at the Northerly end of the passage, and flows along it until it joins the Main Stream via some narrow rifts that lead off just before the Junction. Where it originates from is doubtful. I have tested it for a connection with Llethrid stream but this proved negative, as there are no other possible sinks in the area and due to the lack of vegetation to be found in the stream, the conclusion that I come to regarding its origin is that the water does not come from a definite surface sink, but from general drainage of the surrounding land.

#### Main Stream Passage and Stream.

This passage with a length of approximately 2000 ft., is the longest to be found on Gower; it is also the biggest, a reasonable estimation of its average size being 10-12 ft. wide x 8-10 ft. high. The general

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\* (Editor's Note: M. Coburn has reported being in Mainstream Passage while there was a small water flow from a large lake near Top Sump. Although he did not realise it at the time, he must be the only person to have actually seen the Top Sump overflowing, and was fortunate not to have been trapped.)

direction of this passage is N.W. - S.E., its upstream extremity is Pot Sump, whilst the other end terminates in the Final Sump. 850 ft. from Pot Sump there has been a collapse of the passage roof. A climb through the boulders brings one into a very muddy passage, this is the Aven Series. It is here that the emergency rations are stored, also it is interesting to note that the presence of this series is marked by a large surface depression at N.G.R. 532907. Back in the Main Passage just beyond the boulders is the Big Sump, this sump often dries up, but when full it becomes impossible to pass due to its length, thereby cutting off access to the fine section of cave beyond leading to the Final Sump.

#### The Main Stream.

Rises from Pot Sump which as its name suggests is at the bottom of a 15 ft. pot, and after several ups and downs it finally flows down Main Stream Passage to sink into the rifts forming the Final Sump.

The volume of water that flows along this passage is tremendous, it completely fills sections of passage 12 ft. x 8 ft., and this is not static water - leaves wrapped around stalactites confirm this fact. A noticeable feature to be found in this passage, as in the Sump Passage in Llethrid, are the channels cut in the mud by the streams; it appears that the streams have only recently (geologically speaking) invaded these fossilized systems.

#### The Well behind the Gamekeeper's Lodge. N.G.R. 534902.

This well was sunk between June and December 1921 and is rather interesting due to the following facts.

When it was sunk a stream some twelve feet deep was found in a passage 2 ft. wide with a foot of airspace. The water was flowing very slowly and there was a strong draught.

From the moment of breaking through to the water at a depth of 82 ft. two interesting things happened.

1. The water immediately rose 35 ft. up the well and after a short while sank to its original level of -82 ft.
2. A few years ago the water in the well disappeared and has not been seen since. Subsequently, some 20 ft. of rubbish has been thrown down the well completely sealing off the passage, and digging attempts are almost impossible due to the small dimensions of the well near the bottom.

Several people have told me that water can be heard flowing in the well when there has been heavy rain, but this has not been my experience although I have been to the bottom during such conditions.

It is very difficult to offer any explanation to the water rise of 35 ft. when the well was sunk; any suggestions would be very welcome. The disappearance of the water could be caused by the stream finding an alternative passage along which to flow - this being a common occurrence in Gower.

The water-course was originally found by a diviner who followed an underground stream from the direction of Willoxton Farm to Green Cwm.

The above information was given to me by one of the men who sunk this very fine example of a brick-lined well.

## WELLHEAD RESURGENCE.

Wellhead water has been used as a source of power by the nearby sawmill for 700 years. The local Water Board built a pumping station at the resurgence during the late 40's, to give a large area of Gower a reliable water supply.

The resurgence consists of several springs, the stream from which has been dammed to form a weir; water is pumped from the weir into the station where it is filtered and chlorinated before being pumped 500 ft. to the top of Cefn Bryn, into the storage reservoir, to give it the necessary head for distribution.

The springs have never been known to dry up; the amount of water rising can be from 673,300 gallons a day up to 40 million gallons a day.

Before the station was built the Water Board carried out extensive investigations to establish the source. They put dye in Llethrid but this yielded a negative result, so they came to the following conclusions:-

1. Microscopic examination of the sediment revealed that some of the water must be coming from outside Gower, the most likely place being an area above Ammanford, from where it follows the North Outcrop under the Burry Estuary to resurge at Wellhead.
2. General drainage of the surrounding land.

I have since proved that Llethrid does in fact rise at Wellhead, and I also suspect that Decoy Pond Sink also rises there. When it is in flood the water shoots out of the springs under great pressure, forming mushroom shaped foundains 3 ft. high, and during a drought when Llethrid and the surrounding land are dry a minimum of 680,000 gallons a day still flow at Wellhead. This water is what is coming from Ammanford way.

These are the four main features of interest in Green Cwm. I shall now put forward what relationship they have to each other.

On Fig. 7 are plotted the following known underground water courses:

- a. Llethrid sink to Sump 4, where the water sinks in times of flood.
- b. Pot Sump in Tooth Cave, where the water rises during flood conditions, to the Big Sump. At the moment, the Main Stream Passage in Tooth Cave has been surveyed only as far as the Big Sump; situated about 1500 ft. in a southerly direction from the Big Sump is the Final Sump; the course of the stream between these sumps is not shown.
- c. The stream in the well, flowing from the Willoxton area. \*

The following proven water connections are shown.

- a. Llethrid Sump 4 to Wellhead Rising.
- b. Big Sump Tooth Cave to Wellhead Rising.

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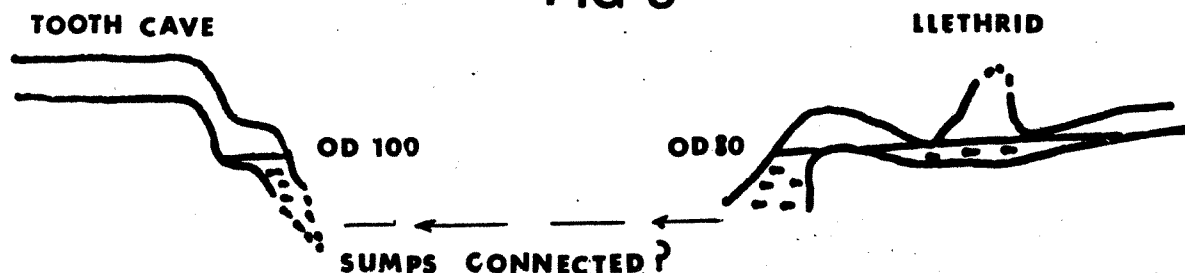
\* In the last century a stream sank into a cave at Willoxton, but it was filled in by the farmer. Today there is a big depression often filled by a muddy pool near Willoxton Farm. A small cave near the depression has been dug without success.

The big question to be answered and proved on this map is where does the Main Stream in Tooth Cave originate from? I think it is safe to assume that it comes from Llethrid; this theory is supported by the following facts:-

1. The vegetation to be found in the Main Stream reveals that the water is coming from a definite local sink, not from general drainage; identical vegetation is to be found in the Llethrid stream.
2. Llethrid Swallet is the only local sink large enough to supply the enormous quantities of water that flow in Tooth Cave.

Because Tooth Cave Main Stream only flows during flood conditions, this suggests that the Llethrid stream after passing into Sump 4, flows along a passage (possibly phreatic) until a constriction is met. During normal conditions the water will pass this constriction but when the stream is in flood, the constriction causes the water to build up behind it, flooding the Sump Passage; this build-up of water in Llethrid is so great that it will cover the Mud Flats in the Great Hall. So Llethrid is flooded and a hydrostatic head of up to 35 ft. exists at Sump 4. We have assumed that Tooth Cave Main Stream comes from Llethrid, and because there is no known connecting passage in Llethrid, the connection must be beyond Sump 4. The hydrostatic head to be found at this sump will raise the water in Pet Sump the 15 ft. necessary to cause it to flow along Main Stream Passage.

FIG 8



Referring to Fig. 7 again, we know that the line representing the proven water connection between the Big Sump and Wellhead Rising can be modified because it is known that the stream flows as stated previously in a Southernly direction, from the big sump to the Final Sump.

It seems very unlikely that the stream flowing from the Willoxton area to the Well is going to resurge at any other place than Wellhead, and because the Tooth Cave stream is the main water course in the valley, it is safe to assume that it connects with it at a point not far S.W. of the Well. A water course can therefore be drawn from the Final Sump to the area of

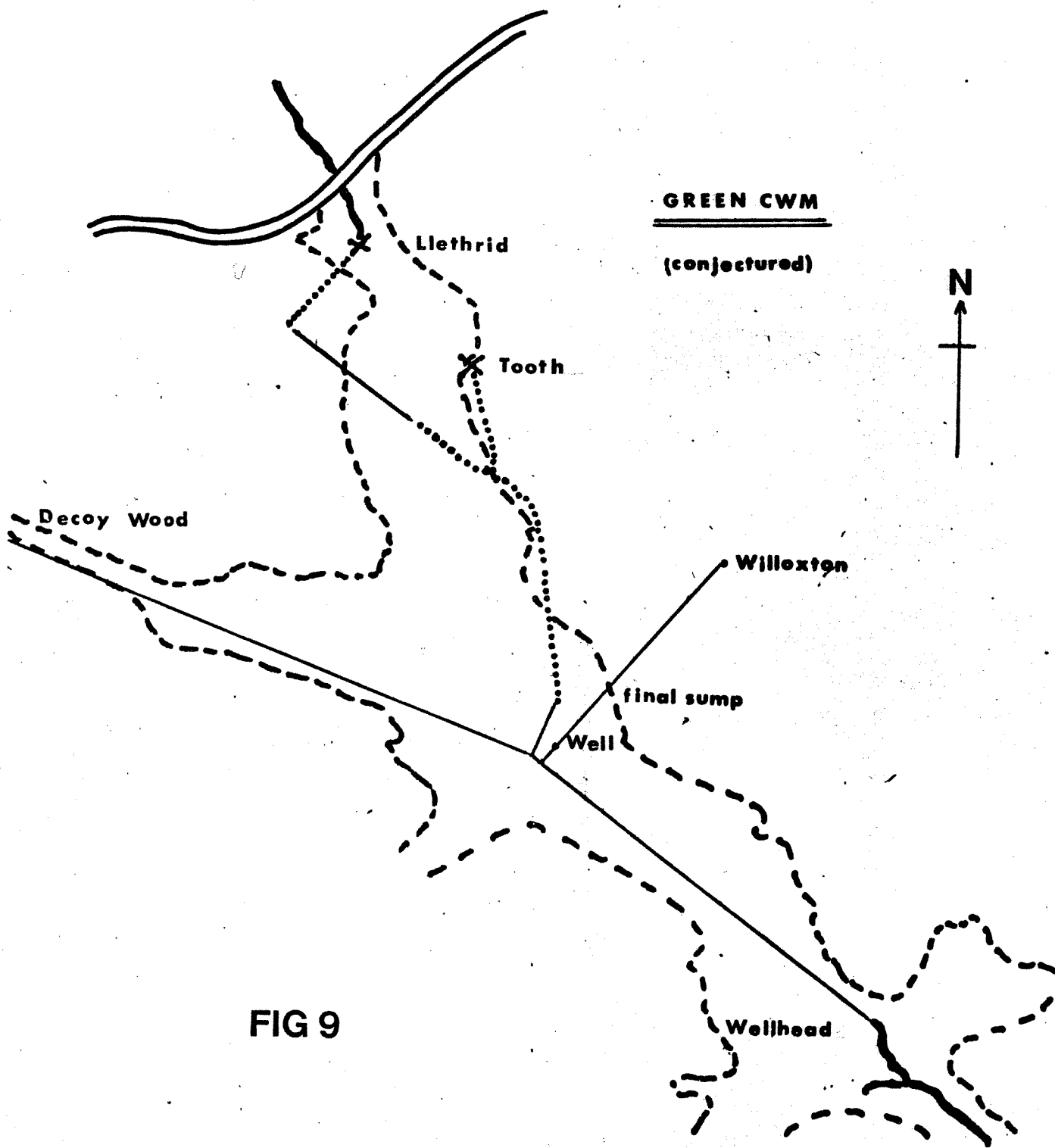


FIG 9

the Well, from where it flows to Wellhead. Fig. 9 shows these revisions, which I believe give an accurate picture of water flow in the valley during flood conditions.

When there has been exceptional rainfall, the stream sinking at Llethrid will be of too great a volume to freely pass the constriction in the Entrance Series of the cave; this results in the water building up to a depth of 8 ft. above the entrance of the cave, at which point the water overflows the stream banks. Flooding of the adjoining field occurs, and the excess water sinks in one or all of the following places, depending on the flow.

- A. Down numerous small sinks between Llethrid Swallet and the first gate in the Gwm, the water probably finding its way back into the cave (Llethrid) via the Clague Series.
- B. When these sinks prove inadequate the water will flow across the path near the gate and sink in a depression approximately 200 ft. North of Tooth Cave entrance. This water may be that to be seen in a small stream passage, at the bottom of a narrow rift in the Bone Chamber Tooth Cave. (This rift was filled in during the archaeological dig.)
- C. During very exceptional circumstances, the stream is large enough to overflow this sink, and flow down the Gwm sinking at numerous small sinks between the above mentioned sink and Green Gwm Cottage.

Under such conditions it should be noted that the sink known as Llethrid No. 2, which is situated 150 ft. upstream from the main sink, becomes active and drains a lot of the stream back into the cave via the First Rift Passage.

#### NOTES.

1. Near Parc le Breos Riding School there is an intermittent sink reported and indeed where the dry valley joins Green Gwm near the waterworks there is a small spring by the roadside which may be drainage from this area (Kitchen Well).
2. It has since been proved that water sinking at Decoy Pond Sink also rises at Wellhead, this gives the resurgence the largest catchment area of all the Gower risings.

The Decoy water after sinking probably follows the course of the dry valley to join the main underground drainage passages of Green Gwm in the area of the Final Sump in Tooth Cave.

#### (iv) ILSTON VALLEY.

The Ilston Stream drains Pengwern and Fairwood Commons. There is very little evidence of any cave system existing in the valley; there are several places where one could dig but until the more interesting sites elsewhere such as Decoy Pond have been excavated, under-developed areas

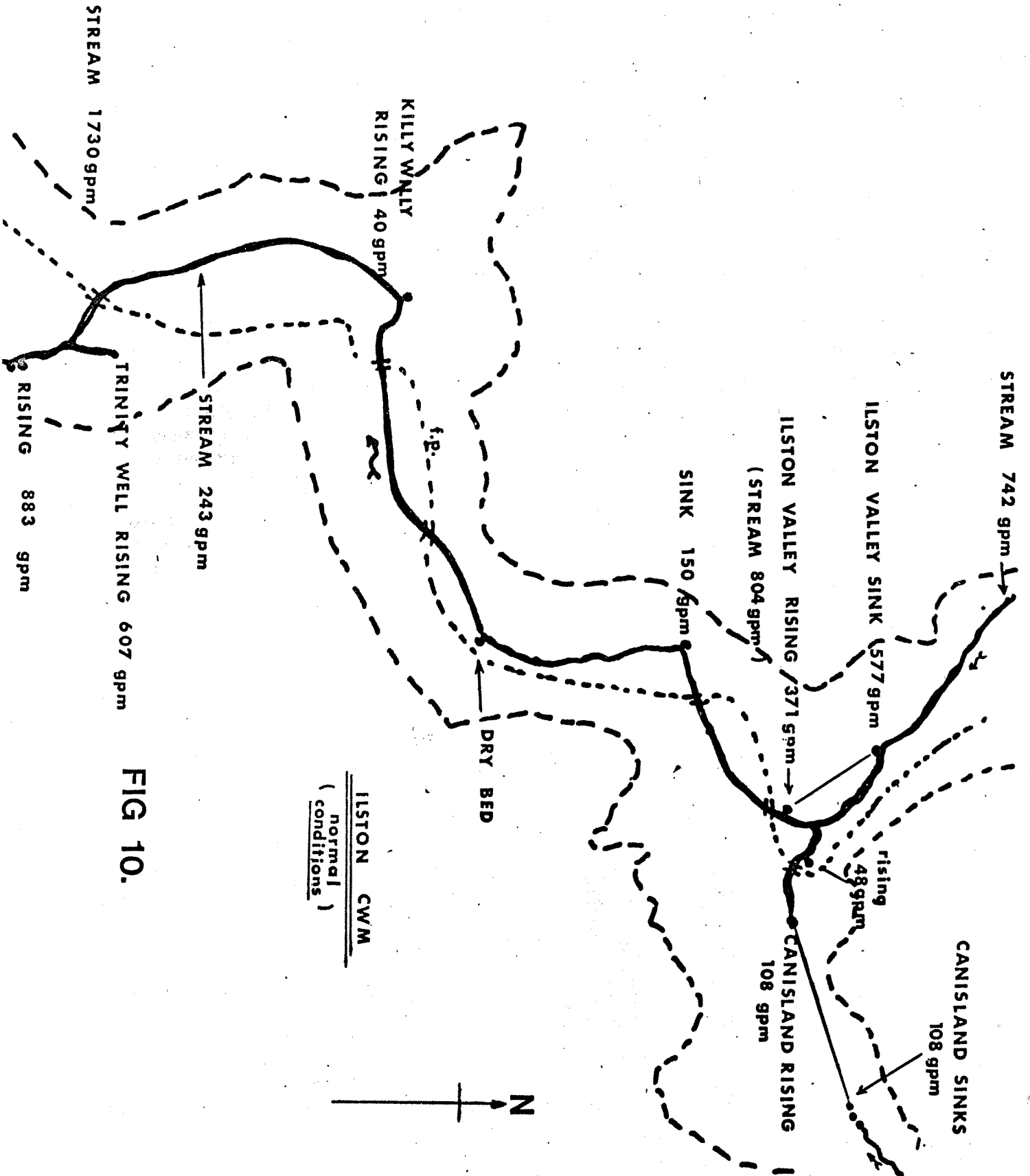


FIG 10.



such as Ilston are best left alone. The Taylors and many others have dug out most of Ilston Cwm Cave without much success.

It is dependent upon the amount of water flowing in stream just how far down the valley it will flow before sinking. It should be pointed out that most of the water sinking does so by way of unknown rifts in the stream bed, rather than down definite holes. Fig. 10 shows all the known features of interest in the valley; as can be seen by the flow rates, the stream gradually disappears until it is lost completely near point A on the map. The water reappears down the valley, again from no definite rising, but from the stream bed in the section between Killy Willy rising.

The rising known as Trinity Well is believed to be the resurgence for the water sinking near point A.

At the head of the valley it can be seen that two short water connections have been proved. The Canisland Valley connection has the greater flow rate of the two, but even this is limited to about 250 gallons a minute after which the excess water flows overland down the valley.

Further information on the sinks and risings in Ilston and Canisland Valleys can be found in the sinks and risings section of this article.

It should be noted that the figures given on the map are for one set of conditions, and that these can vary considerably; during flooded conditions a surface stream exists throughout the valley, on the other hand a drought will cause the stream to sink near Sink A, causing the stream bed to be dry until the water flowing from Trinity Well flows into it.

#### (v) OTHER AREAS.

##### (a) Caswell Valley.

This dry valley stretches from Clyne Common to the sea at Caswell Bay and although speleologically underdeveloped has several hydrological features.

#### SINKS

SS 589889	Near Murton Green
SS 597888	Near Espalons Hill
SS 598886	Near Newton

#### RISINGS

SS 594877	Near St. John Hut
SS 594876	On Foreshore near old Pumphouse (East Rising)
SS 590876	Under old blockhouse (West Rising)
SS 589876	From base of cliff.

The Sinks take only trickles of water normally but in flood times the volume of water can be considerable. The one near Murton Green is the farthest away from the risings and is a flat, shallow depression filled with dead trees and domestic rubbish. It would be difficult to find a digging spot.

Farther East a stream sinks near Espalone Hill after draining part of Clyne Common. The Sink is a large well-formed collapse with an inviting cliff. The water sinks before it reaches the cliff normally, but in wet weather it pours into a large excavated opening in the cliff. Attempts to dig here have been thwarted by the amount of mud fill.

The third sink farther east still is merely a large shallow depression with a small trickle from Clyne Common and offers no digging prospects.

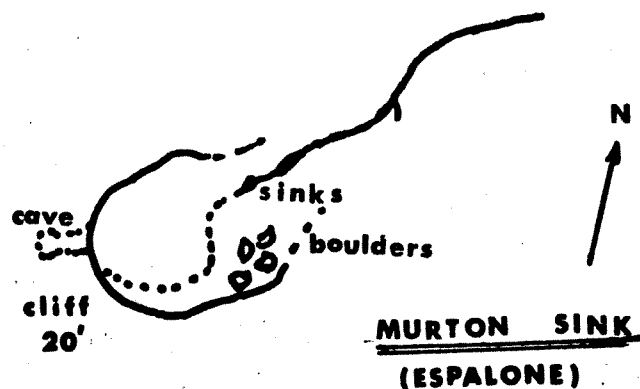


FIG 11

There are two risings on the beach at Caswell that never dry up; both emerge from minute cracks in the rock. Before the area was heavily inhabited the water supply came from these springs and the remains of the pumphouses are still intact.

At SS 594877 there is a hole at the base of the hillside; in drought it is possible to squeeze for about 20 feet into a very tight passage. In flood up to 3000 galls/min. can issue from it.

At SS 589876 there is a rift on the cliff that was excavated by the Taylors until it collapsed just as a cave was found. In flood, water issues from below the fissure - up to 600 galls/min. The water from the sinks has all been traced to the Caswell Risings, details are given in Fig.11.

(b) The Freedown Sinks to Staffel Hagger Wet Weather Connection.

The collection of sinks at Freedown to be found at SS 493913 are only active during very wet weather when they drain central Cefn Bryn and act

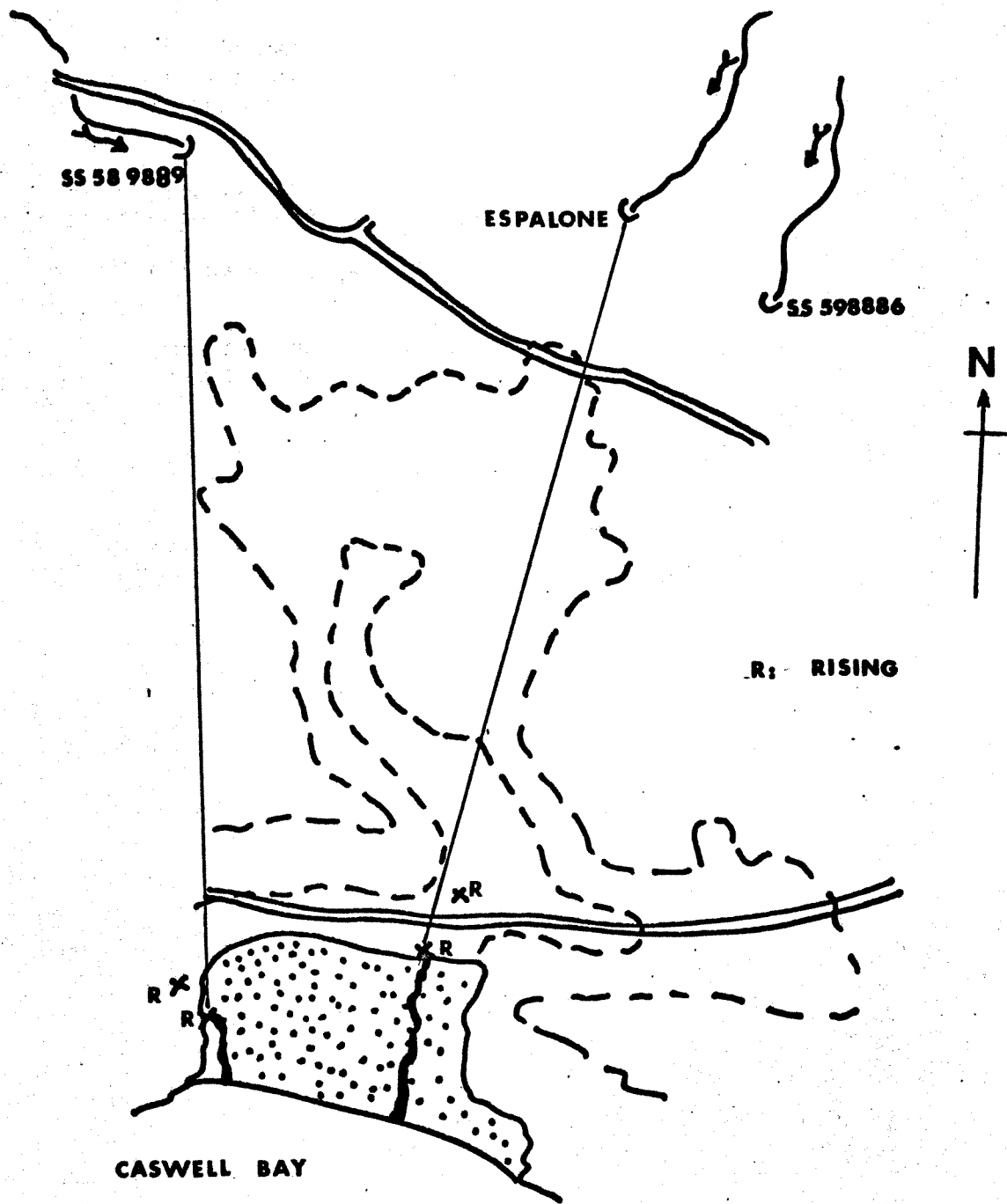


FIG 12.

as an overflow for Stoneyford. Like Stoneyford the actual sinks are of little interest, consisting of small muddy depressions.

Staffel Hagger. SS 492924.

Near Staffel Hagger is to be found Tree Cavern, from where issues a strong flow during wet conditions; this is thought to be the resurgence for the Freedown, and the following facts support this theory.

1. There are two good reasons against Llanriddian Rising being the resurgence: (A) The total flow of this rising is accounted for by water from the Moor Mills and Stoneyford sinks, and (B) to rise here it would be flowing underground against the strike.
2. Leason Well that has a large unaccounted for flow is a possible resurgence, but Tree Cavern seems to be a more feasible place.
3. Local rumour (although not to be relied on) states that Tree Cavern is the place.

Should this be incorrect, the only way to account for the Tree Cavern flow is to assume it is due to general seepage off Cefn Bryn during flood conditions.

It is impractical to do a dye test on this system due to the local farms using it as a water supply.

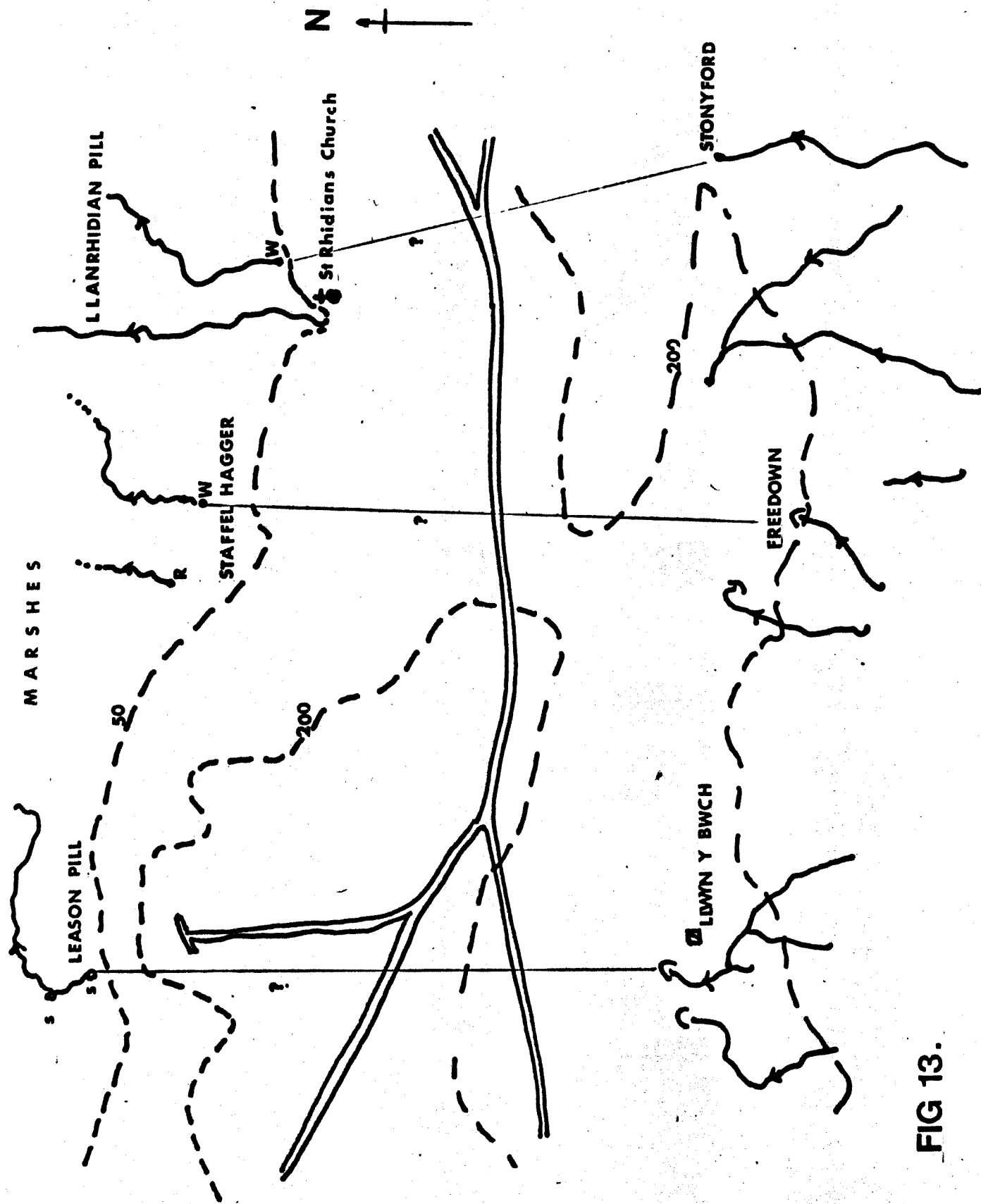


FIG 13.

